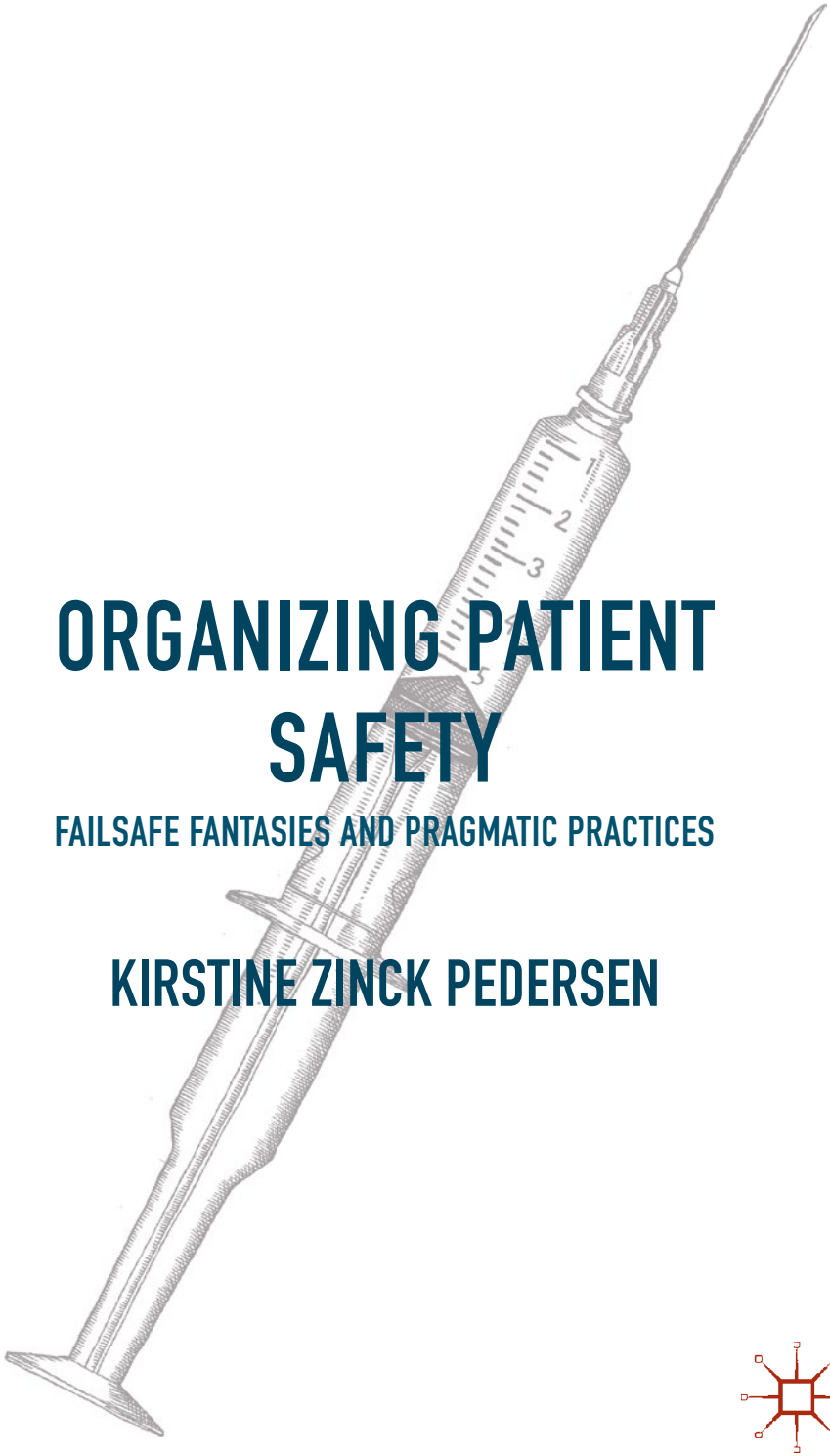
HEALTH, TECHNOLOGY AND SOCIETY



ORGANIZING PATIENT SAFETY

FAILSAFE FANTASIES AND PRAGMATIC PRACTICES

KIRSTINE ZINCK PEDERSEN

Health, Technology and Society

Series editors
Andrew Webster
Department of Sociology
University of York
York, United Kingdom

Sally Wyatt
Faculty of Arts and Social Sciences
Maastricht University
Maastricht, The Netherlands

Medicine, health care, and the wider social meaning and management of health are undergoing major changes. In part this reflects developments in science and technology, which enable new forms of diagnosis, treatment and delivery of health care. It also reflects changes in the locus of care and the social management of health. Locating technical developments in wider socio-economic and political processes, each book in the series discusses and critiques recent developments in health technologies in specific areas, drawing on a range of analyses provided by the social sciences. Some have a more theoretical focus, some a more applied focus but all draw on recent research by the authors. The series also looks toward the medium term in anticipating the likely configurations of health in advanced industrial society and does so comparatively, through exploring the globalization and internationalization of health.

More information about this series at
http://www.springer.com/series/14875

Kirstine Zinck Pedersen

Organizing Patient Safety

Failsafe Fantasies and Pragmatic Practices

palgrave
macmillan

Kirstine Zinck Pedersen
Department of Organization
Copenhagen Business School
Frederiksberg C, Denmark

Health, Technology and Society
ISBN 978-1-137-53785-0 ISBN 978-1-137-53786-7 (eBook)
https://doi.org/10.1057/978-1-137-53786-7

Library of Congress Control Number: 2017947186

Cover illustration: mecaleha/getty images

Printed on acid-free paper

This Palgrave Macmillan imprint is published by Springer Nature
The registered company is Macmillan Publishers Ltd.
The registered company address is: The Campus, 4 Crinan Street, London, N1 9XW, United Kingdom

In the memory of my mother Helle Zinck Østergaard (1955–2013)

Preface

On a summer day in 2011 I received a phone call from my mother. Because of acute stomach pain she had been hospitalized the day before and already on that first night they had found a large cancer tumour in the colon that had spread to the liver. I asked her if she was going to make it—and she said 'no, I don't think so'. She was right; the cancer turned out to be incurable. After putting up a fight that even the oncologists had rarely witnessed, and after surviving for much longer than—I came to learn later—they had imagined possible, she died in April 2013 at the age of 57. At the time of the phone call I was in the middle of writing my PhD thesis on the topic of patient safety. As it would turn out, my mother's situation provided me with a much unwelcome insight into, and closeness with, issues of patient safety, medical errors and critical incidents from the perspective of the patient.

Although I am generally convinced that my mother received competent and good care in her almost two-year encounter with the Danish healthcare system, she also experienced a number of questionable incidents connected to the safety and quality of her treatment. These were incidents ranging from communication problems, logistic issues, long waiting times, lack of information, an instance of mistreatment resulting in chronic pain, some episodes of poor professional judgement and at least one possible case of negligence. Some of these 'incidents' could possibly have changed her destiny, as when my mother's general practitioner

on several occasions and during several months ignored her mentioning of significant symptoms, as well as her tainted family history, until that summer's day when my mother, on her own initiative, demanded to be hospitalized. Other incidents had no, little or only momentary effects on her physical health and treatment, but had other types of consequences. The one I have chosen to disclose here is one of these—in the bigger picture—minor incidents and it happened on the very night she got hospitalized. My dad was away on business travel and that is why my mother went to the hospital by herself. While she was in her hospital bed, in a shared room with tree other patients, the surgeon who had viewed her initial scan images chose to disclose the devastating news: she had cancer and would probably not survive it but, if she was lucky, she might live for five more years. The clumsy surgeon might have thought he did her a favour by adding approximately four years to the prognosis that the spotted liver suggested. But to my mother this death sentence came out of the blue. Although she must have thought of cancer as a distant and unlikely possibility for her stomach pain, she was in no way prepared for this shock. And, unfortunately, the clumsy handling of my mother that night did not stop there. After having disclosed the preliminary diagnosis, it was decided that she should be transferred to another hospital and she was consequently sent there by taxi, alone, late in the evening, dropped by the taxi driver at an old and at the time closed entrance to the hospital and left to walk around disorientated in the dark to find her own way in.

I often think about the horror my mother must have experienced that evening. Being in her mid-fifties, healthy and vigorous, living an active, energetic and 'full' life with a physically demanding job—and then from one second to the other everything was swept away under her. How this message is delivered, when, where, with whom and by whom—what Glaser and Strauss have called the awareness context (1968)—is anything but irrelevant. And I believe that the brutality of the way my mother came to learn about her destiny became a leading cause for the distrust and aversion she often felt towards the doctors who treated her throughout her illness. So, although the incident, in the bigger picture, seems small or even insignificant, it was not. At least not to my mother and not to us, her relatives.

Calling the health professionals' handling of my mother's case that night 'clumsy' is perhaps an understatement, but it also attests to the

difficulty of defining patient safety and medical error. Often critical incidents are defined as those incidents that, unrelated to the illness, lead or potentially lead to patient harm, but my mother was not harmed—not physically at least. At the same time, the incident demonstrated both breach of protocols and practices for delivering news of this kind and a disturbing lack of prudence and thoughtfulness on the part of the surgeon and those who made the decision to transfer her. Judged from this perspective the handling of my mother that evening was below standard both officially (in terms of adherence to guidelines) and ethically (in terms of the moral conduct of the health professionals).

With the term 'clumsy' I also seek to indicate that the 'wrongness' of the incident was, in all likelihood, not intentional. And it is also, at least in hindsight, impossible to point to a particular reason for the misjudgements. 'Critical incidents' like this are often characterized by the heterogeneous nature and the multiple reasons for their occurrence. Frequently they can somehow be related to a lack of resources like manpower, time, money, space and equipment; some incidents are systemic, that is, they are due to the interaction of system components, which could not necessarily have been foreseen (Perrow 1984); some are due to so-called human factors such as stress, fatigue and inattention (Reason 1990). Certain incidents are due to deviant practices and routines, which have become normalized (Vaughan 1996). Others again are instances of mistaken decisions, that is, reflective and competent decisions that later turn out to be wrong (Paget 1988). And some are due to incompetence, inexperience, negligence and a few to unfitness due to, for instance, age and addiction (Rosenthal 1995). Finally, many are mixtures of some of the above features, and most are difficult to even define, categorize and manage.

It is evident that anyone who, like my mother, has a long and intensive acquaintance with the healthcare system is likely to experience judgemental mistakes, unpleasant incidents, faulty or ineffective communication, coordination problems or medication errors of different sorts. And in much sociologically inclined literature on medical practice it is common knowledge that errors and critical incidents are to some extent inevitable or even normal, which has to do with the inherently uncertain, situated and time-dependent character of medical work and the complexity of the

organization of healthcare. Importantly, however, all the issues listed do not exempt us from trying to do things better. The question here, then, is not if but how.

For more than two decades, the 'how' of patient safety has been answered in the form of system optimization, system reengineering and systems thinking in various disguises. Within mainstream patient safety policy, literature and practice, the faith in systems comes with a very particular understanding of humans, healthcare organizations and risks. Based on human factors research, ergonomics and social and cognitive psychology, human errors based on human factors such as inattention, forgetfulness, memory slips, fatigue or stress are said to pose a major threat to patient safety. These physical and mental weaknesses are said to be part of 'the human condition' and thus inevitable in human work (Kohn et al. 2000; Reason 1990, 2000). Therefore, it is argued, patient safety must be handled not by attending to the health professionals and their 'active failures' but rather to the more latent conditions that can be identified in the organization of the healthcare system. The dominant methodologies of patient safety therefore seek to optimize the healthcare system mainly through the introduction of standards, technical solutions, failsafe systems and safety fixes with the hope of preventing errors and thereby protecting patients from the variability of human shortcomings of the health professionals. In order to create these system changes it is necessary to promote a cultural change agenda in healthcare. It is the ambition to create a healthcare system as failsafe as possible by building a learning culture where health professionals disclose, report and respond to incidents, learn to think and enact system optimizations through a blame-free ethos and willingly adopt new safety incentives, procedures and safety systems.

In more recent years, some of the assumptions and methods of this mainstream approach have been questioned by sociological approaches to patient safety as well as by safety engineers and scientists arguing that, for instance, the concepts of human error, culture, systems or the standardization quest of the orthodox approach are either flawed or insufficient. Most of these critiques and alternatives, however, agree to the most central principles of the dominant approach: that patient safety is primarily to be gained by reorganizing health systems rather than by

attending to the training and conduct of health professionals. Thus, both in mainstream and alternative patient safety thinking, the focus has turned from the conduct of the healthcare professionals to the systems in question often with the explicit goal of creating failsafe or ultra-safe healthcare systems that prevent or 'absorb' errors through the development of constantly cleverer system designs.

In this book, I enquire into this 'systemic' answer to the how of patient safety, as well as into the consequences of this particular answer for medical practice and for the conduct, habits and dispositions of health professionals. I consider how the univocal turn to systems via a blame-free ethos has important, and potentially problematic, unintended effects for the organization of medical work, for professional responsibility and, consequently, for the quality and safety of the treatment of patients.

During my research, I have experienced an uneasiness accompanying any critical engagement with the problem of patient safety in its present form because one is quickly seen as questioning an unquestionable good and easily accused of being 'against' the safe treatment of patients in general. Starting on a personal note, I hope to illustrate that the safety and care of patients are very much at the heart of this book. In my mother's case, it is quite simply unrealistic to believe that every incident of misjudgement, incompetence, medication error, communicative inaccuracy or logistic failure could have been prevented by clever system design. It is unrealistic because while humans sometimes fail, so do systems. Organization is never fail-proof. What is more, restructurings are never problem-free. They bring with them redistributions of tasks, responsibilities and risks that do not only lead to safer treatment and care but often cause role confusion, disturbances of well-functioning routines or increased task complexity that can create new types of risks and vulnerabilities. Equally important, too much focus on blame-free systems engineering can prevent the necessary attention towards the conduct, training, habits and judgemental capacities of health professionals which are also, and often especially, needed to secure the safe treatment of patients. It risks neglecting that safety practices in medicine are often based on well-working, thoroughly rehearsed and coordinated teamwork, as well as the experiences, practical judgements, developed habits, trained skills and ethical conduct of health professionals.

Before getting on with this dominant argument of the book it is necessary to establish that while this is not a book that promotes system reengineering as a solution to every problem of healthcare organization, it is also not one that promotes 'the patient perspective' as such an overarching solution. This is a necessary although somewhat controversial point to make because increasing patient experience, patient voice, patient participation, patient empowerment or patient centredness have—together with system optimization—become reflex policy answers to most types of healthcare delivery problems of today (Pedersen and Kjaer 2017). It has since the early 2000s been argued that 'the patient perspective' should play a larger role in patient safety efforts (Vincent and Coulter 2002) and today patients and their relatives are still identified as the most important 'unredeemed resource' in securing their own safety, and therefore patient involvement is described as a major focus area in 'the next wave of patient safety' (IHI 2017).

There is no doubt that listening to patients and their experiences in the organization of healthcare, including them in decision-making whenever appropriate and relevant, and—in certain situations—involving patients and relatives in care, treatment and safety is valuable and to some extent necessary. But involving patients is not a good in and of itself. To illustrate, let us return one last time to the incident of the untimely disclosure of my mother's diagnosis on that summer night in 2011. In a situation like this, patient involvement can become an evil rather than a virtue. Given the current trend of and pressure for 'engaging patients' it is very likely that my mother was asked whether she wanted to know the results of the scans, and later whether she felt up to it for being moved to another hospital. And, for all I know, she would have said yes to both questions without blinking. Needless to say, this does not make the treatment of my mother any less inappropriate or the misjudgements any less grave, but it is possible that 'patient-involvement' strategies might have functioned as direct or indirect justifications for the decisions made. This points towards the patient involvement paradigm's sometimes troubled relationship with accountability and medical expertise, which could easily make for a topic for another book. But it also goes to the core of the arguments of this book because it shows that as any other element of delivering appropriate and safe care, patient participation is an activity that should be thoroughly based on medical expertise; i.e., on training

and skill in knowing how, when and who to involve in what kind of decisions and treatment practices. It is therefore not possible to deal with a situation like that of my mother's from a systemic perspective or from a patient involvement perspective exclusively without discussing the discretionary abilities, communication skills and situational awareness of the health professionals in question, as well as the internal systems for training, securing and checking these necessary skills and dispositions. It might even be appropriate to approach the incident as morally wrong in order to make the implicated health professionals take responsibility and learn from the incident with the hope that they will act to secure the safe and appropriate communication with and handling of patients in the future.

With this in mind, it is not only unwise but also dangerous not to raise more generic questions about how we approach issues of error and safety in healthcare, and not least how the massively coordinated efforts to system-optimize and reengineer health systems affect the conduct and safety dispositions of the health professionals working within these systems. Therefore, it is out of care for patients, and out of respect for situated clinical practices and competent clinicians' safety work, that we need to critically engage with the present formula of patient safety management. If not, healthcare is likely to become unsafe in novel ways.

Acknowledgements

Luckily, researching and book-writing are not solitary jobs. Throughout my research in patient safety and during the writing of this book I have been inspired, supported, provoked, helped, encouraged, criticized and motivated by a whole range of wonderful people. Therefore, I would like to express my deepest gratitude to everyone who has been involved in this project.

The proper place to start my list is with the informants of my empirical studies. Special thanks should go to the hospital centre of the Danish university hospital, where I conducted the most part of the fieldwork to which this book refers. Thanks to those who had me in tow and particularly to the kind quality coordinator who made it happen and who patiently accepted me by her side during her daily safety and quality work.

Next in line for acknowledgements stand Signe Vikkelsø and Paul du Gay who supervised my PhD thesis (Pedersen 2013) on which much of this book is founded though thoroughly reworked, reframed, updated and extended. The two of you were quite a remarkable team and I am truly grateful for your guidance and ongoing commitment. A special thanks to Paul du Gay for engaging in continuous research collaborations on the consequences of public sector reform, the status of public service and the ethics of office. In relation to this ongoing dialogue, this book is only the beginning. Also a huge thanks to my nearest colleagues who are also my friends and who have helped me refine and strengthen my

arguments by reading draft versions of my work and engaging in recurrent and productive discussions. I am especially grateful to Justine Grønbæk Pors, Anne Roelsgaard Obling, Anja Svejgaard Pors, Trine Pallesen, Kathrine Pii, Thomas Lopdrup Hjorth, Susanne Boch Waldorff, Morten Knudsen, Lise Justesen and Dane Pflueger.

I would also like to express my gratitude to all those who have commented on versions of this work at conferences, seminars, reading groups, workshops and research visits. My work has benefitted immensely from discussions with and guidance from Ian Hunter; from Justin Waring's helpful thoughts and advice; and from a constructive and thorough assessment of my PhD thesis by Peter Kjær, Gerry McGivern and Jessica Mesman. A very special acknowledgement must go to Jessica Mesman for inspiration, direction, support, friendship and ongoing collaboration. This book would never have been possible had Jessica not encouraged me to write it in the first place. I am also grateful to Teun Zuiderent-Jerak, Sonja Jerak-Zuiderent and Roland Bal at Institute of Health Policy and Management, Erasmus University Rotterdam, for having me visit. And to Anna Yeatman and Eric Sidoti at the Whitlam Institute, Western Sydney University, for your hospitality and for having done something out of the ordinary to stimulate my thought process.

Acknowledgements should go to my workplace, the Department of Organisation, Copenhagen Business School, for contributing financially, professionally, socially, practically, critically and intellectually to the creation of the book—and to my development as a scholar for the last nine years. I am especially grateful to the members of Centre for Health Management for providing valuable inputs and great discussions and for insisting on the worth of healthcare organization research at a business school. I also thank the Danish Institute for Health Services Research, DSI (now part of The Danish Institute for Local and Regional Government Research, KORA), for also contributing financially to my research in patient safety. And Mette Lundsby Jensen with whom I ventured into the patient safety field through a co-authored report on critical incident reporting in elderly care (Jensen and Pedersen 2010). And I thank *Sociology of Health and Illness* for letting me reuse parts of my article 'Standardization or Resilience? The Paradox of Stability and Change in Patient Safety' (Pedersen 2016) for Chap. 7 of this book.

Last but not least, the most significant 'thank you' goes to my amazing friends and wonderful family, to my mother who I miss every single day, to my father and brother, to my parents-in-law and, most importantly, to Ella, Oscar and Tim for all your love, support, distractions and endurance and for reminding me consistently of what is most important in life.

Contents

List of Figures

Part I

1

Studying Patient Safety: An Introduction

Concern for the safety of patients has always been part of the practice and organization of medicine. The obligation of doctors to consider the risk of intervention and the safety of patients was present in the Hippocratic corpus of writings and has been an integral part of teaching medicine and regulating medical misconduct since antiquity. Today, the well-known axiom 'above all, do no harm' (in Latin *primum non nocere*) is, in spite of its contested origin, understood as a cornerstone in medical codes of conduct. This ethical norm of non-maleficence is taught in medical schools throughout the world not so much as a rigid rule or a fundamental principle, but as a symbol of sound clinical judgement (Brewin 1994) and as a reminder that all clinical activity carries the potential for harm (Smith 2005). In this way, the norm of non-maleficence is integral to the ethical formation of medical students, where learning to become a doctor involves the ability to practise medicine in the face of fallibility and uncertainty. It involves the inculcation of the fact that as a clinician your decisions and actions might cause harm, disability and death for the patients, regardless of your good intentions (Fox 1957; Paget 1988).

From an organizational and societal perspective, managing medical error and misconduct function as a way to establish the line between acceptable and unacceptable medical practice and office-holding.

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7_1

Internal collegial procedures for detecting, classifying, disciplining or forgiving error have historically been a necessary part of professionally driven processes of social control and of teaching young doctors the standards of medical practice (Bosk 2003 [1979]). Parallel to these internal mechanisms, external and public measures such as depriving doctors their licence to practise medicine and—increasingly since the 1970s—malpractice claims and liability suits operate as legal mechanisms for regulating cases of medical negligence or unfitness caused by, for instance, physical and mental disability.

In the last two decades, a new version of patient safety—the international patient safety policy programme—has emerged with propositions, objectives and consequences that differ fundamentally from the traditional approaches to medical error and error management. In patient safety thinking and practice as it has developed since the early 1990s, patient safety has become a policy problem linked to wider discussions of service delivery in healthcare and to parallel and overlapping healthcare policy agendas such as evidence-based medicine, quality improvement and New Public Management–inspired ideals of public sector management based on principles of accountability, measurability and risk management. Within the sphere of this new policy approach to patient safety, the purpose of patient safety and error management has radically changed. Error management no longer primarily serves the ethical training and conduct of the medical profession or the legal regulation of medical malpractice. Rather, patient safety policy, technology and ideology are first and foremost to serve the optimization of healthcare systems. Based on a vision of failsafe system design, patient safety and error management have been introduced as optimization and reengineering strategies, where the goal is to create a learning and reporting culture through a blame-free ethos. Here, mishaps, errors and critical incidents are used as catalysts for introducing new types of technological fixes, failsafe devices and standardized protocols, checklists and procedures, all with the ambition of strengthening the system by preventing errors of similar kinds.

The programme has been brought forth through different types of developments of which one concerns a growing awareness of the magnitude of the safety problem in healthcare. Starting with the Harvard Medical Practice Study from 1991, where it was shown that harmful

error—or what was soon to be known as adverse events or critical incidents—happened to 4 per cent of hospitalized patients (Brennan et al. 1991; Leape et al. 1991), an emergent public and political concern with the high number of errors and a related questioning of the efficiency and adequacy of the existing internal professional and external jurisdictional error-management strategies helped promote the new policy agenda and its ideal of system optimization. This growing awareness was stimulated by a number of medical error scandals in the USA and Britain of which the Betsy Lehman scandal was of special importance. Lehman was a 39-year-old Boston Globe reporter who during her treatment at the Dana-Faber Cancer Institute in 1994 died from an overdose of chemotherapy. The Lehman case made no less than 28 front-page headlines in the USA in the three years following the incident (Conway and Weingart 2005). Public scandals such as the Lehman case and the rising awareness of the number of medical errors led the way for the success of the seminal American Institute of Medicine report *To Err Is Human: Building a Safer Health System* (Kohn et al. 2000). The earlier Harvard study came to have immense importance in allowing for the Institute of Medicine report to pose its well-known statement that up to 98,000 Americans die in hospitals each year as a result of medical errors that could have been prevented. Interestingly, however, the preventability theme was not part of the original Harvard study but rather an invention to support the particular 'error-prevention through redesign' perspective on patient safety that has come to define the policy agenda. Concurrent with the growing popularity of *To Err Is Human* internationally, the American studies were followed by similar studies in other Western countries (Davis et al. 2002; Schiøler et al. 2001; Vincent et al. 2001; Wilson et al. 1995; Baker et al. 2004) on the basis of which it was—and still is—generally agreed that approximately every tenth patient experiences a medical error during hospitalization.

A second important reason for the success of the new safety programme is the strong increase in medical malpractice claims. Especially in the USA since the 1970s (Thorpe 2004) but increasingly also in other Western countries, a rising number of cases of malpractice are treated in legal systems created to deal with questions of, on the one hand, compensation and, on the other, intent, personal fitness or neglect in order

to determine if the treatment provided falls below the accepted standard. The international patient safety programme can be understood as a way to minimize this problem of medical liability. At the same time, the programme is often perceived as an alternative approach to error management, established on an immanent critique of the legal system's difficulties of addressing the distributed agency of medical practices and the cooperational and systemic components of certain types of medical errors. In other words, legal systems have a tendency to put persons and not medical teams, technologies, organizations, management or systems on trial. From this perspective, the current safety agenda has been a way for the medical profession to draw attention to the 'systemic' components of medical errors. This can partly explain the strong professional support to the patient safety movement that has largely been driven and developed by doctors on the policy and institutional level and by nurses on the organizational level. With the focus on systemic error and the efforts to create 'learning cultures' in healthcare organizations through blame-free methodologies and rhetorical strategies, the programme can be understood as a professionally led attempt to create a regime for dealing with errors alongside the legal system. This parallel way of managing error has resulted in a new system for internal control through reporting and analysis of incidents, safety audits, retrospect journal reviews and a whole range of standardized safety methodologies and tools, which can be understood as part of a 'regulatory epistemology' in which internal control and risk management systems represent organizations as trustworthy for the public through production of certain types of evidence (Power 2007: 40). Or, as argued by Jessica Mesman, '[t]he danger to be indicted for malpractice has set in motion an avalanche of numbers' (2008: 191).

The safety programme and its ideal of system optimization through failsafe organizing are founded on and enacted through a set of basic assumptions about medicine, errors, risk, health professionals and health systems. One assumption concerns medical 'culture'. It is a dominant trope in mainstream patient safety literature that healthcare organizations are dominated by practices of blaming and shaming, where errors give rise to individual witch hunts and layoffs. The tale of a blame culture is used to promote the need for a blame-free perspective as well as to argue

for a systems theoretical view on error management. Another assumption concerns the possibility of risk elimination. Already with the 'preventability' theme of *To Err Is Human* (Kohn et al. 2000), it is implied that risk and errors can and should be prevented through appropriate failsafe system design. A third assumption concerns 'human nature'. In mainstream patient safety thinking, humans (i.e., health professionals) are established as essentially and permanently error-prone. This proclamation is used to found the argument that safety management should strive to improve systems rather than relying on training and development of appropriate routines, competences and skills of those working in these systems. Lastly, the patient safety programme is based on a quest for certainty and a faith in organizing principles. Today most patient safety technologies are based on the idea that healthcare organizations are relatively stable systems that can become failsafe though standardization and the reduction of practice variance. But also the most dominant of the current alternatives to the mainstream approach, the Resilience or Safety II approach to patient safety, promote a set of organizing principles based on the possibility of predetermining the main characteristics of healthcare settings (Hollnagel et al. 2013, 2015; Braithwaite et al. 2015).

In this book, I inquire into these four assumptions of the patient safety programme; I investigate the particular ways they are enacted in healthcare; I challenge them one by one; and I develop a pragmatic stance on patient safety that takes its point of departure in the concrete clinical situations and pragmatic clinical practices in which patient safety is enacted based on a complex combination of trained and internalized safety dispositions, practical types of reasoning, well-founded routines and skills, ethical attitudes, thoroughly rehearsed teamwork as well as guidelines, protocols and technologies. By proposing a case-based and situated way into safety, the book offers an alternative vocabulary for understanding and approaching safety and risk management in healthcare particularly and in public sector institutions more generally. Moreover, it would seem that these findings and the presented pragmatic approach are not only of relevance for safety and risk management—but more generally for contemporary management thinking where centralized and standardized system improvements are often presupposed as the 'right' solutions to various organizational problems.

In the remainder of this introduction, I present the programme as an international movement and as a study object, I familiarize the reader with the empirical context for the studies of medical practices and safety technologies on which the book is founded, and I introduce the pragmatic stance that informs it.

An International Movement

The patient safety policy agenda and its quest to create failsafe organizations through system optimization is an international phenomenon. Patient safety has become institutionalized in the Western world at large, and increasingly in developing countries as well. This process has occurred through massive coordinated efforts originating from international agencies and dominant national players, mainly American. The World Health Organization (WHO) has, since the launch of The World Alliance for Patient Safety (WHO 2004), been an important player in this institutionalization by explicitly aiming 'to coordinate, disseminate and accelerate improvements in patient safety worldwide'.[1] Today, WHO stands behind, amongst other initiatives, the development and spread of various global campaigns, training programmes, global focus areas such as infections, safe surgery and patient involvement; guidelines and manuals for reporting systems and other safety technologies; and checklists for hand hygiene, surgery, childbirth, trauma and much more. Other important governmental as well as non-governmental global players include the American Institute of Medicine, which set the agenda with *To Err Is Human* (Kohn et al. 2000); the American Institute for Healthcare Improvement (IHI), which plays a major part in innovating and disseminating new patient safety methodologies; and the accreditation organization Joint Commission, which serves equally as a consultant on safety improvement methodologies and increasingly includes patient safety as an indicator in accreditation systems. On the national scale, the list includes the Australian Patient Safety Foundation Inc., which was established as early as 1988, the Canadian Patient Safety Institute, the German Coalition for Patient Safety and the Danish Society for Patient Safety, to name just a few. In fact, the list of such organizations is now so

comprehensive that a co-called Patient Safety Organization (PSO) is a well-established concept that even appears as a separate article on Wikipedia.[2] These organizations, and the representatives of patient safety advocacy elsewhere, work alongside WHO with the ambition to coordinate, disseminate, accelerate and, it should be added, homogenize and standardize safety efforts nationally or internationally.

The massive internationally coordinated efforts have major effects on the enactment of patient safety locally. Safety technologies based on similar standards and manuals are imported from other high-risk industries, especially aviation, and disseminated worldwide. This includes the technologies that support reporting and analysis of critical incidents. Portrayed as, for instance, the 'cornerstone of safe practice' or the 'measure of progress towards achieving a safety culture' (WHO 2005: 7), incident reporting is often described as the main tool to achieve safety in healthcare. Reporting has been part of the patient safety programme from its inception and today incident-reporting systems are possibly the programme's most visible trademark in Western healthcare systems. *To Err Is Human* recommended 'identifying and learning from errors through immediate and strong mandatory reporting efforts' (Kohn et al. 2000: 31) and *An Organization with a Memory*, the British equivalent to the American Institute of Medicine report, advocates for a 'new national system for reporting and analysing adverse health care events, to make sure that key lessons are identified and learned' (2000: v–vi). The first systems for reporting adverse events in healthcare were established during the international debate that followed in the years after these recommendations were uttered. The USA never established the general state-based mandatory system that *To Err Is Human* advocated. However, most states have voluntary and some have mandatory systems for serious patient injuries. In Britain, the voluntary but comprehensive National Reporting and Learning System was established in 2003, and with 'The Danish Act on Patient Safety' Denmark was the first country to introduce a national mandatory and non-sanctionary reporting system in 2004.

With respect to incident analysis tools, a rage of different methods is available of which different versions of the root cause analysis (RCA) are the most dominant. The RCA is an analytical tool for more severe incidents (often described as 'sentinel events') where an investigation

team—through a set of strictly standardized steps—seeks to determine the 'root causes' of a particular incident with the purpose of inventing a number of action plans. These plans are to prevent future incidents of similar kinds, ideally by reducing dependability on variation and increasing standardization by introducing new procedures, guidelines, checklists and technological safety systems (NHS 2008; Jensen 2004). Other specific technologies include Global Trigger Tool (retrospective review of patient records), Early Warning Score (observational method to detect emergency signals in patients), Situation, Background, Assessment, Recommendation (SBAR, safe communication tool) and Waste Identification Tool (lean production inspired method, for the screening of ward sections for safety gains and waste of resources) as well as a large number of toolkits and standardized procedures for reducing catheter- and central line–associated infections, fall injuries, pressure ulcers, adverse drug events and much more.

Apart from the specific safety technologies, similar campaigns are introduced worldwide and similar training programmes have been established based on a globally used collection of arguments, texts and labels so that becoming a risk manager, for instance, involves performing functions and addressing safety issues with a mindset and collection of tools that is developed in accordance to international standards. Often it is the same group of quality developers and safety engineers who give talks in patient safety conferences globally, using the same metaphors and illustrations to repeat the message and methods of patient safety. Such patient safety 'gurus' have played a tremendous role in the dissemination and standardization of the programme. These include, for instance, Donald Berwick, founder of the Institute of Healthcare Improvement in the USA; Lucian Leape, professor at Harvard and a main force in the introduction of the systems perspective in patient safety (1991, 1994, 1997; Leape et al. 1998), the British Sir Liam Donaldson, previous Chief Medical Officer and corresponding author to the influential *An Organization with a Memory* (Department of Health 2000), and safety scholars such as UK Professor of Psychology Charles Vincent (Vincent 2010; Vincent et al. 2013) and more recently Professor Eric Hollnagel, one of the main forces behind the new Safety II agenda in healthcare (Hollnagel et al. 2013).

Studying a Programme

In this book, the term patient safety programme is used to comprise the internationally implemented patient safety reforms, the rationalities on which they are built, and the technologies and procedures by which they are enacted. Analytically there are several ways of approaching and defining an arrangement such as the patient safety programme. In the search for a useful definition, I have been inspired by a certain Foucauldian analytic of government, where policy programmes are approached as equally including ideological and technical elements. In Michael Power's work on 'the audit society', he claims that 'audit is an idea as much as it is a concrete technical practice' (Power 1997: 5). This distinction between the propositions, claims, ideas and statements that set out the objectives for government and the procedures, tools and calculations that materialize these ideas has also been articulated as a distinction between political rationalities and the body of technologies that render these rationalities operational (Miller 1990, 1991; Rose and Miller 1992). In line with this, patient safety consists of, on the one hand, a few rather distinct presuppositions about the nature of humans, risk, order and organizational reality—under headlines such as human factors, 'non-blame' and systems thinking—and, on the other, the concrete technologies, methodologies and procedures primarily connected to reporting and analysis of critical incidents, which constitute the operational basis for 'safety practices'. The relation between rationalities and technologies of patient safety is defined by a complex set of reciprocal relations, fluent boundaries and coordination by which activities are generally taken in a similar direction. This reciprocity is especially important to stress, as there is not necessarily a casual line from political rationality to its operationalization via technologies. In fact, there is no natural distinction between rationality as an end and technology as a means to this end. Rather, it is, in the case of patient safety, often the technology—for instance, in incident reporting and analysis—that calls for a particular rationality as part of its enactment. Blame-free ideologies and failsafe systems rhetoric can, from this perspective, be seen as a way to get health professionals to disclose and report errors. Hereby, the political rationalities are just as much tools as

they are objectives, whereas the technology—the incident-reporting system, for instance—becomes a political end in itself. So while a definition of the patient safety programme as including normative/ideological and technological/operational elements is useful, too much emphasis on these distinctions risks creating a false illusion of a natural split, where ideas are not technical and technologies are not normative. In patient safety, it is often the technologies that most strictly enact the programmatic ideals, assumptions and normativities of the policy agenda.

It is important to stress that the patient safety programme is not a clearly delineated and stable entity that is evenly and smoothly implemented in all healthcare settings in the Western world but rather a group of practices and ideologies that have developed over time and are constantly negotiated across different sites. To speak of a programme, then, is not to say that patient safety initiatives are always successful or that such initiatives are not reinterpreted, resisted or rejected locally. As is always the case with 'travelling technologies' (Nielsen 2010), they are to a varying degree adjusted and translated when introduced into the local healthcare setting. And throughout the programme's more than two decades on the health political scene it has inevitably undergone changes. There are therefore numerous stories to be told about the programme including one in which the characteristics of the programme have become more principle-based and less pragmatic over the years, but also one that points to the programme's ability to, at least to some extent, incorporate critique, resistance and developments from clinical practice into its solutions and promoted concepts. An example is current 'fair blame' or 'just culture' approaches (in an attempt to combine accountability with the blame-free agenda—Timbs 2007; Khatri et al. 2009; Dekker 2012) or the increasing critique of the linear rationality and hindsight bias of incident analysis processes by patient safety representatives and safety scientists themselves (see Chap. 7).

When studying the patient safety programme with a sociological and more critical attitude, it is a widely adopted strategy to look for instances of implementation problems, for creative reworkings, translations or resistances of formal procedures, legal frames or technological innovation, often with the purpose of describing the difficulties of aligning programme and practice or to draw attention to the multitude of different

ways of doing patient safety work apart from the formalized strategies of the safety programme (see, for instance, Currie et al. 2008; Jerak-Zuiderent 2012; Mesman 2008; Zuiderent-Jerak et al. 2009). This book pursues a slightly different strategy. Instead of attending to implementation problems, resistances or adaptations, the goal is explicitly to study the patient safety programme when it is systematically institutionalized into the legal, political and institutional frames, thoroughly implemented into clinical settings and internalized into the conduct of the health professionals. Without losing sight of the fact that with any implementation of a safety technology its concrete enactment in the clinic is a matter of negotiation and adaptation to the situation at hand, it hereby becomes possible to ask what *also* happens when the most dominant patient safety rationalities are adopted and enacted and the most widespread patient safety technologies are well implemented and working pretty much as intended. In order to make this type of case study, the Danish healthcare system has been a natural choice.

Patient Safety in Denmark

Denmark is a pioneering country when it comes to adopting patient safety reforms and legislation. Because of its small population of close to 6 million and due to the fact that the Danish healthcare sector is predominantly state-financed and relatively centralized[3] conditions have been ideal for creating a fairly swift and thorough introduction of patient safety thinking and practice in Danish healthcare organizations. In the aftermath of the Institute of Medicine's *To Err Is Human* (Kohn et al. 2000), Denmark was one of the first countries to put patient safety on the health political agenda. A pilot study conducted in 2001 found that 9 per cent of patients were harmed as a consequence of medical error during their admission within the Danish hospital system (Schiøler et al. 2001). In the same year, the Danish Society for Patient Safety was established, a non-profit organization consisting of representatives from a wide range of healthcare stakeholders and with a declared goal of gathering, spreading and developing patient safety knowledge and initiatives and to ensure 'that patient safety aspects are a part of all decisions made in

Danish healthcare'.[4] On January 1, 2004, the Danish Act on Patient Safety was adopted, which obliged healthcare professionals in Danish hospitals to report errors and critical incidents to a national incident-reporting system. As described, Denmark thereby became the first country worldwide to introduce mandatory reporting on a national scale. From 2010, the Safety Act was expanded to include healthcare workers in the primary sector, and it has since then also been possible for patients and their relatives to report incidents. In 2016, the National Danish Patient Safety Database received a total of more than 189,000 incident reports (The Danish Patient Safety Authority 2017).[5]

The Danish incident-reporting system is intended solely for learning, and the patient safety act's extraordinary §201 establishes that '[a] health person who reports a critical incident cannot as a result of that report be subjected to investigations or disciplinary actions by the employer, the Board of Health or the Court of Justice'.[6] With this statement, the blame-free perspective of the programme was institutionalized from a very early stage in Denmark. Apart from incident reporting, the standard international safety technologies have all been introduced in Danish healthcare. This includes incident analysis tools, medical emergency teams, safe communication tools, process optimization tools and a long list of safety procedures, protocols and systems including surgical checklists, hand hygiene procedures, patient fall toolkits as well as more general inspection and control activities such as safety rounds, safety audits and patient record reviews. Additionally, a few wide-scale national patient safety campaigns—Operation Life (2007–2009) and Patient Safe Hospital (2010–2013)—have boosted the implementation of patient safety in Danish hospitals in specific areas. The majority of these technologies, projects, initiatives and campaigns are indirectly guided or directly managed by the Danish Society of Patient Safety (DSPS), often in cooperation with the regional government, and, in this way, the DSPS has become a powerful factor in enforcing the safety programme, translating the often American-developed tool and protocols into the Danish system and ensuring a high degree of standardization across the local environments.

While Danish healthcare has been pioneering in the patient safety arena as a whole, some regions and hospitals have been taking a leading role in this endeavour. The large Danish university hospital where

I conducted the main research for this book between 2009 and 2012 is one such hospital. Here incident reporting was introduced as early as in 2001—tree years before the patient safety act made it obligatory in the rest of the country. And the hospital has since then played a prominent role in testing, introducing and spreading patient safety thinking and practice locally and nationally. Thus, the book's empirical case displays some of the organizational consequences of international patient safety technologies and rationalities in an advanced, widely accepted and thoroughly implemented form. Because of the pioneering status of the chosen case, and of the international patient safety programme's high level of standardization and unification across countries, the case study has the potential to function as a paradigmatic case (Flyvbjerg 2006); that is, a case with the ability to identify tensions, dilemmas and unintended consequences of the meeting between programme and practice that are common, while taking, of course, the always present local translations into account.

Alternative Approaches and Dichotomizing Tendencies

Mainstream patient safety thinking and practice have received increasing critique from social scientists and safety engineers in recent years, and a growing number of researchers propose alternatives to the patient safety programme's approach to medical errors, health systems and improvement practices. Two primary streams of alternative voices should be mentioned. One comes from social scientists, especially from within sociology, Science and Technology Studies and organization theory (see special issue 'New approaches to researching patient safety' in *Social Science and Medicine* 2009; special issue 'The Sociology of Healthcare Safety and Quality' in *Sociology of Health and Illness* 2016; Rowley and Waring 2011). The social scientific approaches often argue that while the new programme has mainly focused on the clinical micro level and on the human and local factors in shaping quality and safety, sociological perspectives are particularly useful in attending to a wider context in terms

of the social, cultural and political factors that shape safety (Waring et al. 2016; Allen et al. 2016; Jensen 2008). The other stream of critical alternatives to the patient safety programme comes from within safety science and especially from resilience engineering where parts of the current programme are increasingly criticized not least based on the lack of consistent evidence of the positive effects of the current strategies. Hence, a new paradigm based on complex systems thinking is proposed (e.g., Braithwaite et al. 2015; Hollnagel et al. 2013, 2015). Resilience, understood as the system's ability to adjust and adapt its function in case of disturbance, is here said to be the new answer to patient safety problems. By arguing that healthcare is a complex system, and perhaps even a system with 'unique complexities' compared to traditional high-reliability industries (Jeffcott et al. 2009: 256), resilience engineering—also referred to as Safety II—is seeking to redesign health systems in order to make them capable of responding to the unexpected.

Although there are important differences between these two alternative strands, they are connected by the important aim of challenging or correcting the dominant regime and to 'question dominant ways of understanding safety' (Mesman 2009: 1705). It is, however, also possible to detect a tendency within many of these studies to form alternatives in a similar way, namely by drawing attention to certain challenges concerning specific features of the mainstream approach on the basis of which, then, oppositional features are offered to contrast those of the programme. This has led to arguments concerning the need to go from an understanding of reality as essentially stable to essentially unstable; from approaching health systems as linear to understanding them as complex and adaptive; from a reactive focus on error where focus is on what goes wrong to a proactive and 'positive' focus on strengths where safety is defined as that which goes right; as well as a general tendency to reject the hard, rational, linear, visible, predictable stuff and turn, instead, to the mushy, irrational, complex, invisible, variable stuff when addressing questions of patient safety.

The available alternative approaches to mainstream patient safety thinking take important steps towards challenging, questioning or correcting the dominant regime and throughout this book the more situated and pragmatic of these studies help the formation of its stance on patient

safety. It is, however, important to acknowledge that the rhetoric of dichotomization can lead to arguments and solutions in which present safety research and practice is not so much fundamentally challenged as simply inverted. Moreover, with dichotomization one risks insinuating that if focus is changed from one part of the dichotomy to the other, that is, from standards to resilience, from uniformity to complexity, from error to strength, failsafe organizing is within reach.

Inspired by the American pragmatists' and most prominently John Dewey's quest to go beyond the temptation of dichotomizing, this book turns to practical reasoning and pragmatic method as a different lens by which to approach the question of safety management in healthcare. With a pragmatic approach it is equally problematic to believe that safety is obtained by substituting a principle of blame with a principle of 'non-blame', as it is to promote, for instance, a principle of complexity or flexibility as a substitute for one of uniformity or causal linearity.

A Pragmatic Stance on the Clinical Situation

I describe the particular attitude developed throughout the book as 'a pragmatic stance'. This denotes an attitude that equally accounts for the specific approach and analytical strategy of the book and for the particular stance on clinical practice and patient safety it develops. The term is inspired by Bas van Fraassen, who has formulated an 'empirical stance' supported by trends from anti-metaphysical and empiricist philosophical traditions (2002). By attending to empirical inquiry and the researcher's attitude towards empirical investigation and exploration, van Fraassen argues that a position can consist of a stance, that is an attitude, commitment, approach or intellectual deportment, rather than a theory or an ideology (2002: 47). By adopting a pragmatic stance, I embrace a particular attitude towards the empirical field and towards the methods and rules of situated and problem-based inquiry. It is an anti-metaphysical and non-dogmatic stance favouring the empirical, practical and concrete over the abstracted and principle-based, which includes also a strong scepticism towards any *a priori* dichotomization as a way to explain or act in the world. With a pragmatic attitude, any proposition, working

hypothesis, theory or argument must be judged exclusively by its ability to deliver effective and relevant solutions to the problems posed by the empirical world. Dewey argued as follows:

> An experience, a very humble experience, is capable of generating and carrying any amount of theory (or intellectual content), but a theory apart from an experience cannot be definitely grasped even as theory. It tends to become a more verbal formula, a set of catchwords used to render thinking, or genuine theorizing, unnecessary and impossible. (Dewey 1916: 144)

When theory is enacted as *a priori* truth-claims—or just as a repetition of certain words and catch phrases—it becomes a meaningless exercise that stops us from asking important and difficult questions about our empirical experiences. In this way, the pragmatic stance should be contrasted with more metaphysical, principle-based or theory-driven attitudes including, for instance, commitments to poststructuralism, radical constructivism or 'process philosophical' views on organizing—but also parts of safety science and its commitment to human factors principles or complex systems theory, for instance (see Hunter 2006 and Du Gay and Vikkelsø 2013 for a critique of the metaphysical stance).

One way of approaching clinical practice from a pragmatic stance is by attending to actual clinical situations. To Dewey, any experience that involves interaction between an organism and its surroundings marks a situation. In his later work, he promoted the concept of 'transaction' instead of interaction to mark the inseparability, reciprocity and mutual dependency between an individual and the surroundings in concrete situations (Dewey and Bentley 1949). Inspired by this understanding of the situation, and as a way to resist *a priori* dichotomization, I use the notion of 'the clinical situation' to comprise the reasoning, practising and organizing that goes into the clinical task of treating and caring for the sick.

Starting an inquiry with concrete clinical situations is a way to address internal and external conditions simultaneously, and therefore it is a way to overcome the distinction between the individual and the social, or humans and systems, for instance. Instead, attention is automatically drawn to the interconnections and inseparability between the health professional, the clinical practices and the wider organization of care.

And just as it makes little sense to divide error, for instance, into human and systemic ones from this perspective, it makes equally little sense to talk about either blame/non-blame or stability/change *a priori* from attending to the specificities of the situation. Starting from the situation, then, prevents us from making assumptions about the character of the health system, the nature of the errors and incidents in question, or to predetermine a best way of organizing or a certain type of solutions to safety problems. It allows for the preservation of the practical, pragmatic and situation-based ways of reasoning, which has dominated the understanding of medical knowledge until recently, and for maintaining the importance of practical human inquiry in safety issues.

Researching Patient Safety

> Without a problem, there is blind groping in the dark. The way in which the problem is conceived decides what specific suggestions are entertained and which are dismissed; what data are selected and which rejected; it is the criterion for relevancy and irrelevancy of hypotheses and conceptual structures. (Dewey 1938: 108)

This book can be defined as an inquiry into the problem of patient safety. Throughout the chapters, this problem is attended to by analysing the patient safety programme and the assumptions that constitute its faith in failsafe systems, its ideological and technological components and its enactment in—and unintended consequences for—situated clinical practices, practical types of reasoning, redistribution of risks and the subtle and often invisible transformations of responsibility structures and the particular modes or ways of the clinician.

According to Dewey, the process of constituting the terms of the problem is the most important part of any inquiry. The centrality of the problem means that not just propositions (theory, working hypotheses, analytical suggestions, etc.), but also methodologies and data are to be approached as tools or means, whose 'success' is measured by their ability to enlighten the problem of the inquiry. Methods are 'never something outside of the material' (Dewey 1916: 165) but must be chosen and developed in specific relation to the conditions of the problem in question.

This entails, on the one hand, a certain type of creativity: 'What scientific inquirers *do* as distinct from what they *say*, is to execute certain operations of experimentation' (Dewey 1938: 498). On the other hand, it requires the ability to draw on already established techniques and skills available for the researcher to 'supplement the narrowness of his immediately personal experiences by utilizing the experiences of others' (Dewey 1916: 157). In more recent times, Howard Becker (1998) has echoed this pragmatic attitude to method by arguing that theories and methodologies essentially serve the same purpose. In line with Dewey, he defines both as 'a collection of tricks, ways of thinking that help researchers faced with concrete research problems make some progress' (Becker 1998: 4).

In line with this perspective, my study of the patient safety programme, its assumption and its consequences have required a range of different methodological strategies, and therefore the empirical sources of this book are many and of a varied kind. They include, for instance, a document analysis of mainstream patient safety literature, models and technologies; a study of earlier social scientific studies of medical error and safety management; as well as the production and analysis of ethnographic data from fieldwork conducted in Danish healthcare settings. The empirical cases, clinical situations, organizational myths, particular incidents and safety technologies discussed in this book have all been selected with a view to their ability to enlighten the problem under scrutiny, i.e., the assumptions and requirements of the patient safety programme and the possible tensions between these and the concrete clinical situations they seek to influence. As such, the ethnographically inspired case studies are only one source out of a palette of empirical sources of equal importance to the overall argument. Now, however, a few words should be said about these studies.

Ethnographic Studies and the Establishment of a Problem

In 2009, I conducted a qualitative case study investigating patterns of critical incident reporting in primary care. The political decision to expand the Danish Act of Patient Safety of 2004 to include the primary

sector by 2010 did not come with a discussion of the differences between secondary and primary care sectors, or how such differences should be reflected in the design of the safety technologies. A fellow researcher and I investigated some of these challenges in a study of a newly introduced incident-reporting system in elderly care in a middle-sized Danish municipality. The study was based on observational studies (shadowing of care workers in nursing homes and in homecare services) and interviews with care personnel, managers and elderly citizens.[7]

Our study (Jensen and Pedersen 2010) suggested that there were important difficulties in assuming that the hospitals' incident-reporting system could be readily imported into, for instance, elderly care units. One problem, for example, concerned issues of defining the limits of treatment when working in citizens' homes: Are homecare workers, for instance, responsible for the elderly's safety all the time or only when they are present? Other issues concerned more fundamental questions about the relation between the citizens' autonomy and safety issues: What should be done, for example, when the slightly demented refused to get their medication administered, with possible medication error as a result? In this way the study gave rise to a growing curiosity in relation to how reorganization of work and attention are likely to follow the introduction of safety technologies, and it drew attention to some of the situated concerns that are not easily combined with standardized safety tools and a 'one fits all' implementation strategy. The primary care study therefore served as a first introduction to the problem of patient safety; as an initial indication of the main propositions of the programme and its technologies; as a provider of important experiences of the particularities of different kinds of care work; and as a reminder of the situatedness of the safety issues inherent to this work.

From late 2009 to 2012, I conducted an ethnographic study in a medical centre at a Danish university hospital. The sensitivity of the particular area of medical work I was interested in resulted in a long process of negotiation with the hospital's juridical department about a cooperation and confidentiality agreement. When it comes to patient safety, or with the Danish popular press's preferred word 'lægefejl' ('doctor errors'), much is at stake: reputation, careers, finances, i.e., all those issues that have been determined by Michael Power and colleagues as 'reputational

risk' (Power et al. 2009). The contrast between the rhetoric of learning, openness and 'non-blame' of the patient safety programme and the rhetoric of guilt, neglect, blame and responsibility on the part of the public and press pointed towards core tensions and suggested some of the challenges of understanding the health professional as 'the second victim' of a critical incident (Wu 2000).

Methodologically, I was inspired by ethnographic studies of work, organization and technology in healthcare practices (Berg 1997; Strauss et al. 1985; Svenningsen 2003) and I pursued a manifold strategy of following actors, technologies and regular work practices (Latour and Woolgar 1979; Latour 1987). I started out by following the centre's quality coordinator (a nurse employed full-time to handle quality- and patient safety–related work) to her patient safety–related work tasks and meetings, including patient safety audits, courses and educational events, and a host of meetings comprising quality network meetings, task force group meetings concerning the implementation of new safety protocols and meetings on clinical level concerning local projects, such as the design of new identification wristbands. In this inductive process, I became especially interested in the RCA as a complex and often highly meaning-saturated and intense process, where the performance as well as the limits of current patient safety thinking and practice is displayed. The incidents under investigation are most often complicated, ambiguous cases, where it is not easy to determine causes and responsibilities. Such cases instil not only complicated technical problems of solutions, but also questions of moral. As Jonson and Toulmin argue,

> it is just those situations that are not covered by appeal to any single simple rule that begin to be problematic; and in just those cases our concern to act rightly gives rise to genuinely moral 'questions' or 'issues'. (Jonsen and Toulmin 1988: 7)

Over the course of one year I followed five such incident analysis processes. Moreover, I attended a wide range of patient safety events in Denmark and internationally from 2008 to 2016 including educational events, patient safety conferences and various kinds of workshops and seminars, some in the role as researcher, some as participant and some as speaker.[8]

Content

The chapters in this book can be read separately. Each chapter uses different analytical and methodological tools and has relatively delineated analytical and empirical contributions to specific debates, fields or research environments. At the same time, they are chapters in an ongoing argument. Through somewhat different routes, and through the discussion of different elements of the patient safety programme and particular clinical situations, they seek to contribute to the development of an overarching line of reasoning by treating related empirical cases, developing analogous structures of argument and building on a similar pragmatic and practical attitude. Because of this format, the reader will experience that some points and arguments are repeated throughout the book, in only slightly different shapes.

The best way to get acquainted with the patient safety programme and the limits of failsafe organizing is by empirical example. *Chapter 2: The Oral Syringe Case* investigates the introduction of a failsafe device in a medical centre and shows that although the healthcare professionals were persuaded to use the new safety system, the introduction of the device had massively unwanted consequences in terms of coordination problems, economic problems and new risks to patient safety. The chapter also discusses how the failsafe vision of the programme risks challenging the training and nurture of important safety dispositions and routines in healthcare.

Chapter 3: Failsafe Systems and Practical Reasoning introduces a main tension between the patient safety programme's principle-based, systemic and simplistic 'scientific' stance, on the one hand, and the practical attitude of medical reasoning, as this has traditionally been depicted, on the other. The chapter describes how the main assumptions, popular idioms and positivist ambitions of the programme are disseminated through enthusiastic advocacy and dominant organizational tools, such as *To Err Is Human* (Kohn et al. 2000), the Swiss Cheese Model (Reason 1990) and the RCA (WHO 2005; NHS 2008). Juxtaposing the conceptions of the programme, I introduce a number of practical philosophies that have all used medicine as an exemplary case of practical reasoning (Aristotle 2000; Dewey 1916, 1922, 1938; Jonsen and Toulmin 1988). Here medical

knowledge is inseparably connected to acting in concrete clinical situations where 'evidence' and guidelines are to be related to the partial and developing knowledge of concrete cases.

In each of the four chapters in part II of the book, I challenge one of the key assumptions of the patient safety programme. *Chapter 4: Blame and Responsibility in Patient Safety* challenges the key assumption within mainstream safety literature that medicine is dominated by a culture of blame. To test this claim, the chapter presents an analysis of significant sociological studies of medical training, internal error regulation and clinical safety culture written before the inception of the present safety programme (Bosk 2003 (1979); Fox 1957; Paget 1988; Rosenthal 1995). Based on this reading, the image of a person-centred and blame-inducing clinical culture is fundamentally contested. Rather, clinicians are, in these studies, acutely aware of safety issues and have developed an informal, delicate and gentle ecology of co-collegial observation, classification and management of different sorts of errors and mistakes. The earlier studies further show that the uncertain, time-dependent and fallible character of medical knowledge have the effect that incompetence and malpractice are sometimes hard to identify—a problem not of too much blame then, but perhaps even too little. By rearticulating traditional modes of error management within the professional community, the chapter also functions as a frame of reference for the remaining chapters.

Chapter 5: The Distributed Risks of Patient Safety turns to another dominant assumption of the programme, namely, its faith in the possibility of risk elimination, and it shows that rather than being eliminated, risks and problems are likely to be redistributed. The chapter identifies four different categories of unwanted problems or organizational effects resulting from the introduction of the patient safety programme in healthcare: classification risk, second-order risk, standardization risk and responsibility risk. It is further argued that all four of these risk categories can be linked to the highly principle-based nature of the programme, which is likely to reduce the possibility of addressing safety issues with a more situation-based and pragmatic stance.

In *Chapter 6: Learning in Patient Safety*, I proceed by challenging the formalized systems learning approach of the patient safety programme. Based on an idea of human fallibility, the patient safety programme

promotes systems learning through system improvements, often independently of the experiences, habits and practical reasoning of the healthcare professionals. Through the analysis of a critical incident, I describe how crucial intuitions and hunches of the personnel were overruled not only during the incident but also in the subsequent investigation process. It is further argued that the blame-free ethos of the programme risks disrupting learning processes in the aftermath of critical incidents. A new view on learning is consequently introduced with reference to John Dewey (1922), who understood learning as the formation and correction of intelligent habits. Through the empirical case and Dewey's framing of learning, a supplement to systemic learning theory is presented that re-establishes habits, intuitions and experiences as vital in safety critical learning situations.

Chapter 7: Stability and Change in Patient Safety warns against the presumption of certainty and the reliance on *a priori* organizing principles, which dominate contemporary approaches to safety management. While mainstream patient safety literature percieve health systems as relatively stable, medical errors as preventable and standardization as the pre-eminent solution to safety issues, a new engineering approach, Resilient Safety or Safety II, presents safety as the ability to adapt to and be flexible in relation to ever-changing, unstable and complex surroundings. By analysing a medication error occurring during the production of paediatric chemotherapy, as well as the solutions proposed by the subsequent RCA process, the chapter examines the promises and pitfalls of the new resilience approach and discusses how more situated approaches might end up presupposing certainty by reproducing the divide between stability and change. In conclusion, and to set the scene for the inquiry's final part, Charles Perrow (1972, 1984) is cited for suggesting a more subtle and mutually constituent relationship between rules and discretion, standards and flexibility.

In the final part of the book, I present the contours of an alternative way of approaching the problem of patient safety. *Chapter 8: A Pragmatic Stance on Safety Management* presents three contemporary authors who, each in their way, posit a pragmatic stance on safety management (Holmes 2009; Law 2000; Mesman 2008). Based on these and on the empirical analyses and practical attitudes that have been developed throughout the

book, the chapter draws the contours of a non-dichotomizing and situation-based alternative to the patient safety programme's principle-based stance on safety, risk and improvement practices in healthcare. Accordingly, three axioms are presented to function as rules of thumb for safety management in concrete clinical situations: (1) take point of departure in the clinical situation; (2) be cautious about ideals of risk elimination through system improvements; and (3) preserve the importance of existing practices, habits and experiences.

In the concluding *Chapter 9: Patient Safety as Trained Dispositions and Moral Education*, I address the need to regain focus on the training, nurturing and regulating of safety dispositions in healthcare, and more specifically in the education of clinicians. I argue that curriculums and practical training should approach patient safety not only as system engineering, but as inseparably connected with practical types of knowledge, the ability to use guidelines with discernment in concrete clinical situations, and the inculcation of safety dispositions, practical routines and a critical sense. The book ends by advancing a return to a more normative understanding of medical practice, where evaluating, taking responsibility for and forgiving or blaming medical errors within the medical community are approached as the moral structure that supports learning through modification of dispositions and establishment of the limits of office.

Notes

1. http://www.who.int/patientsafety/about/en/index.html.
2. http://en.wikipedia.org/wiki/Patient_safety_organization.
3. Danish hospitals are governed by five national regions, while 98 Danish municipalities run the primary care.
4. http://patientsikkerhed.dk/en/.
5. The Danish patient safety policy programme is only one of several parallel systems for the governance of medical errors in Danish healthcare, which also comprises systems for patients' rights and complaints, supervisory functions and patient insurance and compensation. Of these functions, the publicly funded compensation scheme is run by the Danish Patient Compensation Association separately from the complaints system. As for the remaining functions they have been merged since 2011 and in the fall

of 2015 the Danish Patient Safety Authority was formed to administer incident reporting, the patient complaints system and the supervisory authorities.

6. See the Law on Health, Act No. 288 of 15/04/2009.
7. The Danish Institute for Health Services Research (DSI), now part of The Danish Institute for Local and Regional Government Research (KORA), co-financed my PhD project, which has laid the groundwork for this book. As part of this arrangement, I conducted a pilot study for The Danish Society for Patient Safety of 'adverse events' in elderly care units (see Jensen and Pedersen 2010).
8. In total, the ethnographic material for this book comprises a total of around 300 hours of observation and interviews with 28 people. All quotes from the fieldwork are translated from Danish.

References

Allen, D., Braithwaite, J., Sandall, J., & Waring, J. (2016). Towards a sociology of healthcare safety and quality. *Sociology of Health and Illness, 38*(2), 181–197.

Aristotle. (2000). *Nicomachean ethics* (R. Crisp, Ed.). Port Chester, NY: Cambridge University Press.

Baker, G. R., Norton, P. G., Flintoft, V., Blais, R., Brown, A., Cox, J., et al. (2004). The Canadian Adverse Events Study: The incidence of adverse events among hospital patients in Canada. *CMAJ: Canadian Medical Association Journal, 170*(11), 1678–1686.

Becker, H. S. (1998). *Tricks of the trade: How to think about your research while you are doing it*. Chicago: The University of Chicago Press.

Berg, M. (1997). *Rationalizing medical work: Decision-support techniques and medical practices*. Cambridge, MA: MIT Press.

Bosk, C. L. (1979/2003). *Forgive and remember: Managing medical failure* (2nd ed.). Chicago: The University of Chicago Press.

Braithwaite, J., Wears, R. L., & Hollnagel, E. (2015). Resilient health care: Turning patient safety on its head. *International Journal for Quality in Healthcare, 27*(5), 418–420.

Brennan, T. A., Leape, L. L., Laird, N., et al. (1991). Incidence of adverse events and negligence in hospitalized patients: Results from the Harvard Medical Practice Study I. *New England Journal of Medicine, 324*, 370–376.

Brewin, T. (1994). Primum non nocere? *Lancet, 344*, 1487–1488.

Conway, J. B., & Weingart, S. N. (2005). Organizational change in the face of highly public errors—I. The Dana-Faber Cancer Institute experience. *Perspectives on Safety*, Patient Safety Network, Agency for Healthcare Research and Quality, US Department for Health and Human Services.

Currie, G., Waring, J., & Finn, R. (2008). The limits of knowledge management for UK public services modernization: The case of patient safety and service quality. *Public Administration, 86*, 363–385.

Davis, P., Lay-Yee, R., Briant, R., et al. (2002). Adverse events in New Zealand public hospitals I: Occurrence and impact. *The New Zealand Medical Journal, 115*(1167), 1167–1172.

Dekker, S. (2012). *Just culture: Balancing safety and accountability* (2nd ed.). Farnham, London: Ashgate Publishing Ltd.

Department of Health. (2000). *An organisation with a memory: Expert group report*. London: Department of Health.

Dewey, J. (1916/1966). *Democracy and education: An introduction to the philosophy of education* (1st paperback ed.). New York: The Free Press.

Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York: Promentheus Books.

Dewey, J. (1938). *Logic: The theory of inquiry*. New York: Henry Holt & Co.

Dewey, J., & Bentley, A. (1949). *Knowing and the know*. Boston, MA: The Beacon Press.

Du Gay, P., & Vikkelsø, S. (2013). Exploitation, exploration and exaltation: Notes on a metaphysical (re)turn to 'one best way of organizing'. *Research in the Sociology of Organizations, 37*, 251–281.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry, 12*(2), 219–245.

Fox, R. (1957). Training for uncertainty. In R. K. Merton, G. Reader, & P. L. Kendall (Eds.), *The student-physician: Introductory studies in the sociology of medical education* (pp. 207–241). Cambridge, MA: Harvard University Press.

Hollnagel, E., Braithwaite, J., & Wears, R. (Eds.). (2013). *Resilient health care*. Surrey, London: Ashgate Publishing Ltd.

Hollnagel, E., Wears, R., & Braithwaite, J. (2015). *From Safety-I to Safety-II: A white paper*. The Resilient Health Care Net, Published by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia.

Holmes, S. (2009). In case of emergency: Misunderstanding tradeoffs in the war on terror. *California Law Review, 92*(2), 301–356.

Hunter, I. (2006). The history of theory. *Critical Inquiry, 3*, 78–112.

Jeffcott, S., Ibrahim, J., & Cameron, P. (2009). Resilience in healthcare and clinical handover. *Quality and Safety in Health Care, 18*, 256–260.

Jensen, C. B. (2008). Sociology, systems and (patient) safety: Knowledge translation in healthcare policy. *Sociology of Health & Illness, 30*(2), 309–324.

Jensen, E. B. (2004). *Root cause analysis: Compendium for use by patient safety officers and others responsible for conducting root cause analysis of adverse events*. Copenhagen: Dansk Selskab for Patientsikkerhed.

Jensen, M. L., & Pedersen, K. Z. (2010). *Utilsigtede hændelser i den kommunale plejesektor*. Copenhagen: DSI.

Jerak-Zuiderent, S. (2012). Certain uncertainties: Modes of patient safety in healthcare. *Social Studies of Science, 42*(5), 732–752.

Jonsen, A. R., & Toulmin, S. (1988). *The abuse of casuistry: A history of moral reasoning*. Berkeley: University of California Press.

Khatri, N., Brown, G. D., & Hicks, L. L. (2009). From a blame culture to a just culture in health care. *Health Care Management Review, 34*(4), 312–322.

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To err is human: Building a safer health system*. Committee on Quality of Healthcare in America, Institute of Medicine. Washington, DC: National Academy Press.

Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Milton Keynes: Open University Press.

Latour, B., & Woolgar, S. (1979). *Laboratory life: The social construction of scientific facts*. Beverly Hills, CA: Sage.

Law, J. (2000). *Ladbroke Grove: Or how to think about failing systems*. Centre for Science Studies, Lancaster University, UK. Retrieved June 29, 2013, from http://www.comp.lancs.ac.uk/sociology/papers/Law-Ladbroke-Grove-Failing-Systems.pdf

Leape, L. L. (1994). Error in medicine. *JAMA: The Journal of the American Medical Association, 272*(23), 1851–1857.

Leape, L. L. (1997). A systems analysis approach to medical error. *Journal of Evaluation in Clinical Practice, 3*(3), 213–222.

Leape, L. L., Brennan, T. A., Laird, N., et al. (1991). The nature of adverse events in hospitalized patients: Results of the Harvard Medical Practice Study II. *New England Journal of Medicine, 324*(6), 377–384.

Leape, L. L., Woods, D. D., Hatlie, M. J., et al. (1998). Promoting patient safety by preventing medical error. *JAMA, 280*(16), 1444–1447.

Mesman, J. (2008). *Uncertainty and medical innovation: Experienced pioneers in neonatal care*. Basingstoke, UK: Palgrave Macmillan.

Mesman, J. (2009). The geography of patient safety: A topical analysis of sterility. *Social Science & Medicine, 69*(9), 1705–1712.

Miller, P. (1990). On the interrelations between accounting and the state. *Accounting, Organizations and Society, 15*(4), 315–338.

Miller, P. (1991). Accounting innovation beyond the enterprise: Problematizing investment decisions and programming economic growth in the UK in the 1960s. *Accounting, Organizations and Society, 18*(8), 733–762.

NHS. (2008). Root Cause Analysis Investigation Tools: Guide to investigation report writing following Root Cause Analysis of patient safety incidents. National Patient Safety Agency.

Nielsen, AJ (2010). *Travelling technologies and transformations in healthcare*. PhD Series, Copenhagen Business School, Copenhagen.

Paget, M. (1988). *The unity of mistake: A phenomenological interpretation of medical work*. Philadelphia: Temple University Press.

Perrow, C. (1972/1979). *Complex organizations: A critical essay* (2nd ed.). New York: McGraw-Hill Publishers.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.

Power, M. (1997). *The audit society: Rituals of verification*. Oxford: Oxford University Press.

Power, M. (2007). *Organized uncertainty: Designing a world of risk management*. Oxford: Oxford University Press.

Power, M., Scheytt, T., Soin, K., & Sahlin, K. (2009). Reputational risk as a logic of organizing in late modernity. *Organization Studies, 30*(2/3), 301–324.

Reason, J. (1990). *Human error*. Cambridge: Cambridge University Press.

Rose, N., & Miller, P. (1992). Political power beyond the state: Problematics of government. *British Journal of Sociology, 43*(2), 172–205.

Rosenthal, M. M. (1995). *The incompetent doctor: Behind closed doors*. Philadelphia: Open University Press.

Rowley, E., & Waring, J. (2011). Introduction: A socio-cultural perspective on patient safety. In E. Rowley & J. Waring (Eds.), *A socio-cultural perspective on patient safety* (pp. 1–12). London: Ashgate Publishing Ltd.

Schiøler, T., Lipczak, H., Frølich, A., et al. (2001). *Utilsigtede hændelser på danske sygehuse*. Copenhagen: DSI.

Smith, C. M. (2005). Origin and uses of *Primum Non Nocere*—Above all, do no harm! *The Journal of Clinical Pharmacology, 45*, 371–377.

Strauss, A. L., Faugerhaugh, S., Suczek, B., & Wiener, B. (1985). *Social organization of medical work*. Chicago and London: University of Chicago Press.

Svenningsen, S. (2003). *Electronic patient records and medical practice: Reorganization of roles, responsibilities, and risks*. PhD Series 10.2003, Copenhagen Business School, Copenhagen.

The Danish Patient Safety Authority. (2017). Dansk Patientsikkerhedsdatabase Årsberetning 2016. Styrelsen for Patientsikkerhed, Copenhagen.

Thorpe, K. E. (2004). The medical malpractice 'crisis': Recent trends and the impact of state tort reforms. *Health Affairs*, Web exclusives, W4-20-30.

Timbs, O. (2007). Introducing the idea of fair blame. *The Pharmaceutical Journal, 279*(Suppl.), B37–B38.

Van Fraassen, B. C. (2002). *The empirical stance*. New Haven, CT and London: Yale University Press.

Vincent, C. (2010). *Patient safety* (2nd ed.). BMJ Books. West Sussex, UK: Blackwell Publishing.

Vincent, C., Burnett, S., & Carthey, J. (2013). *The measurement and monitoring of safety: Drawing together academic evidence and practical experience to produce a framework for safety measurement and monitoring*. London: The Health Foundation.

Vincent, C., Neale, G., & Woloshynowych, M. (2001). Adverse events in British hospitals: Preliminary retrospective record review. *British Medical Journal, 322*(7285), 517–519.

Waring, J., Allen, D., Braithwaite, J., & Sandall, J. (2016). Healthcare quality and safety: A review of policy, practice and research. *Sociology of Health and Illness, 38*, 198–215.

WHO. (2004). *World alliance for patient safety*. Geneva: World Health Organization.

WHO. (2005). *World alliance for patient safety: Draft guidelines for adverse event reporting and learning systems. From information to action*. Geneva, Switzerland: World Health Organization.

Wilson, R. M., Runciman, W. B., Gibberd, R. W., et al. (1995). The quality in Australian health care study. *The Medical Journal of Australia, 163*(9), 458–471.

Woodward, H., Lemer, C., & Wu, A. (2009). An end to the witch hunts: Responding to the defenders of blame and shame: A commentary on Collins, Block, Arnold and Christakis. *Social Science and Medicine, 69*(9), 1291–1293.

Wu, A. (2000). Medical error: The second victim. *British Medical Journal, 320*, 726–727.

Zuiderent-Jerak, T., Strating, M., Nieboer, A., & Bal, R. (2009). Sociological refigurations of patient safety: Ontologies of improvement and 'acting with' quality collaboratives in healthcare. *Social Science & Medicine, 69*(9), 1713–1721.

2

The Oral Syringe Case

The best way to get familiarized with the patient safety programme and its ideals of standardization, simplification and failsafe systems is by empirical example. The case chosen to serve this purpose can, from the outset, be characterized as a managerial success in which the safety programme worked as intended. At the medical centre at the large Danish university hospital where I did the primary fieldwork for this book, a few incidents about a rare but very serious problem had been reported to the critical incident-reporting system: During the administration of (liquid) drugs for oral administration, the drug was by accident injected into the patient's veins. A mix-up between intravenous (IV) and per os (PO) drugs—a so-called wrong-route administration—is a potentially grim situation, as the effect of any medication is boosted when injected directly into the blood of the patient via infusion rather than working from the stomach as when given by mouth or feeding tube. IV drug administration is known to be one of the most dangerous medical practices because of a higher risk of errors, which can often have severe adverse effects for the patients involved (Westbrook et al. 2011; Taxis and Barber 2003). Wrong-route administration is also a perfect example of the type of errors based on human

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7_2

factors such as inattention, forgetfulness and memory-slip, which are often a major focus of attention for patient safety efforts in healthcare.

On the basis of the reported incidents of PO/IV wrong-route administrations, the patient safety representatives and risk managers in the medical centre decided that a new device should be introduced, namely, a special syringe for oral administration that would make it impossible for the individual healthcare worker to err as this syringe cannot be used for IV therapy. An oral syringe is a well-known systemic solution in patient safety literature (Dyer and Bryan 2011; National Patient Safety Agency 2007) and, in line with dominant patient safety thinking, this failsafe device has the ability to 'protect' the patient from the slips and cognitive insufficiencies of health professionals and thus to fix the identified safety problem.

On the face of it, the introduction of the new failsafe system was a success. The safety representatives at ward level initiated a strong cultural change agenda by which they succeeded in getting most nurses to use the new syringes. A patient safety representative working at the paediatric clinic even emphasized that the introduction of oral syringes was their most successful patient safety initiative:

> Success story no. one is those damn oral syringes. It's the most successful experience we've had, because it has moved something, and they are being used now, and people can see the sense of it. So in many respects it's a great success. There are still some of our nurses that do not use them, but eight out of ten use them now, and I'm more than satisfied. We cannot expect it to be a one hundred per cent success.

So, it seems, the syringes were successfully implemented. Moreover, after the introduction of the syringes, the medical centre had not received any reports of PO/IV mix-ups. On important parameters, then, this was a safety intervention just after the book: It attested to a well-functioning incident-reporting system; to a responsive system for reacting to incident reports; to an organizational capacity for 'systems thinking' and for intervention; to a successful dissemination and implementation process; and not least to an apparent elimination of the safety problem (taking into account that not every wrong-route incident is necessarily reported). It seems, then, that the failsafe mission was accomplished: Due to a

well-functioning system for reporting and responding to critical incidents, the health system learned from the incident and prevented future incidents of a similar kind.

Well, so it seemed. With a few scratches on the surface of the success, however, a new story appeared containing a number of organizational problems, unintended consequences, new types of risks and safety treats, and more fundamental changes to clinical practices and in structures of medical responsibility. Most noticeably, the introduction of the oral syringes led to concrete organizational and managerial problems. For instance, a storage problem emerged: As there was no central storage space in the hospital for the new syringes, they had to be stored at each clinic. The storage problem led to a technical problem. As the syringes were not stored in the hospital's main storage, they could not be handled via the normal order system, but had to be ordered separately. This was inconvenient, time-demanding and complexity-inducing and it increased the risk of the syringes not being ordered at all, which had happened occasionally after their introduction.

In addition to the organizational problems, a very concrete new patient safety problem arose: When a patient fed by tube was to receive a drug for oral administration, normally the syringe would be easily attached to the tube, but as it turned out, the new oral syringes were expanding the tubes, with the result that, on a number of occasions, the patient's gastric contents flowed out. It was therefore suggested that new tubes be introduced to fit the new syringes. This solution, however, led to an economic problem: The only tube on the market that could fit the new syringes was 13 times more expensive than the original tube. Therefore, another cheaper but less ideal solution was chosen: A little red transfer pipe was added to the oral syringes every time they were attached to a tube. This in turn created what could be determined as a complexity problem as the transfer pipe introduced a new layer of complexity into the oral administration procedure; and it is old news within safety studies that a high level of organizational complexity can increase the chances of things going wrong (see Perrow 1984).

So far, the problems listed are internal to the hospital centre but a number of inter-organizational problems should be mentioned as well.

As described by the medical centre's quality coordinator, delivery and coordination challenges at the regional level made for other types of problems, uncertainties and system incoherencies.

> Well, there've been a great many people involved in those oral syringes; many who are working at getting it introduced. We had to choose a system which could give us regular deliveries but only one company in Denmark could deliver them. This is a different company from the one that makes the tubes. And the regional working groups are also split up in one for syringes and one for tubes, and I don't know how the coordination is between them. So well, it's uphill, so to speak, and I think actually this example illustrates some of the really big challenges in relation to patient safety.

So while the patient safety representative who works at the ward level described the introduction of the syringes as a big success, the quality coordinator who works at the centre level described it as illustrating the 'big challenges' in relation to patient safety, and indicated that because of the high number of unanticipated difficulties, coordination and new safety problems, an unavoidable question of prioritization follows: Could the enormous number of man-hours and resources going into the introduction of oral syringes have been used better?

The Limits of Failsafe Organizing: Reintroducing the Wider System

In recent years, sociologists, organizational theorists, Science and Technology Studies scholars and safety engineers alike have started to engage more critically with the failsafe systems approach of the patient safety programme. Although there are important differences between the sociological and the safety science alternatives (Pedersen 2016, see also Chap. 7), they agree on one important parameter, namely that the 'systems perspective' of the current patient safety programme is either insufficient or fundamentally flawed and should be supplemented or substituted with a different, more comprehensive and more complex understanding of health systems.

Social scientists argue that while the patient safety programme has focused mainly on the micro-level in terms of human and local factors' importance in shaping quality and safety in clinical interactions, the sociological perspectives can supplement, add layers to and in parts challenge this knowledge by attending to the wider infrastructure of healthcare delivery and the social, cultural and political factors that shape safety (Waring et al. 2016; Jensen 2008). Parallel to this, advocates of the resilience approach to safety science—Safety II—suggest that while it is believed that the mainstream approach brings us systems thinking, it does not (Dekker 2011; Hollnagel et al. 2013). One reason for this failure, it is suggested, is the lack of systems-thinking competences in healthcare: 'While some attention has been focused on health care at the systems level, most recent efforts engage safety at a lower level: process redesign or safety engineering. This is due in large part to the lack of systems safety skills and knowledge in the field' (Nemeth et al. 2008: 4). Resilience engineers therefore argue in favour of introducing 'real' complex systems thinking, skills and methodologies in healthcare organizations worldwide (e.g., Hollnagel et al. 2013, 2015; Braithwaite et al. 2015).

The oral syringe case can to some extent illustrate these critiques: By approaching safety through reengineering efforts related to local conditions and human errors only, the wider and more complex infrastructure of healthcare delivery is left out of the equation, including questions of politics, economics and coordination between subsystems. The discrepancy between approaching the case from the local level and approaching it with a view to the wider system of healthcare organization is the most important parameter in determining whether the initiative should be understood as successful or not. On the ward level, the syringes are described as 'the most successful experience we've had' but at the centre level and with a view to the system of health-technology supply, delivery and coordination at the regional level, the syringes are understood as illustrating 'some of the really big challenges in relation to patient safety'.

This question of success and the ambiguity regarding when a safety intervention can be determined as a success point to a related area of critique concerning the notion of safety culture. Sociological approaches argue that the understanding of culture in patient safety is simplistic and superficial, not attending to the meanings and moral norms that

constitute it (Waring et al. 2016; Waring 2007). One way this simplicity is reflected is in the fact that in patient safety policy—as in other similar policy areas—a change of culture is often assessed by the degree of implementation and use of the policy measures. From this perspective, 'safety culture' equals a successful implementation process that overcomes resistance towards change in the organization and persuades the employees to adopt a blame-free perspective, disclose and report errors and think in terms of system reengineering. And in concrete instances of technology implementation, success is evaluated in terms of the health professionals' adoption of the new technology. As uttered by the patient safety representative, the oral syringes are a great success in this respect: The health professionals changed their behaviour and adopted the new technology.

With a view to the organization of work tasks in the clinic, this change of behaviour—although interpreted as a sign of learning culture—is not without its problems. With the change of behaviour the nurses' work practices became more complicated and time-consuming. With the new transfer pipe, oral drug administration procedures came to involve more steps and more equipment—and potentially more possibilities for things going wrong. In the meanwhile, the old syringes (now meant only for IV administration) could still be used without a transfer pipe for the tube, thereby weakening the incentive to use the new oral syringes. All this points to another type of critique uttered most strongly perhaps by Charles Perrow in his *Normal Accidents* (1984). Perrow suggests that problems and alterations caused by safety management have the potential to *reduce* safety in certain ways, not least because safety fixes often lead to new types of complexity or reduction of slack in the organization.

That the oral syringes were successfully introduced and that the nurses started using them, in spite of the various difficulties the new safety system imposed, is an indication of the simple but often neglected fact that successful implementation and a high level of adaptation and use—often identified as safety culture—are hardly a guarantee for the success or failure of a technology on a number of other parameters. In the case of the oral syringes, a long list of technical, economic, coordination, prioritization and new safety problems runs parallel to the 'successful implementation' of the syringes. To this should be added the more subtle

and invisible reorganization of medical practice that is an often unwanted consequence of the failsafe ideal.

The mentioned alternative approaches to patient safety unanimously suggest that the mainstream approach is restricted; the understanding of health systems, culture and risk exposed in the orthodox view demonstrates a simplistic and incomplete understanding of organizational reality. As the case of the oral syringes attests, what might seem a failsafe solution from a 'micro-perspective' is likely to look less failsafe when the wider healthcare system is included in the equation. And what might seem a success from an implementation or 'cultural change' perspective can appear less successful when accounting for the unintended consequences of the safety initiative in terms of the introduction of new types of uncertainties, safety threats and task complexities. In different ways, then, the case of the oral syringes attests to the limits of failsafe organizing; it demonstrates that failsafe organizing is likely to be only partially viable or successful depending on the parameters on which success is judged, on the definition of the system in question and on the amount of unintended consequences included in the equation.

Failsafe Fantasies and Safety Dispositions

These types of critiques of the current patient safety programme are highly relevant. It is of utmost importance to show and argue—by different means and in different ways—that the failsafe fantasies of mainstream patient safety thinking are not feasible. What is equally important, however, is to ask not only what the limitations of these fantasies are but also what their consequences could be. What happens when the ideal of the failsafe vision is used to organize healthcare practice? What are the consequences of striving towards the thoroughly reengineered healthcare system? And how are healthcare practices, medical reasoning, slowly developed routines, responsibility structures and professional obligations affected by this faith in failsafe organizing and the ideological, organizational and managerial practices that support this ideal? These are questions that are not easily answered as such effects are often not readily visible but consist of small displacements of organizational focus,

unnoticeable redistribution of professional responsibility, minor alteration of normative boundaries, subtle changes in roles, conduct and work tasks, and slightly transformed conditions for clinical discretionary practices. While sociological work in the area of patient safety has been said to address the 'meso and macro dimensions of safety, rather than the more micro world of group psychology, technology and practice' (Waring et al. 2016: 207), the question asked here is different: It concerns the consequences of the particular 'failsafe' way of organizing the 'micro-level' of medical practice, technology, group dynamics and professional conduct.

Returning to the oral syringe case with these questions in mind, some less visible and more tentative effects on clinical work and the conduct of healthcare professionals appear. One way to explore this is by attending to the existing clinical practices that the new safety system is meant to replace: in this case, the nurses' practices of drug administration, and not least their routines in relation to checking the drug label before they administer it to a patient. When this routine is missed, the chances that a drug will be administered incorrectly increase. Traditionally, one would expect this problem to have been addressed as a problem of strengthening and inculcating drug administration duties and obligations through the training of skill and routine in handling medication. With the new safety paradigm, however, training is mostly labelled as a weak safety solution, as it is directed at changing humans rather than optimizing systems. One can therefore reasonably reflect on what happens to the question of duty, responsibility, skill and properly trained routine in drug administration when the new failsafe system for oral drug administration and others like it are in place. Could it be, for instance, that with the use of oral syringes, the nurse at the bedside is less likely to check the drug label before injecting because it feels unnecessary with the new error-proof oral syringe?

To support such a possibility, another version of the same dilemma should be brought forth. During research at the hospital centre, I was made aware of an alternative variant of the wrong-route scenario, now between intramuscular (IM) and IV medication. As with the PO/IV case, it is a serious affair if a strong drug that is supposed to work from the muscle (IM) is injected directly into the vein (IV). At the paediatric

clinic, this safety issue was particularly prominent when children were handed over for surgery. Since the nurses at the surgical clinic normally only administered IV drugs, wrong-route incidents were more likely to happen here than at the paediatric clinic. The reason for this difference, I was told, was to be found in the paediatric nurses' substantial experience and routine in administering a great variety of drugs with the consequence that the vital procedure of always checking the label on the administered drug was well established here. In other words, it seemed that drug administration was safer here because of the experience, training and routine of the paediatric nurses; they had developed and internalized what I define as 'safety dispositions' or—with John Dewey—'intelligent habits' (1922) in relation to drug administration (see Chaps. 6 and 9). The surgical nurses, however, did not have the same experience.

The possibility of mix-ups between IM and IV drug administration casts new light on the oral syringe initiative. Concretely, it is obvious that while the new syringes might reduce the wrong-route incidents between PO and IV drugs, it does not solve the IM/IV dilemma. And as it is well known that safety systems can give a sense of security as well as lower elements of discretion and alertness, they might even have the opposite effect: With the introduction of the failsafe system for oral administration, the nurses' incentive for maintaining the checking routine is reduced with the possible result that other types of errors become more likely, including IM/IV wrong-route incidents. From this perspective, then, the case hints at the danger of neglecting the importance of experience-based, internalized and slowly developed routines for the delivery of safe care, and it hits at how the failsafe vision of the patient safety programme risks challenging the development and nurture of local safety dispositions.

The remainder of this book deals with the themes introduced by this case. It deals with the failsafe vision of the patient safety programme; the many assumptions about systems, risks and humans this vision is based on; and the specific type of solutions it introduces into healthcare practices. Simultaneously, it investigates the limits of failsafe organization and considers the unwanted consequences of failsafe rationalities and technologies for pragmatic safety practices, rehearsed routines, internalized safety dispositions and practical kinds of knowledge that are a vital part of delivering safe care in concrete clinical situations.

References

Dekker, S. (2011). *Drift into failure: From hunting broken components to understanding complex systems*. Burlington, VT and London: Ashgate Publishing Ltd.

Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York: Promentheus Books.

Dyer, C., & Bryan, G. (2011). Devices designed to avoid wrong route administration of drugs. *Anaesthesia, 66*(12), 1181–1182.

Hollnagel, E., Braithwaite, J., & Wears, R. (Eds.). (2013). *Resilient health care*. Surrey, London: Ashgate Publishing Ltd.

Hollnagel, E., Wears, R., & Braithwaite, J. (2015). *From Safety-I to Safety-II: A white paper*. The Resilient Health Care Net, Published by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia.

Jensen, C. B. (2008). Sociology, systems and (patient) safety: Knowledge translation in healthcare policy. *Sociology of Health & Illness, 30*(2), 309–324.

National Patient Safety Agency. (2007, March 28). Promoting safer measurement and administration of liquid medicines via oral and other enteral routes. *Patient Safety Alert, 19*, 1–12.

Nemeth, C., Wears, R., Woods, D., et al. (2008). Minding the gaps: Creating resilience in health care. In K. Henriksen, J. B. Battles, M. A. Keyes, et al. (Eds.) *Advances in patient safety: New directions and alternative approaches* (Vol. 3: Performance and Tools). Rockville, MD: Agency for Healthcare Research and Quality

Pedersen, K. Z. (2016). Standardization or resilience? The paradox of stability and change in patient safety. *Sociology of Health and Illness, 38*(7), 1180–1193.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.

Taxis, K., & Barber, N. (2003). Causes of intravenous medication errors: An ethnographic study. *Qual Saf Health Care, 12*, 343–348.

Waring, J. (2007). Doctors' thinking about 'the system' as a threat to patient safety. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine, 11*(1), 29–46.

Waring, J., Allen, D., Braithwaite, J., & Sandall, J. (2016). Healthcare quality and safety: A review of policy, practice and research. *Sociology of Health and Illness, 38*, 198–215.

Westbrook, J. I., Rob, M. I., Woods, A., et al. (2011). Errors in the administration of intravenous medications in hospital and the role of correct procedures and nurse experience. *BMJ Quality & Safety, 20*(12), 1027–1034.

3

Failsafe Systems and Practical Reasoning

Current patient safety thinking is dominated by a highly principle-based stance on safety management and medical knowledge that largely dismisses 'old ways' of understanding medical culture and improvement practices, and promotes a number of supposedly 'scientific' views instead. These are views that are based on a language of safety science, evidence, cause–effect relations, root causes, as well as a number of invariable management principles and an unyielding interventionist optimism. The new principles of safety management are brought forth by a strong faith and enthusiasm, as well as by a number of standardized and internationally spread organizational models and safety methodologies, which deliver readily implementable answers to the problem of patient safety.

Although the actual evidence of the positive effects of the programme's massive efforts are disputed (Hollnagel et al. 2015; Grol et al. 2008; Landrigan 2010), the ideals of invariable replicability, the methodological reliance on cause–effect relations, the ideal of prevention through standardization and the recurrent references to 'safety science' have provided the programme with a powerful scientific image and language. Moreover, the certainty by which the systemic perspective on patient safety and its safety science solutions are promoted does not seem to be affected by the programme's apparent lack of results. In a recent podcast

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7_3

on the *Next Wave of Patient Safety* from the Institute for Healthcare Improvement (2017), the iconic Donald Berwick acknowledges that the programme is challenged on its results but simultaneously describes the following 'three wins' of the safety movement:

> We know that it happens: We understand that the rate of injuries to patients is high. We know why it happens: The science says that it is systems, which is good news because it means that we can redesign systems for safety, which is the job. And we know how to change it because we actually have growing number of examples—at the project level at least—of new designs that are far safer. (IHI 2017)

Thus, he further argues, when the patient safety programme has not achieved what it started out to do, it is not because of its particular approach to patient safety, but because this approach has still not been optimally implemented. For this there are reasons connected to economy in terms of an apparent displacement of the safety agenda by cost concerns as well as reasons connected with knowledge and science defined as a lack of spread in safety science approaches and a lack of skill in thinking safety as a systems property: We remain, Berwick argues, in many respects 'system illiterates' (IHI 2017).

Thus, by way of a strong faith in failsafe systems and standardization—and an equally widespread distrust in humans as guarantors for safe organizing—the safety programme has succeeded in introducing a knowledge paradigm for understanding healthcare practices in general and healthcare practice improvement specifically that converges with the prevailing understanding of medical knowledge as evidence-based. As Waring et al. describe,

> the 'cause and effect' logic of patient safety parallels a similar operating logic within clinical care, which says first, secure a diagnosis, and then treat the patient in line with assembled evidence or derived consensus. (2016: 203)

The 'scientific image' and the particular way of knowing and acting that forms the foundation of the patient safety programme thus resembles a classic tension between medicine as a science—generalizable and

evidence-based—and medicine as an 'art' involving practical skills and experienced-based discretionary practices from the health professionals. While the scientific stance is based in epidemiological research, statistic and probability, the more practical stance takes its point of departure in the clinical situation, and discusses how in these situations knowing and reasoning are necessarily a pragmatic, situational and time-dependent activity founded on experience-based intuitions, slowly accumulated habits, and interpretations and discernment in the use of rules and guidelines in individual cases. Importantly, this practical attitude does not dismiss the importance of biomedical knowledge and evidence in medicine; nor does it disregard the significance of research-based practices or the need for well-founded and practical rule-based solutions as one way of supporting the delivery of appropriate and safe care to patients. Rather, a practical or pragmatic stance draws attention to concrete mechanisms of knowing and acting that take place in clinical situations and that cannot be captured by more generalized and principle-based logics.

In this chapter, I first examine the particular ways of knowing, acting and organizing that characterize the attempt to enact safety science in healthcare. I describe my own meeting with the programme and its faithful advocates, and I attend to the most dominant tools used to disseminate safety knowledge and principles in health organizations. Here a particular understanding of medical and safety knowledge appears, based on principles of predictability, replicability, generality and causality. In the second part of the chapter, I present an important source for the development of the pragmatic stance of this book: namely, an attitude to knowing and acting in healthcare provided by practical philosophy, where medicine across research traditions has been presented as the paradigmatic example of practical reasoning. Here medical knowledge is understood as fallible, tentative, particular and as closely connected to the actions of the healthcare professionals, who through perception, description, reasoning and interpretation are pragmatically acting in between experience, rules and guidelines and personal judgements. Thus, a main tension is illustrated between the 'scientific' approach to knowledge of the safety programme and the more practical approach to knowing and acting that has traditionally been understood to characterize medicine *par excellence*.

A First Meeting: Enthusiasm and the Failsafe Vision

In 2009, when I was still new to the patient safety agenda, a fellow researcher and I were to conduct a pilot study for The Danish Society for Patient Safety, the main driver behind the introduction of patient safety policy in Denmark. The aim of the study was to investigate the character of what in Danish is referred to as *utilsigtede hændelser* (critical incidents[1]) in primary care. The pilot study was conducted just as the Danish Patient Safety Act was to be expanded to include primary care in 2010. The act had since 2004 made it mandatory for healthcare professionals in Danish hospitals to report critical incidents. Before we started on the research, the Society showed concerns as to whether researchers, who were not trained in the appropriate patient safety methods, ideas and languages, could be trusted to do research on patient safety. As a compromise, a one-day introductory course in 'patient safety' was arranged for us at the society's headquarters. This course was my first real acquaintance with the particular way of engaging, acting, talking and knowing that makes up patient safety as a 'discipline'.

A number of details immediately caught my interest. For one, learning the discipline of patient safety seemed to have as much to do with speaking the right way as with doing the right thing. And, as one would expect, becoming 'disciplined' in the patient safety language could not be achieved in a one-day crash course. As my colleague and I proceeded with our studies in the Danish nursing homes and home care services we struggled to adopt the new language rules that we had been taught. First, we had to remember to say and write *utilsigtet hændelse* (directly translated as unintended incident) and not error, mistake or failure, but it quickly became clear that the term caused our informants considerable confusion when we made them reflect upon its meaning in our pilot study. As one of the nurses explained, '80 percent of nursing is unintended. You arrive with a purpose but then the situation evolves and you find a way to tackle this new situation'. Other language challenges arose: In a mail correspondence with the Danish Society for Patient Safety, related

to the approval of the final report, a critical comment on the draft concerned our use of words:

> It is *very* important that the author's terminology corresponds exactly to the language that has been developed over the past 5–10 years, which means a lot to the development of patient safety culture. So please use the word *report* and not notify, declare, register, etc. (Original emphasis)

The argument behind this exercise of language control, and the wider logic behind the term 'patient safety culture' as it is used in the quote, is that in order to make healthcare professionals more inclined to talk about errors, it is necessary to shift focus from individual wrongdoing to systemic errors. Accordingly, words with 'negative' connotations, that is, words associated with individual responsibility or blame, should be replaced by neutral or 'systemic' terms. Thus, for instance, the healthcare worker is not to be approached as the 'cause' of errors but as the 'second victim' of adverse events or critical incidents, the patient being the first victim (Wu 2000).

Apart from the rhetorical exercises of patient safety, the second thing that struck me was the enthusiasm and engagement of the people working with patient safety. This enthusiasm, I came to learn, was not only a distinctive trait of the society's employees; it was also characteristic for the patient safety representatives, quality coordinators and risk managers that I met at the large university hospital where I did a large part of the fieldwork for this book. Enthusiasm, excitement and interventionist optimism have also been defining characteristics for most of the numerous patient safety conferences, educational events and introductory courses I have attended since 2008 and, from my experience, it characterizes almost everyone engaged in 'patient safety work'. Often these people are referred to in Danish as *ildsjæle*, that is, 'fiery souls' who are passionate about, engaged with and attached to the patient safety policy agenda, who speak the right language and who are working hard and energetically to promote the programme's failsafe ideology, key principles and programmatic rhetoric, as well as its specific technologies.

Enthusiastic advocacy is not a unique quality of the patient safety policy reform. As argued by Paul du Gay, recent programmes of public

sector reform implicate a certain 'ethics of enthusiasm', where employees in the public sector are expected to internalize and identify with particular policies to become 'committed champions for and enthusiastic advocates of those policies' (2008: 336). When patient safety seems to be an extreme case of such ethics, it can be partly explained by the seriousness and magnitude of the problem and partly by the impossibility of being against it: Patient safety, just like quality, is initially something everyone can agree on as important, an indisputable value to believe in and work towards. The indisputability, however, does not only concern the ideal of delivering safe care and treatment to patients, but also the inevitably of 'giving in to' the new way of conducting safety of the patient safety programme. Thus, at the backdrop of the programme's ideological ambitions is a strong narrative concerning the opposition between what is, for instance, referred to as the 'old way', the 'failed paradigm', the 'blame-and-shame mindset' and 'the new model', 'the new paradigm', 'an open culture', 'a blame-free mindset' and so forth (Woodward et al. 2009).

The enthusiasm, then, seems to be driven by a genuine interest in increasing the safety of patients; yet this interest is largely inseparable from a strong faith in the particular configuration of the safety programme and its overall failsafe ideology. Thus, the programme has succeeded in becoming internalized to a very large extent. Doing patient safety work is not merely another work task; it means adopting a world view, an ideology entailing a set of key assumptions, dominant doctrines, characteristic rhetoric and specific techniques concerning how to talk about and act in accordance with the programme's requirements. Doing patient safety work implies what we, with a popular reference to Foucault, have become accustomed to referring to as subtle forms of self-discipline and self-management. On the part of the individual, it entails intensive training, motivation and work of the self on the self to be part of the patient safety movement.

As our crash course and the mail correspondence indicate, it does not only take work on the part of the individual healthcare worker to change world views, but also on the part of the organization—a lot of work. It takes campaigns, courses, conferences and seminars; it takes training

programmes to get health professionals to adopt the blame-free ethos, speak the right language and think in terms of systems redesign. And it takes the management and control of anyone who clings to the 'old' language of blame and medical error, including the 'stubborn old physician', researchers such as myself and not least the press and the public. In addition to the 'ideological' work it takes just as much 'material' work to introduce and manage the specific safety technologies and methodologies. This large amount of work has occasioned the introduction of a new profession in healthcare, namely, that of patient safety representatives, quality coordinators and risk managers, who are the promoters and representatives of the new regime internally in the organization as well as to the outside through collaboration with national and international patient safety platforms and agencies.

The characteristics described so far—the enthusiasm, the strong ideology, the dismissal of 'old ways', the language and image of science—are all traits which have made Justin Waring refer to the safety programme as an orthodoxy (2009); i.e., a particular set of beliefs and a way of knowing that is commonly accepted and unquestioned in patient safety circles. In establishing and disseminating this orthodoxy, a number of tools have been of special importance. In the following, I present three of the most widely disseminated and influential of these. First, American Institute of Medicine's *To Err Is Human: Building a Safer Health System* (Kohn et al. 2000), which instituted the problem and laid out the main doctrines of the orthodoxy; second, the Swiss Cheese Model (Reason 1990; Reason et al. 2001) that displays the understanding of organizational reality and the faith in failsafe systems of the safety programme; and third, the root cause analysis (RCA) as the epitome method for 'closing safety gabs' in healthcare systems (Murphy et al. 2009; Jensen 2004; NHS 2008). Bringing forth these three powerful tools is naturally a reductionist move. What I wish to attain by this is to display the particular stance of the patient safety programme on healthcare systems, on medical practice and on safety solutions; this includes, among other things, a faith in failsafe systems, a particular view on human nature as essentially error-prone, a belief in error prevention through standardization and centralized managerialism, and a strong interventionist optimism.

To Err Is Human: The Book of Patient Safety

It is almost impossible to find mainstream literature on patient safety that does not begin by referring to the American Institute of Medicine's *To Err Is Human: Building a Safer Health System* (Kohn et al. 2000), which has functioned as the general frame of reference for the safety programme and which is widely considered as the document that 'finally gave scientific foundation to what is now the safety movement' (Donald Berwick for IHI 2017). The report established the importance and magnitude of the safety problem by suggesting that between 44,000 and 98,000 Americans die every year as a result of preventable medical error, and from here it laid out the direction for the institution of a new way of approaching errors and safety management in healthcare—a possible way to prevent these unnecessary deaths. The title *To Err Is Human: Building a Safer Health System* (Kohn et al. 2000) says a great deal about the assumptions and organizing principles of the patient safety agenda. For one, the title identifies human error as the main problem that needs to be addressed. And, as it becomes clear in the report, the title refers to a particular concept of human error developed within safety science and with inspiration from research of human factors, ergonomics and cognitive psychology (Reason 1990, 1997); namely, human error caused by human shortcomings such as cognitive failures, slips, inattention, fatigue and stress, but where latent conditions such as system failures or insufficiencies can often be said to be the underlying cause.

Yet the title has a dual meaning. It states not only that human errors should be in focus in patient safety efforts, but also that it is *human* to err; i.e., that mistakes and errors must be approached as an inevitable human characteristic, as part of the so-called human condition. As it is human to fail, it is also excusable, seems to be the argument. And therefore we need to stop going around pointing fingers at each other. This argument is built on the assumption that the most common response to error in healthcare is to blame and perhaps fire someone. In contrast, the blame-free approach is introduced, where the causes of error—including the human causes—are understood and should be addressed as systemic. The two first insights lead on to a third axiom to be taken from the title: To avoid human error, we need to build safer systems. As it is impossible

for humans not to err, and as human errors often have systemic causes, building safer systems is the only way forward. Or, as the perhaps most repeated quote from *To Err Is Human* states, '[t]he problem is not bad people; the problem is that the system needs to be made safer' (Kohn et al. 2000: 49). Thus, the safety programme's dominating methodology of collecting and analysing critical incidents should be understood in this light: as a way 'to understand where the system broke down, why the incident occurred and the circumstances surrounding the incident' (Kohn et al. 2000: 63–64). As for the type of solutions that should be implemented to optimize the system and prevent future errors, *To Err Is Human* is also in debt to human factors and safety science:

> Much of the work in human factors is on improving the human—system interface by designing better systems and processes. This might include, for example, simplifying and standardizing procedures, building in redundancy to provide backup and opportunities for recovery, improving communications and coordination within teams, or redesigning equipment to improve the human—machine interface. (Kohn et al. 2000: 63)

The movement from a so-called person to a system approach had been introduced by cognitive psychologist James Reason (1990, 1997, 2000), and it was, at the time of *To Err Is Human*, the most widespread method of approaching error management in high-risk industries, especially aviation. Moreover, a number of pioneering texts by, for instance, Lucian Leape, one of the movement's most influential founding fathers, had laid out the advantages of thinking in terms of system improvements in healthcare before the Institute of Medicine report (e.g., Leape 1994, 1997). It was, however, not until *To Err Is Human* that the new patient safety programme was inaugurated as an international policy programme that succeeded in putting system optimization on the health political agenda. As argued by Jensen, the seminal report and the reports that followed, most notably the British *An Organization with a Memory* (Department of Health 2000), did not only stimulate systems thinking in relation to patient safety but came to 'epitomise recent health policy thinking, in which what can be termed a system theoretical approach has become a leverage point for imagining interventions in healthcare' (Jensen 2008: 309). Thus, *To Err Is Human* became an important

instrument in disseminating the faith in failsafe systems that has come to dominate the improvement agenda in healthcare, in relation not only to patient safety but also to the wider field of healthcare quality.

The Swiss Cheese Model: The Organizational Model of Patient Safety

If *To Err Is Human* is *the* book of patient safety, the so-called Swiss Cheese Model is probably *the* visual image of the programme and its view on organizational reality, and the model has been of greatest importance for the successful dissemination of patient safety thinking and practice. The model is built on James Reason's accident causation model (1990), which illustrates the combination of active failures (unsafe acts) and latent conditions (systemic features such as poor design, procedures or management structures) needed to create an accident opportunity. In the model—or at least as it came to develop over the years (Reason 1997; Reason et al. 2001)—defence systems are illustrated as slices of Swiss cheese where each hole represents a weakness (active or latent failure). When the holes in the cheese slices align (illustrated by an arrow), an accident opportunity arises. Reason himself originally used the model to argue for 'the complex interaction' (1990: 208) between active failures and latent conditions, and he stressed that this complex interaction was not necessarily foreseeable or fully preventable (Fig. 3.1).

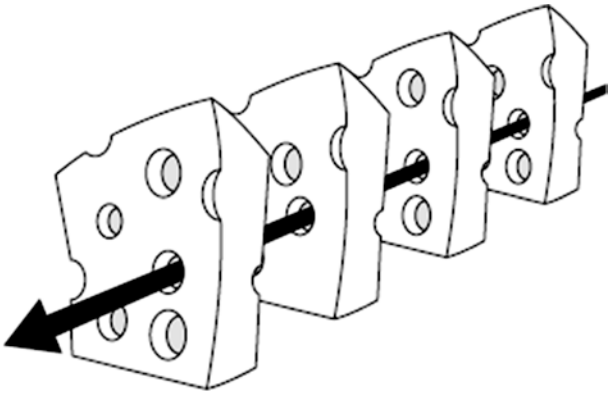


Fig. 3.1 Swiss Cheese Model

The common use of the Swiss Cheese Model has, however, often been to rely 'on interpretations of the model's semantics that went rather far beyond what was initially intended' (Reason et al. 2006: 2). Today more or less simplified versions of the model are displayed in the vast majority of patient safety conferences, seminars, educational events and mainstream patient safety textbooks; to such an extent that the constant recurrence of the popular image has almost become an internal joke between the patient safety movement's representatives. At many of the meetings and conferences I have attended during my fieldwork, the obligatory power point slide with the illuminating slices of cheese often provoked some kind of response either in the audience who would laugh or sigh with recognition or in the presenter who would make a slight excuse by accompanying the Swizz Cheese Model with something like: 'This image, that we have seen a million times before'.

A major reason for what Reason himself critically refers to as the 'enthusiastic use' of the model (Reason et al. 2006: 2) is that the image of the Swiss cheese is easily turned from a conceptual model of the complex interaction of errors into a rather illuminating illustration of an investigation method. Ultimately, safety management is about identifying and closing the 'holes' in seemingly stable defence systems. Additionally, the model combines the concepts of active failures, i.e., the '"unsafe acts" committed by those working at the sharp end of a system, which are usually short-lived and often unpredictable' (Department of Health 2000: ix) and latent conditions that 'are long-lived and, unlike many active failures, can be identified and removed before they cause an adverse event' (Department of Health 2000: ix). Here the most important safety management principles of *To Err Is Human* are combined in an instructive organizational model that illustrates how systemic and latent conditions (the holes in the cheese) need to be closed through redesign so active human errors are prevented.

The Root Cause Analysis: The Method of Patient Safety

What the Swiss Cheese Model does so well is to foster faith in the possibility of managing safety and creating failsafe systems: We simply need to identify and close the safety gaps in our defence systems. Hence, it

supports the two main technologies of the patient safety reform programme—incident reporting and incident analysis—both imported from high-risk industries such as aviation and nuclear power plants. In the quest to prevent errors through system redesign, incident reporting is understood as the main tool. As observed by WHO: 'The same mistakes occur repeatedly in many settings and patients continue to be harmed by preventable errors. One solution to this problem is reporting' (2005: 7).

Reporting systems, however, identify but do not 'solve' safety problems. For this purpose, the most popular and widespread safety technology is the RCA, which is to 'provide causal information to facilitate learning from serious adverse events and near misses and to produce an action plan to prevent recurrence where possible and reduce risks to future patients' (Department of Health 2001: 34). As 'a tool for identifying prevention strategies' and for 'preventing recurrence' (Murphy et al. 2009), the RCA serves as the epitomic methodology of the patient safety programme, where the main goal is to create error prevention (in relatively stable healthcare systems) through standardization and the introduction of failsafe systems.

Although the concrete outlines of different RCA models are slightly different, there is general agreement as to the basic philosophy and ingredients of the standardized method. In the RCA process, healthcare practices are understood through a strict linear rationality where the 'root causes' of a particular incident are identified by working backwards through a line of cause-and-effect trails. Practically, an investigation team conducts an RCA after the occurrence of a particularly grave safety incident with the goal of, first, establishing the so-called event sequence, which is determined as 'a precise chronological ordering of the chain of events that preceded the occurrence of an adverse event' (Jensen 2004: 14). Second, it identifies the root causes and contributing factors of the incident while ideally demonstrating 'a direct link between cause and effect' (NHS 2008: 10).

> Using the event sequence and contributory factors as a foundation, root causes are identified by drilling down through all the layers of a sequence of events to find its innermost core, that is, the actual root cause or causes of an adverse event that caused harm to one or more patients (Jensen 2004)

Based on this 'positivist' understanding of knowledge and the possibility of identifying 'root causes' it becomes relatively simple to develop action plans that ideally prevent recurrence. Technically, the root causes are identified 'through a series of "why" questions to determine where redesign might reduce risk' (Department of Health 2001: 39). Interestingly, a root cause is not any cause, but a cause to which a system solution can be identified. Thus, it is specified, for instance, that a root cause must be 'a finding related to a process or system that has a potential for redesign to reduce risk' (Joint Commission 2013: 1). In line with the human factors approach, the RCA is a blame-free procedure, which means, first, that blame is evaded as a procedural strategy; blame as well as inflammatory statements and negative descriptions should be avoided in order to make people want to attend the process (and thereby foster an open safety culture). Second, the blame-free approach is defining for the outcome of the process; by arguing (in line with the human factors approach/Swiss Cheese Model) that human error most often has an underlying cause that can be eliminated through system or process redesign, action plans should not be aiming at changing humans, but instead at changing the system. Therefore, recommendations are to be developed following a number of 'rules of thumb' that involve, on the one hand, increasing standardization by promoting, for instance, the 'intelligent use of checklists, policies and protocols', the 'simplification of tasks and processes', 'standardisation of tasks and processes', and, on the other, reducing human factors through 'minimal dependency on short-term memory and attention span', by 'avoidance of fatigue' as well as through understanding 'that retraining is not always the right solution' (NHS 2008: 11). In other words, when designing safety solutions, one has to 'forget things like "pay more attention" or "get more training". Instead, focus must be on putting knowledge "in the world through redesign"' (Murphy et al. 2009: 3).

On the basis of these advices, a ranking of the quality of safety solutions is established, where solutions that achieve error elimination are preferable. At patient safety conferences and events, this failsafe ideal is expressed with, for instance, an illustrative safety science–inspired chart in which error management strategies are displayed starting with the least effective, the strategy of 'handling error'. Here, measures such as training

and instructions are included. 'Facilitating error', where 'doing the right thing is made easier' and 'doing the wrong thing is made harder', is described as the second most effective way of dealing with errors, while 'elimination of error' is described as the most effective measure, where the risk of error is removed. This is done through the introduction of failsafe systems, standardization and simplification.

Thus, when the patient safety programme's objective is to put knowledge into the world through redesign (Murphy et al. 2009), it has certain consequences for the type of knowledge valued by the programme. This safety engineering approach is built on a strong faith in the possibility that healthcare systems—including the habits, routines, acts and clinical judgements of health professionals—can ultimately be determined by a tightly woven net of standards, guidelines and failsafe systems that is able to prevent (human) error. It is promoting a type of knowledge that is predictable, stable, generalizable and independent of context.

Yet, in concrete clinical situations, medical knowledge and safety knowledge is 'something less than a powerful, exact science, based on nicely invariant principles' (Fox 1957: 214). Rather it is a developing practice, where uncertainty and therefore error is an ever-present possibility, and where stability can never be predetermined. Thus, if safety and safety management are to be understood in these concrete situations, we need another concept of knowledge that puts the practical, situational and case-based aspects at the forefront while also accounting for the complex experience-based processes of combining the more generalized types of knowledge of evidence and best practice with the particular patient stories or concrete situations of unsafety in medical practice; that is, we need a concept of knowledge that captures the delicate structures of collaboration, experience-based habits, acquired skills, practised routines, practical ways of reasoning and safety dispositions of health professionals that secure safe treatment most of the time (see also Mesman 2008). An obvious place to look for such a concept of knowledge is in more classical descriptions of medical reasoning, particularly within practical philosophy. These practical accounts attend specifically to the interpretative, experience-based and moral processes whose rules and standards are related to individual cases through practical reasoning. This type of

reasoning is open, time-dependent and linked to the specificities of the situation and therefore never failsafe. Here, then, variation, discretion and the attitudes, experiences and habit of the individual health professional are part of the necessary knowledge base that secures appropriate care and safe thinking and acting in concrete clinical situations.

Medical Reasoning and Pragmatic Practices

In what follows I present authors within ethics and practical philosophy who have presented medicine as a paradigmatic example of practical, pragmatic and situated reasoning. These are chosen for their ability to bring us closer to an understanding of the complex relationship between different types of generalized and stabilized knowledge and the clinicians' personal attitudes, professional comportment, and habitual and experience-based ways of knowing and acting. By introducing a line of philosophers as diverse as Aristotle, John Dewey and Stephen Toulmin, who agree on several crucial characteristics of medical reasoning, I indicate how the practice of medicine through time and across research traditions has been viewed as a practical and situated way of thinking and acting, closely connected to terms such as clinical experience, observation, medical training and competence, as well as detailed description. Importantly, the argument I make here is not that medicine is the same today as in antiquity. As Foucault famously showed in his analysis of the birth of the clinical hospital in France in the late eighteenth century (1994/1973), this fundamental reorganization of medical practice led to new types of medical knowledge. By gathering patients in hospitals, instead of visiting them in their homes, a particular type of medical experience, based on the meticulous observation, description, comparison and classification of patients and their illnesses, was made possible. According to Foucault, it was this new type of medical experience that paved the way for gathering, juxtapositioning and analysing medical knowledge in increasingly scientific and quantifiable ways.

Despite considerable historical differences, what I attend to here is some of the similarities in the descriptions of the particular type of

situation- and case-based knowledge that necessarily characterizes the medical encounter and concrete clinical situations in spite of increased biomedical knowledge, statistics and evidence-based medicine. It describes the type of interpretative practices and necessary actions that take place when, for instance, information is only partial, and a patient's illness trajectory does not follow the statistical average. To illustrate let us start with a typical case from my hospital study.

A Medical Conference Case

The paediatricians meet at 8 am as usual for a Wednesday morning conference at the medical centre where I conducted the main fieldwork for this book. Today, as every Wednesday, a clinical case is presented for discussion. One of the younger paediatricians starts by referring to some general information about a patient's illness and reveals a few symptoms: The case concerns a five-year-old child, who was admitted to the hospital because of four days of vomiting; the child shows signs of back stiffness. The paediatrician pauses and asks the room: 'What do you think? Any suggestions?' One doctor suggests meningitis, another suggests septic shock. Relevant suggestions, the paediatrician implies, but not the correct answer. The paediatrician turns to the next slide, which shows the test results from the initial round of blood tests and the lumbar puncture. On the long list of test results, a few are of particular importance for the later diagnosis: One result shows that the lumbar puncture is clear, which rules out meningitis, but the cerebral perfusion pressure (CPP), which measures the blood flow to the brain, is 825, an extraordinarily high number. Moreover, it shows that sodium is low and calcium is high. The paediatrician asks again: 'Does anyone have a suggestion?' There is a discussion in the room and a couple of suggestions. The doctor describes the next developments in the case: The following day the patient's CPP is reduced to 290, and they are able to maintain the patient's conscious state. This information about apparent recovery seems to confuse the picture somewhat and initiates discussion. The game of giving a few details and posing questions goes on for a couple more slides, while colleagues debate possible diagnoses. Before turning to the last slide, the young pae-

diatrician states that now only the residents and younger doctors are allowed to answer, while the more experienced doctors must keep quiet. 'When you see this, what is your reaction?' she asks and lists a number of symptoms and signs including greyish colour, fatigue, nausea, abdominal pain and hypoglycaemia (low blood sugar). Most of the attendings now know the answer, and some of the younger paediatricians are also able to give a diagnosis: Addison's disease, a very rare and severe illness due to acute adrenal failure. The session is over in less than ten minutes, and the conference moves on to discussions of logistics and the handing over of important information on newly hospitalized patients.

This case illustrates what has traditionally been understood as the core of clinical knowledge and experience; namely, a particular kind of medical reasoning that is based on the observation and description of signs and symptoms in the individual patient. It also touches on a tension in medical knowledge that concerns, on the one hand, the ideals of general and scientifically based knowledge, presented here in the form of the correct diagnosis, clearly defined by describable signs and symptoms and, on the other hand, the inherent uncertainty of the diagnostic process. This relates first to its temporality: the fact that an establishment of diagnosis is temporal insofar as the facts of the case, as well as the symptoms of the patient, are only to be established temporarily at any point in time. In this case, the patient was, for several days, held in suspense and not clearly diagnosed. Second, the uncertainty relates to the situated and case-based character of medical knowledge; against the odds this particular patient, for instance, seemed to be recovering shortly after the hospital admission.

From this perspective, an account of medicine as 'a science of the particular' (Gorovitz and MacIntyre 1976) points towards the ambivalent relation in medicine between scientifically generalized knowledge and practical, partial and circumstantial knowledge. In descriptions of medical knowledge, the weight placed on each side of this divide has varied over time, and whereas contemporary medical knowledge is often defined in scientific and evidence-based terms, medicine has, traditionally, been understood as a paradigmatic case of circumstantial knowledge and practical reasoning.

Aristotle on Phronesis: Medical Reasoning as Practical Wisdom

The tradition of practical thinking has its origins in Aristotle's *Nichomachean Ethics* (2000 [approximately 350 BC]), which, perhaps due to Aristotle's father being a doctor, draws heavily on medicine and medical examples to illustrate the nature and methods of ethics (Jaeger 1957). When explaining, for instance, the insufficiencies in perusing the 'good-in-itself' when dealing with practical affairs, Aristotle agues 'that apparently it is not just health that the doctor attends to, but human health, or perhaps rather the health of a particular person, given that he treats each person individually' (Aristotle 2000: 10, 1097a). Later, in the discussion of individualizing education, he brings in another medical analogy: 'For though in general rest and abstinence from food are beneficial for a person in a fever, presumably they may not be for a particular person' (Aristotle 2000: 202, 1180b). By bringing in a medical example, Aristotle wishes to cast light on the particular characteristic of what he determines as *phronesis*, practical wisdom, which is the intellectual capacity belonging to our practical life rather than to *episteme*, often translated as scientific knowledge (to Aristotle, universal knowledge), which is 'distinguished by its objects, which do not admit of change; these objects are eternal and exist of necessity' (Aristotle 2000: 1139b). In opposition to this, Aristotle argues that when dealing with practical reason

> the accounts we demand should be appropriate to their subject matter; and the spheres of actions and of what is good for us, like those of health, have nothing fixed about them. Since the general account lacks precision, the account at the level of particulars is even less precise. For they do not come under any skill or set of rules: agents must always look at what is appropriate in each case as it happens, as do doctors and navigators. (Aristotle 2000: 25, 1104a)

In this way, practical reasoning—of which medicine is the paradigmatic example—is defined as a particular context-dependent way of knowing and thinking, which takes its point of departure in the particular case. It is only meaningful or appropriate in relation to its specific

subject matter, and is therefore never fixed: Knowledge based on practical rationality is developing and situated.

The concept of *phronesis* has inspired most practice-based and empirical-oriented philosophies, and it has often been the starting point for discussions of clinical rationality. Of notable interest, Kathryn Montgomery has delivered a thorough contemporary account of clinical judgement based on Aristotle's ethics. In *How Doctors Think: Clinical Judgment and the Practice of Medicine* (2005), she argues against the current dominant idea of medicine as a science. Instead, she addresses issues of contingency, uncertainty and circumstance in medical knowledge by determining practical reasoning as the 'flexible, interpretive capacity', which more than anything characterizes clinical judgement (Montgomery 2005: 5). The misrepresentation of medicine as a science and the ignorance of clinical judgement or practical reasoning as its 'chief virtue' (2005: 6) have serious consequences, Montgomery argues, not least in relation to questions of failures and bad outcomes (Montgomery 2009).

Dewey on Pragmatism: Medical Reasoning as Pragmatic Method

Aristotle's 'situational' ethics and his insistence on paying attention to the particularity of the case in practical matters has inspired American pragmatism and particularly the work of John Dewey (Pagan 2008). Like in Aristotle's writings, medicine is also in Dewey's work the example *par excellence* of pragmatic methods and reasoning. But whereas Aristotle maintains the difference between the scientist's and the physician's way of reasoning (partly due to the way science was defined in antiquity), Dewey sets out to describe how scientific practice and knowledge too are a practical endeavour based on pragmatic reasoning. In a description of the role of theory in research, for instance, Dewey argues by analogy to the relationship between procedures and the physician's individual methods:

> Take a case of a physician. No mode of behavior more imperiously demands knowledge of established modes of diagnosis and treatment than does his. But after all, cases are *like*, not identical. To be used intelligently, existing

> practices, however authorized they may be, have to be adapted to the exigencies of particular cases. Accordingly, recognized procedures indicate to the physician what inquiries to set on foot for himself, what measures to *try*. They are standpoints from which to carry on investigations; they economize a survey of the features of the particular case by suggesting the thing to be especially looked into. The physician's own attitudes, his own ways (individual methods) of dealing with the situation in which he is concerned, are not subordinated to the general principles of procedure, but are facilitated and directed by the latter. (Dewey 1916: 171)

Dewey evokes the medical example to illuminate the point that in actual clinical situations, procedures, guidelines and theories are not followed mindlessly, but are to be judged in relation to their operationality in the concrete case at hand. If procedures are used with discretion as tools to guide action, if the physician has 'acquired them as intellectual aids in sizing up the needs, resources, and difficulties of the unique experiences in which he engages, they are of constructive value' (Dewey 1916: 172). On the other hand, Dewey argues, if 'they get in the way of his [the physician's/researcher's] own common sense, when they come between him and the situation in which he has to act, they are worse than useless' (Dewey 1916: 172). He goes on to state about the physician: '[B]ecause *everything* depends upon his own methods of response, *much* depends upon how far he can utilize, in making his own response, the knowledge which has accrued in the experiences of others' (1916: 172).

This discussion about the relationship between generalized knowledge, particular situations and the individual's 'own response', or, in Aristotle's words, his practical wisdom is often rearticulated in Dewey's work, for instance, in *Logic: The Theory of Inquiry* (1938), where he thoroughly describes the difference between (general) propositions and (individual) judgements. In opposition to the Aristotelian notion of *episteme*, the generic or general is never unchangeable or fixed. Rather, 'universal' or generic propositions are empirically grounded, that is, they are based on practical experiences of previous conduct and inquiry, and, as such, propositions—no matter what kind—are always up for revision should future conduct require it.

> It is clear that all principles are empirical generalizations from the ways in which previous judgments of conduct have practically worked out. When this fact is apparent, these generalizations will be seen to be not fixed rules for deciding doubtful cases, but instrumentalities for their investigation, methods by which the net value of past experience is rendered available for present scrutiny of new perplexities. Then it also follows that they are hypotheses to be tested and revised by their future working. (Dewey 1922: 240–241)

Propositions, that is, theories, procedures, principles and so on, are always 'only' working hypotheses, which are to be tested in practice. They are only meaningful as 'formulations of possible ways or modes of acting or operating' (Dewey 1938: 264); that is, in their ability to guide action. The idea that even the most generic of our principles, rules and propositions are based on earlier experiences and are up for revision can also explain that Dewey prefers the notion of 'warranted assertability' for truth.

In the description of pragmatism's abductive approach, Dewey once again turns to medicine as an illustration. In the case of diagnosing two sick children,[2] who happen to be neighbours, Dewey argues that one should turn to an analytical comparison between the two cases. This comparison is to be effected 'by the operative use of a conceptual apparatus of if-then propositions: If diphtheria, then characteristic traits; if typhoid, then certain others; if measles, then certain others, and so on' (1938: 267). Hence, Dewey emphasizes with reference to a longstanding philosophical debate that 'it is not denied that we infer from one case to other cases' (1938: 268); however, 'such inferences have logical standing—or are grounded—only as the inference takes place through the mediation of propositions of the generic and of the universal form' (1938: 268). In this way, Dewey situates himself, as do the rest of the pragmatist philosophers, outside classic discussions about induction and deduction. Judgements, which are always 'individual' since they are 'concerned with unique qualitative situations' (1938: 283), are neither deductions from principles or procedures nor inductions from one case to another. Rather, a judgement such as the diagnosing act is *directed* by 'if-then' propositions through acts of what Dewey terms 'comparison contrast' (1938:

283), whereby the proposition's relevancy and usefulness are tested in practice.

Although it is primarily Dewey's more processual thinking that has achieved a contemporary revival, especially within poststructuralist traditions, it is important to notice how this necessary relationship between rules, procedures, judgements and individual cases inserts an awareness of the necessity of stability. In pragmatism rules, procedures, propositions and habits are all relatively stable structures based on earlier experience which are necessary to suggest and form particular 'ways or modes of acting' in concrete situations. And when such rules do not work for the particular task at hand, it is Dewey's attitude then that 'the choice is not between throwing away rules previously developed and sticking obstinately by them. The intelligent alternative is to revise, adapt, expand and alter them' (Dewey 1922: 239–240). This argument is echoed in the contemporary advocacy of casuistic methods by Jonsen and Toulmin, who have also emphasized the intricate relationship between rules and context by drawing parallels between medical, legal and moral reasoning.

Jonsen and Toulmin on Casuistry: Medical Reasoning as Case-Based Reasoning

In Jonsen and Toulmin's *The Abuse of Casuistry: A History of Moral Reasoning* (1988), medicine is used to illuminate 'the complex and subtle ways in which theoretical and practical knowledge bear on each other' (Jonsen and Toulmin 1988: 37). In this significant piece of work, they set out to rehabilitate the tarnished name of casuistry or case-based reasoning; a method used to analyse individual cases by comparing them to paradigmatic cases or principles and originally employed for settling moral and legal disputes. Casuistry was especially popular among theologians in late medieval and early modern Europe but was condemned for being equal to sophistry or moral relativism[3]; however, as shown by Jonsen and Toulmin, this critique does not do justice to the general intentions of the method, which is about letting detailed descriptions of the case or situation under scrutiny be the basis of the mapping of similarities

and differences to analogous and paradigmatic cases, which then dictates the way forward.

In their book, which initiated a revival of casuistic and case-based reasoning and methods, not least in relation to medicine (Arras 1991; Jonsen 1996; Khushf 2004), Jonsen and Toulmin define clinical medicine as 'the reflective use of medical judgment in dealing with the specific conditions of particular patients' (1988: 39); and they argue that medicine has a close affinity to moral practice (see also Chap. 9). With reference to *Nichomachean Ethics*, they describe how 'clinical knowledge requires what Aristotle calls "prudence" or *phronesis*: practical wisdom in dealing with particular individuals, specific problems, and the details of practical cases or actual situations' (Jonsen and Toulmin 1988: 37). In line with Aristotle and Dewey, Jonsen and Toulmin use the medical example to discuss different strands of knowledge and their combination, and they suggest that medicine is based on a subtle mix of scientific or generalized knowledge, practical procedures and the individual experiences and skills of the physician. The relationship between the latter two is described in this way:

> The central core of medicine […] comprises practical procedures designed not to explain health and disease in theory but to treat illnesses and restore health, as a matter of practice. These procedures are the medical profession's collective property: though general in form, they comprise general practical skills (technai, in Aristotle's terms) rather than belonging to theoretical science (episteme). At the other extreme are the skills that are the individual physician's personal property. A doctor's skill in handling his patients' medical problems demands not only knowledge about the general practical techniques of diagnosis and therapy but also specific and particular kinds of clinical understanding. The central question for him is always, "Just what specific condition is affecting this particular patient, and just what should we do about it, *here and now*?" (Jonsen and Toulmin 1988: 37)

As with Dewey, the specific relationship between the physician's individual skills and experiences, on the one hand, and procedures and more generalized forms of knowledge, on the other, is not one where the physician's judgement is subordinated to procedures, standards or scientific knowledge; clinical judgement is not a matter of deduction from general-

ized knowledge, but it 'relies heavily' (Jonsen and Toulmin 1988: 38) on scientific knowledge, which functions as an 'intellectual background to his clinical decisions' (1988: 39). Decisions and knowledge are thus not related 'by any strictly formal entailments but in more indirect, substantive ways' (1988: 43).

In some instances, in the paradigmatic cases, the link between generalized knowledge and the specific case is quite straightforward. In others, however, cases are 'less open to theoretical understanding, but they are no less typical elements of clinical practice' (1988: 39). And here, Jonsen and Toulmin argue, judgement is 'personal':

> The guarantees of medical objectivity do not, in practice, depend only on formal theoretical entailments: the strongest support for agreeing to a clinical diagnosis or a therapeutic proposal comes from substantive medical evidence. There is, of course, a germ of truth in the 'personal' view. In a given case, when the doctor accepts a scientific theory or clinical procedure, his decision is not a mere hunch or matter of taste, but typically it does remain a matter of *personal judgment*. What is the subject matter of this judgment? When a doctor reviews a medical history and pattern of symptoms, what exactly does he 'perceive'? We can define the object of clinical judgment more clearly if we think of this clinical perception as a kind of pattern recognition. (1988: 40)

This particular relationship between procedure (for instance evidence-based knowledge or particular safety procedures) and the individual physician's 'personal' judgement is strikingly close to Dewey's description of the relationship between propositions and 'individual' judgements. What determines both positions is the idea that, although personal or individual, the judgement is not subjective, as in random or 'a mere hunch or matter of taste'. Rather it is personal because it is linked to the persona of the clinician. The discretionary element of clinical judgement is part of the clinicians' instituted role and office, and it is inseparably linked to their skill, competence and training in handling individual cases.

To Jonsen and Toulmin, the particular kind of 'pattern recognition' on which clinical experience is based resembles in important ways the casuistic methods, which they have set as their task to rehabilitate. They argue,

for instance, that clinical diagnosis is based on a '*taxonomy* of known conditions and the paradigmatic cases that exemplify the various types' (1988: 40). Diagnosis then becomes 'a kind of perception and the reasons justifying the diagnosis rest[s] on appeals to analogy' (Jonsen and Toulmin 1988: 40), which in cases of ambiguity means that the physician must choose between diagnoses by deciding how analogous the case is to other similar cases. Importantly, this method of thinking may in the marginal or ambiguous cases lead to different conclusions between clinicians, who 'equally skilled and conscientious may share their information fully and have the best wills in the world' (1988: 40). Again, reaching different diagnoses and treatment proposals does not mean that their judgements are 'subjective or uncheckable' (Jonsen and Toulmin 1988: 41). Rather, time will show 'the consequences of the rival views […] making it clear just how "objectively" serious the different implications of those judgments really were' (1988: 41). By describing clinical rationality in these terms, Jonsen and Toulmin sum up important characteristics of practical reasoning, where conclusions should be understood as 'rebuttable presumptions'[4] that are open for revision; where evidence is 'substantive' rather than formally entailed; and where the inference from evidence to conclusion is 'thoroughly circumstantial', that is, dependent on time and context (Jonsen and Toulmin 1988: 42).

Jonsen and Toulmin use the medical example to illustrate how to approach ambiguous cases in ethics. Their main argument is that 'if we start by considering similarities and differences between particular *types* of cases on a practical level, we open up an alternative approach to ethical theory that is wholly consistent with our moral practice' (1988: 13). Such an approach is neither a question of blindly following principles, nor is it a simple matter of taste or, put differently, it is not a choice between rules or not rules, but between '*good* casuistry, which applies general rules to particular cases with discernment, and bad casuistry, which does the same thing sloppily' (1988: 16). Importantly, especially for the theme of this book, this also goes for cases of failure or misuse of discretion where what is called for is 'not multiplication of further rules the inflexible application of which will only end by creating still more hard cases' (Jonsen and Toulmin 1988: 9).

> When discretion is abused, the first step is not to eliminate the occasion for exercising discretion and impose rigid rules instead: rather, it is more appropriate to ask how matters might be adjusted, so that discretion can be exercised more equitably and discriminatingly. (1988: 341)

In this way, Jonsen and Toulmin also argue for the adjustment of already existing rules and 'the exercise of wisdom, discretion, and discernment in enforcing the rules we already have' (1988: 9) as an 'intelligent alternative', in Dewey's words, between throwing away rules and sticking to them stubbornly (1922: 239–240).

Apart from the obvious fact that pragmatism and casuistry are both recognizably in debt to Aristotle, the many affinities between these two practical attitudes are not widely realized. However, Dewey argues against the common critique of the casuists, and states that 'those who attempt to provide the machinery which render it practically workable deserve praise rather than blame' (Dewey 1908: 298). He repeats this message in *Human Nature and Conduct* (1922), where he describes casuistry as a method that 'ought to be lauded for sincerity and helpfulness, not dispraised as it usual is' (Dewey 1922: 240). In this way, Dewey acknowledges the advantages of the casuistic method, which he defines in close alignment with pragmatism's concept of abduction as 'simply the systematic effort to secure for particular instances of conduct the advantage of general rules which are asserted and believed in' (Dewey 1922: 240).

The close affinity between the two positions is also attested to by Stephen Toulmin, who characterizes himself as a pragmatist and describes John Dewey as 'a man I immensely admire' (Toulmin 1993: 292). In Toulmin's introduction to Dewey's *The Quest for Certainty* (Toulmin 1984; Dewey 1929), he includes Dewey in a line of practical philosophical positions ranging from Aristotle to Cicero, Aquinas, medieval casuists and Adam Smith. Dewey's 'emphasis on the presence of experiential elements in our methods of argument took one step further the debate about practical reasoning which had been initiated in Aristotle's *Topics* and developed by rhetoricians of late antiquity and the Renaissance' (Toulmin 1984: x). Toulmin finds Dewey's identification of logic as experiential and knowledge as rooted in action of particular interest, and he

stresses that in moving away from viewing objectivity as detached to stressing how we interact with what we study—which is called, with an increasingly popular phrase, performativity—Dewey is ahead of his time (Toulmin 1984).

The tension that Toulmin here identifies between a view on knowledge as 'detached objectivity' and a practical and pragmatic view on knowledge as something that is inseparably connected to acting in concrete situations is the tension this chapter has intended to capture. It is the tension between, on the one side, the patient safety programme's understanding of medical knowledge as a simple, generalizable and linear process of treating patients in accordance with assembled evidence and of safety management as error prevention caused by easily identified root causes that can be 'treated' with standards and safety technologies and, on the other side, the particular interpretative, practical and situation-based ways of reasoning and acting in clinical situations that Marianne Paget—a sociologist who has written extensively on medical mistakes—describes with the following words:

> In clinical medicine, knowledge is embedded in a particular activity, the care and treatment of the sick. It is not a form of knowledge but a method of acting and thinking about illness. In use, knowledge takes characteristic shape as acts that are experiments with knowledge—trials, as it were. (Paget 1988: 49)

And when knowledge is trials, error is always a possibility. Thus, the failsafe is not attainable.

In order to understand patient safety, and some of the problems of its ideal of failsafe organizing, an important first step is to gain an understating of the tension identified in this chapter between the safety programme's concept of knowledge as 'scientific', general, systemic, readily implementable and stable and a more practical and pragmatic stance where knowledge practices are understood as a complex combination of stabilized knowledge, earlier experiences, contextual facts of the actual situation and the patient's personal illness story. Identifying this tension is also important in understanding the unwanted consequences of a more 'detached', scientific and systemic view on safety for the attention given

to the safety dispositions and practical types of reasoning needed to keep healthcare practices safe in concrete clinical situations.

Notes

1. Directly translated, the Danish *utilsigtede hændelser* is 'unintended incidents'. While the English 'adverse events' most often refers to harmful outcomes of medical treatment not related to the patients' illness (e.g., Kohn et al. 2000), the Danish translation *utilsigtet hændelse* is used to equally determine those unsafe situations which can potentially lead to injury and those that actually do. In this way, the Danish notion is more equivalent to the internationally used term 'critical incident', which is the background for my preferred use of this term throughout the book.
2. Dewey's discussion of the case of two sick children is a comment to John Stuart Mill (1806–1873), who uses this particular example to account for his principle of induction.
3. Casuistry as a method for solving moral disputes was tarnished especially after Blaise Pascal's highly influential Lettres provinciales (Provincial letters), dated 1656–1657, where he attacks casuistry and accuses the Jesuit casuists of moral sloppiness and laxity.
4. A rebuttable presumption (*praesumptio iuris tantum*) is a term used in law. It can be defined as 'a presumption that the law allows to be contradicted by evidence' (*Oxford English Dictionary*), and, as such, it is a presumption taken as true unless contested or proven otherwise. The term has obvious affinities to pragmatic thought, not least to Dewey's 'warranted assertability' as a preferred term for truth.

References

Aristotle. (2000). *Nicomachean ethics* (R. Crisp, Ed.). Port Chester, NY: Cambridge University Press.

Arras, J. (1991). Getting down to cases: The revival of casuistry in bioethics. *The Journal of Medicine and Philosophy, 16*, 29–51.

Department of Health. (2000). *An organisation with a memory: Expert group report*. London: Department of Health.

Department of Health. (2001). *Building a safer NHS for patients: Implementing an organization with a memory*. London: Department of Health.
Dewey, J. (1908/1978). Ethics. In J. A. Boydston (Ed.), *The middle works of John Dewey, 1899–1924* (Vol. 5). Carbondale: Southern Illinois University Press.
Dewey, J. (1916/1966). *Democracy and education: An introduction to the philosophy of education* (1st paperback ed.). New York: The Free Press.
Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York: Promentheus Books.
Dewey, J. (1929/1984). The quest for certainty. In J. A. Boydston (Ed.), *The later works of John Dewey, 1925–1953* (Vol. 4). Carbondale: Southern Illinois University Press.
Dewey, J. (1938). *Logic: The theory of inquiry*. New York: Henry Holt & Co.
Du Gay, P. (2008). Without affection or enthusiasm' problems of involvement and attachment in 'responsive' public management. *Organization, 15*(3), 335–353.
Foucault, M. (1994). *The birth of the clinic: An archaeology of medical perception*. French edn 1963, English edn 1973. New York: Vintage Books.
Fox, R. (1957). Training for uncertainty. In R. K. Merton, G. Reader, & P. L. Kendall (Eds.), *The student-physician: Introductory studies in the sociology of medical education* (pp. 207–241). Cambridge, MA: Harvard University Press.
Gorovitz, S., & MacIntyre, A. (1976). Toward a theory of medical fallibility. *Journal of Medicine and Philosophy, 1*(1), 51–53.
Grol, R., Berwick, D., & Wensing, M. (2008). On the trail of quality and safety in healthcare. *British Medical Journal, 336*, 74–76.
Hollnagel, E., Wears, R., & Braithwaite, J. (2015). *From Safety-I to Safety-II: A white paper*. The Resilient Health Care Net, Published by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia.
Institute for Healthcare Improvement. (2017). *The next wave of patient safety*. Podcast featuring Derek Freeley and Donald Berwick. January 26. Retrieved from http://www.ihi.org/resources/Pages/AudioandVideo/WIHI_NextWave_of_Patient_Safety.aspx
Jaeger, W. (1957). Aristotle's use of medicine as model of method in his ethics. *The Journal of Hellenic Studies, 77*(1), 54–61.
Jensen, C. B. (2008). Sociology, systems and (patient) safety: Knowledge translation in healthcare policy. *Sociology of Health & Illness, 30*(2), 309–324.
Jensen, E. B. (2004). *Root cause analysis: Compendium for use by patient safety officers and others responsible for conducting root cause analysis of adverse events*. Copenhagen: Dansk Selskab for Patientsikkerhed.

Joint Commission. (2013). Root cause analysis and action plan framework template. March 22. Retrieved from https://www.jointcommission.org/framework_for_conducting_a_root_cause_analysis_and_action_plan/

Jonsen, A. R. (1996). Morally appreciated circumstances: A theoretical problem for casuistry. In W. Sumner & J. Boyle (Eds.), *Philosophical perspectives on bioethics* (pp. 37–49). Toronto: University of Toronto Press.

Jonsen, A. R., & Toulmin, S. (1988). *The abuse of casuistry: A history of moral reasoning*. Berkeley: University of California Press.

Khushf, G. (2004). *Handbook of bioethics: Taking stock of the field from a philosophical perspective*. Hingham, MA: Kluwer Academic Publishers.

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To err is human: Building a safer health system*. Committee on Quality of Healthcare in America, Institute of Medicine. Washington, DC: National Academy Press.

Landrigan, C. P., Parry, G. J., Bones, C. B., et al. (2010). Temporal trends in rates of patient harm resulting from medical care. *The New England Journal of Medicine, 363*(22), 2124–2134.

Leape, L. L. (1994). Error in medicine. *JAMA: The Journal of the American Medical Association, 272*(23), 1851–1857.

Leape, L. L. (1997). A systems analysis approach to medical error. *Journal of Evaluation in Clinical Practice, 3*(3), 213–222.

Mesman, J. (2008). *Uncertainty and medical innovation: Experienced pioneers in neonatal care*. Basingstoke, UK: Palgrave Macmillan.

Montgomery, K. (2005). *How doctors think: Clinical judgment and the practice of medicine*. Cary, NC: Oxford University Press.

Montgomery, K. (2009). Thinking about thinking: Implications for patient safety. *Healthcare Quarterly (Toronto, Ont.)*, 12 Spec No Patient.

Murphy, J., Allstetter, P., Dropp, K., Taylor, L., & Heath, C. (2009). The root cause analysis (RCA) process, one step at a time. *Topic in Patient Safety, 9*(3), 1–3.

NHS. (2008). Root Cause Analysis Investigation Tools: Guide to investigation report writing following Root Cause Analysis of patient safety incidents. National Patient Safety Agency.

Pagan, NO (2008). Configuring the moral self: Aristotle and Dewey. *Foundations of Science, 13*, 239–250. The Netherlands: Springer Science & Business Media B.V.

Paget, M. (1988). *The unity of mistake: A phenomenological interpretation of medical work*. Philadelphia: Temple University Press.

Reason, J. (1990). *Human error*. Cambridge: Cambridge University Press.

Reason, J. (1997). *Managing the risks of organizational accidents*. London: Ashgate Publishing Ltd.

Reason, J. (2000). Human error: Models and management. *BMJ, 320*, 768–770.

Reason, J., Carthey, J., & de Leval, M. R. (2001). Diagnosing "vulnerable system syndrome": An essential prerequisite to effective risk management. *Quality in Health Care, 10*(2), 21–25.

Reason, J., Hollnagel, E., & Paries, J. (2006). *Revisiting the Swiss Cheese Model of accidents*. Project Safbuild. EEC Note No. 13/06. Eurocontrol: European Organisation for the Safety of Air Navigation.

Toulmin, S. (1984). Introduction to the quest for certainty. In J. A. Boydston (Ed.), *The later works of John Dewey 1925–1953: Vol. 4: 1929: The quest for certainty* (pp. vii–xxii). Carbondale: Southern Illinois University Press.

Toulmin, S. (1993). Literary theory, philosophy of science, and persuasive discourse: Thoughts from a neo-premodernist. Interview by Olson GA. *JAC, 13*(2): 283–309.

Waring, J. (2009). Constructing and re-constructing narratives of patient safety. *Social Science & Medicine, 69*(9), 1722–1731.

Waring, J., Allen, D., Braithwaite, J., & Sandall, J. (2016). Healthcare quality and safety: A review of policy, practice and research. *Sociology of Health and Illness, 38*, 198–215.

WHO. (2005). *World alliance for patient safety: Draft guidelines for adverse event reporting and learning systems. From information to action*. Geneva, Switzerland: World Health Organization.

Woodward, H., Lemer, C., & Wu, A. (2009). An end to the witch hunts: Responding to the defenders of blame and shame: A commentary on Collins, Block, Arnold and Christakis. *Social Science and Medicine, 69*(9), 1291–1293.

Wu, A. (2000). Medical error: The second victim. *British Medical Journal, 320*, 726–727.

Part II

4

Blame and Responsibility in Patient Safety

Not long ago, literature on errors and safety culture in medicine was published under headings such as *The Unity of Mistakes* (Paget 1988), *Training for Uncertainty* (Fox 1957), *The Incompetent Doctor* (Rosenthal 1995) and *Forgive and Remember* (Bosk 2003 [1979]). Such titles are not common today, and within present modes of patient safety they would be almost inconceivable. Instead, *mistakes* are replaced by 'adverse events' or 'critical incidents'; *uncertainty* by a strong faith in the possibility of creating failsafe environments; *incompetence* by a focus on systemic failure; and *forgiveness* and *remembrance* by 'systems learning' and 'blame-free' perspectives.

In an effort to investigate the myth of the so-called old ways of 'naming, blaming, and shaming' (Reason 2000: 768) on which the systemic perspective on safety is founded, this chapter revisits accounts of medical practice, safety cultures and medical error formulated before the inception of the present patient safety agenda. What we find here is not one-sided images of 'blame cultures' but rather sophisticated descriptions of a collegial and informal ecology of safety and error management based on an awareness of the inherently fallible nature of medical work. In particular, descriptions of the delicate and often local and rather informal structures of monitoring, classifying and managing different sorts of errors in

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7_4

the professional community seriously challenge the dominant dichotomy between individual responsibility and blame on the one hand and a blame-free systemic perspective on medical error on the other. In this way, the turn to earlier sociological accounts of medical error casts new light on recent patient safety policies and practices.[1]

Naming, Blaming and Shaming: Myths about Medical Culture

'We need to move from a culture of shame-and-blame—where a hunt is conducted for the offender, someone is fired, and we wind up repeating our mistakes—to a blame-free mindset' (Woodward et al. 2009: 1291). This is the typical structure of the repeated argument that the present modes of patient safety rests upon. The argument is built on certain assumptions about human reactions to error; namely, as it is put in *To Err Is Human*, '[t]he common initial reaction when an error occurs is to find and blame someone' (Kohn et al. 2000: 49).

The argumentative structure of the 'from blame culture to systems perspective' argument draws heavily on safety science, human factors studies and cognitive psychology, especially on professor of psychology James Reason's work on human errors (1990, 2000). By drawing a sharp line between a so-called person approach and a system approach, Reason argues for the existence of two radically different ways of understanding human error in organizations:

> The human error problem can be viewed in two ways: the person approach and the system approach. Each has its model of error causation and each model gives rise to quite different philosophies of error management. Understanding these differences has important practical implications for coping with the ever-present risk of mishaps in clinical practice. (2000: 768)

Reason suggests that followers of the person approach, where the individual worker is in focus, 'tend to treat errors as moral issues, assuming that bad things happen to bad people' (2000: 768). Risk management methods here include 'disciplinary measures, threat of litigation, retraining,

naming, blaming, and shaming' (Reason 2000: 768). The system approach, on the other hand, can be described as follows:

> The basic premise in the system approach is that humans are fallible and errors are to be expected, even in the best organisations. Errors are seen as consequences rather than causes, having their origins not so much in the perversity of human nature as in 'upstream' systemic factors. (Reason 2000: 768)

This argument establishes an understanding of errors as systemic, i.e., that errors stem from the organizational set-up, or the system, instead of individual incompetence or intentional wrongdoing. Errors might well be caused by human factors such as inattentiveness, stress, cognitive slips and so on (and they most often are from this perspective), but they are most effectively dealt with by reorganizing the system so the likelihood of such errors are reduced, rather than blaming individuals or trying to affect 'human nature' by, for instance, education and retraining.

What is evident in Reasons' text, as in much patient safety literature, is that the 'person approach', which is described as 'a longstanding and widespread tradition' (Reason 2000: 768), is automatically ascribed to medical practice as the dominant way of reacting to medical error. As Reason puts it, '[t]he person approach remains the dominant tradition in medicine, as elsewhere' (Reason 2000: 768). As such, it is on the assumption that 'we have failed to design our systems for safety, relying instead on requiring individual error-free performance enforced by punishment' (Leape et al. 1998: 1444) that paves the way for a system approach to patient safety. More specifically, it is argued that 'blame cultures' should be replaced by what is most often referred to as 'safety culture' and 'learning culture' but also as 'blame-free culture' or 'just culture' founded on blame-free reporting and critical incidents analysis.

Reason's division between two apparently opposite modes of patient safety—'the person approach' and 'the system approach'—has had an enormous influence on the field and is still quoted in main patient safety documents. In WHO's comprehensive and widely used Multi-professional Patient Safety Curriculum Guide (2011), for example, the traditional way of handling error is described with a reference to Reason under the headline 'History of patient safety and the origins of the blame culture':

> The way we have traditionally managed failures and mistakes in health care has been called the person approach—we single out the individuals directly involved in the patient care at the time of the incident and hold them accountable. This act of 'blaming' in health care has been a common way for resolving health-care problems. We refer to this as the 'blame culture'. (WHO 2011: 85)

And more than a decade after the introduction of the patient safety programme, the 'blame culture' is still said to constrain the health system's ability to manage risk and introduce systemic solutions: 'Systemic improvements cannot be made as long as we focus on blaming individuals' (WHO 2011: 100).

The following widely cited quote from *To Err Is Human* lays bare the peculiar logic of the oft-repeated argument of the need to go from a blame culture to a safety culture:

> [H]ealth care organizations must develop a systems orientation to patient safety, rather than an orientation that finds and attaches blame to individuals. It would be hard to overestimate the underlying, critical importance of developing such a culture of safety to any efforts that are made to reduce error. The most important barrier to improving patient safety is lack of awareness of the extent to which errors occur daily in all health care settings and organizations. This lack of awareness exists because the vast majority of errors are not reported, and they are not reported because personnel fear they will be punished. (Kohn et al. 2000: 157)

The dominant line of reasoning in this quote is built on a number of mutually dependent assumptions: First, because of the fear of punishment, healthcare professionals do not report errors. Second, because errors are not reported and, hence, are not visible, healthcare professionals are not aware of the fallible nature of medical work. Third, this lack of awareness of error is a main barrier to improve patient safety. Following this peculiar argumentative structure, then, introducing a systems orientation to safety will diminish the dominant blame culture, which will increase error reporting, which will then increase error awareness and systemic solutions, which will finally increase safety.

One way to test these assumptions is by looking into some of the studies of medical error in the sociological literatures from the 1950s to the mid-1990s conducted before the introduction of the patient safety programme. In the following section, I present four of the most comprehensive and commonly referenced of these studies (Bosk 2003 [1979]; Fox 1957; Paget 1988; Rosenthal 1995). These are studies conducted at different times, in different healthcare contexts, with the use of different methodologies. Moreover, they study dissimilar medical specialities and have somewhat divergent study objects and aims. While the first two studies address the fallible nature of medical knowledge and discuss the ethical dilemmas clinicians face in practice and focus on how they must learn to live and act with mistakes and uncertainty (Fox 1957; Paget 1988), the latter two focus on medical culture and especially on the regulation of medical error by internal self-control mechanisms within the medical community (Bosk 2003 [1979]; Rosenthal 1995). Hence, the four studies are dissimilar in many respects, but as I show in this chapter, the set of assumptions and the constellation of concerns over which they are hovering are quite similar. Although I dwell swiftly on some of their variations, the chapter primarily attends to the analytical and empirical similarities between the studies.

A Culture of Doubting: Fox on Acting with Uncertainty

In 1957, the prominent medical sociologist Renée Fox wrote what has been determined as 'a landmark article' (Timmermans and Angell 2001) with the title 'Training for Uncertainty' built on interviews with student physicians. The paper set the stage for a career in medical sociology where her work can be interpreted as a series of variations of the theme of uncertainty. At the time Fox wrote the paper, she was in the midst of her dissertation research based on a comprehensive hospital study, which was published in 1959 as *Experiment Perilous: Physicians and Patients Facing the Unknown*. Here she studied the physicians working with metabolic disorders as 'specialists in problems of uncertainty' (1959: 28) because of the limitations in medical knowledge within this field and hence the large

amount of experimentation involved in the work. In later studies, she also specifically addresses the theme of uncertainty (e.g., Fox 1980, 2000), and emphasizes the often experimental, unpredictable or sometimes even hazardous nature of medical work and knowledge (e.g., Fox and Swazey 1974).

'Training for uncertainty' is an interesting early description of the important tensions involved in practising as a physician, not least the tensions related to the links between uncertainty, risk and professional responsibility. Fox stresses that, while becoming a physician is certainly about being educated in medical knowledge, it is just as much an education in 'the uncertainties of medicine and how to cope with them' (Fox 1957: 207). While the paper is not directly about medical errors and safety culture, it nevertheless illustrates how uncertainty and coping with the possibility of failure is a significant and intrinsic part of being a clinician. According to Fox, this uncertainty takes different forms: It can be due to limitations in medical knowledge, due to personal ignorance or ineptitude, or it can be due to the fact that it is difficult to distinguish between these two first types of uncertainty (Fox 1957: 208). Fox argues: 'It is inevitable that every doctor must constantly cope with these forms of uncertainty and that grave consequences may result if he is not able to do so' (1957: 208). Accordingly, the physicians develop a particular attitude that makes coping possible; they develop an 'experimental point of view' where medicine is approached as 'something less than a powerful, exact science, based on nicely invariant principles' (1957: 214). Thus, with reference to a so-called philosophy of doubting (Fox 1957: 220), Fox describes a medical culture (and a medical educational system) which is able to deal with doubts and uncertainties in a 'forthright manner', and where physicians in their student years are expected, or even morally obliged, 'to be uncertain about what he knows and candid about his uncertainty' (Fox 1957: 221). During the years of medical training, the students will slowly develop this attitude: First, their distrust in their own abilities will slowly decrease as they attain more experience and better mastery of the techniques of medicine. Second, they will gradually come to terms with the inherent fallibility of medical knowledge and start to acquire a more 'affirmative attitude' (Fox 1957: 219) towards doubting; they will learn to tolerate and not least to act with uncertainty.

> [I]f he is to meet his clinical responsibilities, he cannot allow himself to doubt as openly or to the same extent that he did during his preclinical years. Instead, he must commit himself to some of the tentative judgments he makes and move decisively on behalf of his patients. (Fox 1957: 227)

In this way, the initial doubt is supplemented or even replaced by the necessity of adopting a manner of certitude to be able to '"act like a savant" even when he does not actually feel sure' (Fox 1957: 227).

What Fox's description here suggests is that the training of physicians involve more than the mastery of the medical sciences. It also involves the gradual development or inculcation of a set of personal attitudes or a particular way of relating to and governing the self of the physician. To learn to face up to the fact that one's actions can cause the death or disability of patients is not an easy thing, and it cannot be taught as part of medical theory. Rather, it must be practised through everyday clinical work and decision-making, which as a condition of their particular office will slowly transform the persona of the physician. In steeling themselves for failure, the trainees acquire the fortitude and 'psychological momentum' to act with certainty.

The need to impose some kind of temporary certainty in order to act is established through a particular idea of and faith in clinical perception. Not unlike the Foucauldian notion of the medical gaze from his *The Birth of The Clinic* (1994/1963), Fox describes how the student physician is 'being asked to glean whatever information he can from the processes of looking, feeling, and listening' (1957: 214) in an almost mythical way. The student physician is being taught that becoming a doctor is about learning a particular way of perceiving:

> For, the ability to 'see what you ought to see'; 'feel what you ought to feel', and 'hear what you ought to hear', students assure us, is premised upon 'a knowledge of what you're supposed to observe', an ordered method for making these observations, and a great deal of practice in medical ways of perceiving. (Fox 1957: 214)

And, Fox continues, 'in all of these situations, students are often expected to see before they know how to look or what to look for' (Fox 1957: 214). The idea that medical perceptiveness and reasoning are

somehow gifts of the clinician rather than something that is gradually trained and learned easily leads to self-blaming and questioning by the student when a sign is missed (1957: 215). It is therefore vital, Fox stresses, to recognize that becoming a physician is about training a particular attitude; and this is best done through apprenticeship. It is through 'direct contact with instructors' and by 'listening to experienced doctors reason out loud' (1957: 227) that a physician learns, not about medical knowledge, but 'how a doctor organizes and uses his information' (1957: 227); that is, learning the art of practical reasoning, clinical judgement and, not least, how to act in the face of uncertainty.

There is no doubt that Fox writes with what Cassell identifies as an optimism of the 1950s (2002: 245), and although Fox in her early paper describes how the student physician learns to cope with uncertainty by acting with relative certainty, the paper and her later work has been accused of putting too much emphasis on uncertainty and experimentation and too little on the importance of 'certainty' in medical training and practice. In Atkinson's paper 'Training for certainty' (1984), this critique is presented not so much based on Fox's actual arguments, but rather on the reception of Fox and the way the image of the medical ethos as one that acknowledges, copes and acts with uncertainty has become a taken-for-grated wisdom of medical sociology (Atkinson 1984: 951). This is interesting when compared with common patient safety literature where medical culture is said to be dominated by too much 'certainty'. But where the patient safety literature often depicts the problem of certainty as a result of a lack of knowledge of uncertainty and error caused by a fear of punishment and an accompanying reluctance to disclose errors, Atkinson's notion of 'training for certainty' is rather a description of how students adopt a 'think as usual' approach to medical work. With a reference to the phenomenologist Alfred Schutz's (1899–1959) notion of a 'natural attitude', Atkinson draws attention to all the instances in which the physician must 'think as usual' through 'a stock of typifications, recipes for action and so on which are drawn on in an essentially practical fashion' (1984: 955). In so far as students experience problems using this type of incomplete reasoning—and they necessarily do—this does not lead to plagues of radical uncertainty and doubt but rather to a revised understanding of the partial and situated nature of medical knowledge.

> Personal knowledge and experience are not treated as reflections of uncertainty but as warrants for *certainty*. The primacy of direct experience is taken to guarantee knowledge which the student and practitioner can rely on. The distinction between 'theory' and 'practice' or between 'science' and 'experience' is not drawn in order to contrast 'certainty' and 'uncertainty'. Both are ways of warranting knowledge for practitioners' practical purposes. (Atkinson 1984: 953)

So when physicians are able to act with relative certainty by reference to routine and experience, it is, according to Atkinson, not because they lack knowledge of errors and uncertainty, but rather because they accept the practical nature of their enterprise and define certainty as temporary and located in accordance with this. With Dewey's preferred word for truth, they understand any medical fact as a warranted assertability. Thus, Fox and Atkinson agree about the need for physicians to act with certainty. But where Atkinson attends to what is taken for granted as a condition of ordinary action, and argues that, with a phenomenological term, the students overcome the fear of failure by adopting the natural attitude, Fox argues that students need to internalize the fact that they are fallible and will fail. They must learn to live with the fact that they will eventually hurt patients also when they do everything in their power not to. It is only by steeling themselves to this knowledge that they will acquire a capacity to act resolutely and with a kind of certainty that is based on this uncertainty. Knowing as a surgeon, for instance, that you have to cut someone open and inevitably harm them in order to (maybe) help them is something quite extraordinary (and hence not 'natural') that only a select few people have to incorporate in their sense and practice of 'self'.

Competent Decisions Going Wrong: Paget on Medical Mistakes

The necessity of acting with certainty, even in the midst of uncertainty, is further investigated in sociologist Marianne Paget's *The Unity of Mistakes: A Phenomenological Interpretation of Medical Work* (1988): a study based on in-depth interviews with 40 physicians in medical training and practice.

Within patient safety circles, Paget is well known mostly because of her personal story: While studying medical errors she was to become a victim of her very research subject as her chronic back pain turned out to be a misdiagnosed and rare cancer from which she later died. Her study, however, is interesting for other reasons, not least for its detailed analysis of the nature of medical mistakes and of the subtle and constitutive relation between the mistake and the clinician. When Paget uses the term 'mistake' to label her main study object, it is not a coincidence. Having attained its terminological meaning from sayings such as 'to take wrongly' or 'to take a wrong turn or path', the word 'mistake' denotes an act that goes wrong. As Paget puts it, '"[m]istake" is one of the few terms we have that expresses our recognition that something we initiated went wrong' (1988: 11). Paget's focus on the mistake gives rise to some important insights. First, a mistake is always contingent and dynamic, as it is intrinsically and by definition connected to time as it unfolds. She explains: 'A mistake follows an act and identifies the character of an act in its completion. It identifies its incorrectness or wrongness. An act, on the other hand, is not wrong; it becomes wrong or goes wrong' (Paget 1988: 7). In this way, the mistake is a reflection of an action or activity after the fact. Second, by choosing the notion of 'mistake' that indicates the temporal character of medical error, Paget is interested in studying the moral tensions related to the personal involvement in 'something that happened wrong with respect to another person's life' (1988: 12).

In this way, she attends to the moral dimensions of acting in 'good faith' but with the constant possibility of later realizing that you were wrong and that being wrong in clinical practice might have catastrophic consequences for other people's lives. Paget determines this moral dimension of the uncertainty of medical work as 'a complex sorrow' (Paget 1988: 7). The timely aspect of the mistake, and the moral tension that follows from it, indicates that discussions about intentions, fault, blame, incompetence and negligence might not be straightforward matters in medical practice. Making a mistake from this perspective, or 'an action-becoming-wrong', is not necessarily, not even often, a question of incompetence, as you might well make competent decisions but still be mistaken. It is also not 'a systemic' error resulting from the interaction of systemic components or human factors such as

inattentiveness. Instead, the instances Paget addresses specifically concern the 'best possible' deliberate acts and individual or collective clinical decisions made on the basis of the information available at a particular point in time.

With this notion of a mistake as neither a clear case of 'blame-free systemic' error or of incompetence (or from a legal perspective, negligence), Paget touches upon what seems to be a blind spot for present modes of patient safety. And not just any blind spot. The possibility of mistakes (or 'acts going wrong') is, according to Paget, defining for medical practice in general and for the ethos of the medical practitioner in particular. Paget argues that clinical work understood as 'the process of acquiring, interpreting, managing, and reporting the disorders of human illness' (Paget 1988: 34) is inevitably an error-ridden activity. What she defines as 'the essential developmental nature of clinical work' (Paget 1988: 27) makes medical knowledge and practice intrinsically uncertain, experimental and therefore also prone to error. In this characterization of medical work as error-ridden, Paget draws on Goroviz and MacIntyre's 'Toward a Theory of Medical Fallibility' (1976) where they define medicine as a science of the particular (see Paget 1988: 25–27). Goroviz and MacIntyre point out that as 'an enterprise that is concerned essentially with the flourishing of particulars, of individuals' (1976: 64), medicine has an intrinsically problematic relationship with probability.[2] Working with particulars, with patients, means that every intervention is necessarily 'an experiment in regard to the well-being of that individual patient' (1976: 64). This experimental character of medical work does not only make errors a necessary possibility; it causes a 'necessary fallibility of the individual physician' (1976: 64).

Parting from this characterization, Paget poses her main problem: namely, 'given the inevitability of mistakes, what is medical work like and what is it like to be a person who does this kind of work?' (Paget 1988: 17). She finds that the medical practitioner is necessarily a person who must learn to 'act as if'—a notion by which she captures, like Fox before her, the dilemma of having to act with certainty in the mist of the uncertainty of the application of medical knowledge on individual patients. Because probabilities are not always able to predict the specific instances, one can only always just act and hope for the best: 'The only way it

[medical knowledge] can be tested is in acting it out, acting as if it were accurate or plausible or revealing' (Paget 1988: 52). When 'acting as if' one risks making mistakes, and from this follows what Fox with phenomenological inspiration describes as the 'too-lateness of human understanding' (1988: 149): We are always at risk of knowing too late that we took what turned out to be a wrong turn. In spite of Paget's more philosophical aspirations, her general argument is not far from Fox's: She describes an ethos that needs to accept the possibility of making mistakes as well as to learn how to live with this uncertainty and still be able to act. Thus, accepting this uncertainty forms part of a piece of ethical or psychological work that physicians have to perform on themselves.

In seeming accordance with the present safety agenda fight against blame, Paget argues with regret that our language to speak about mistakes and errors carries 'a patina of blame' (1988: 140). But here the similarities stop, because where the safety programme uses this argument to insist that we should change our focus from the individual health professional to health systems, Paget's most important insight is that we must understand that '[t]he inner logic of mistakes, in any case, lies not in blame but in time as it unfolds in action, in the press of circumstances and the immediacy of the task and the knowledge at hand' (1988: 140); and that, as such, the medical mistake often causes regret and sorrow for the physician(s) who took the wrong turn, without this being a cause for blame.

Of course mistakes do not always lead back to an individual, they can be more systemic, or the result of group action. But in its personal form, a mistake means that someone is at fault. When at fault, a clinician did something wrong: He or she took what is now known to be the wrong path. And in this way, Paget argues, being at fault does imply personal misconduct. But in the exact same way as a mistake is an action gone wrong, misconduct is conduct gone wrong. That is, it is conduct judged to be wrong at a later time. And this does imply a moral disapprobation, not because it necessarily must be 'blamed' but because misconduct requires correction of conduct in terms of learning and experience: 'If I knew then what I know now I would not have done x. I will not do it again' (1988: 131). As I show in Chaps. 6 and 9 of this book, this support for disapprobation as a learning device is in

line with John Dewey's understanding of the importance of approving or disapproving actions.

While Paget delivers detailed descriptions of the mistake and the fallibility of the medical ethos, she is less clear about the organizational processes by which misconduct can be determined and she only shortly addresses how medicine can be organized in ways that can take into account the error-ridden character of medical work. Paget here especially focuses on what she determines as 'medical talk': the formal and informal discussions about patients, their illnesses and their treatment. In these talks, medical problems, difficult issues and doubts are exchanged, and the medical practitioners are exposed; the weaknesses and strengths of their thoughts and arguments are reviled. Without much specification and differentiation between the function and place of these talks, Paget insists that such 'medical talk' is and has to be 'neutral' and non-judgemental. Paget refers to this as an 'attitude of inquiry rather than judgment' (Paget 1988: 138): an attitude that entails a continuous reflection on medical experiences with the intention of, for instance, identifying limits to particular methodologies and techniques rather than identifying errors as such—and with the intention of learning from this experience, not passing blame. Moreover, she argues, medical talk often releases inner tensions:

> The inner experience of regret, remorse, and anxiety or of anger and anguish is often taken up in a collective re-examination of a failure of the work and absorbed by the collective. In this way, both a release and an integration can be achieved (attempted). (Paget 1988: 159)

Paget's account teaches us about the temporal and moral ambiguities of the mistake, the fallible nature of medical work, the 'complex sorrow' accompanying the necessity of 'acting as if', and the constitutive relationship between medical error, medical work and the ethos of the clinician. But it does not address the organizational mechanisms for determining and differentiating between different types of mistakes and misconduct and it only hints somewhat generically to some of the internal mechanisms for coping with error in terms of the important function of medical conferences and informal talks, for instance. In the next pages,

I present two sociological studies that address the internal control mechanisms for monitoring, defining, managing and learning from errors and misconduct within the professional community.

Technical and Normative Errors: Bosk on Professional Self-control

In 1979, Charles Bosk published a sociological study titled *Forgive and Remember: Managing Medical Failure* (Bosk 2003, 2nd edition), based on 18 months of fieldwork in a US elite hospital. By focusing on the training of resident surgeons, Bosk set out to investigate occupational morality, social control mechanisms and reactions to medical errors. The most important and original insight following from the study is based on the observation that whether a resident's error was forgiven by the attending surgeons or whether it had sanctionary consequences of some sort could generally be determined by the character of the error in question. On the basis of this observation, Bosk divides error into a tentative distinction between what he determines as technical error, judgemental error, normative error and quasi-normative error, where the first two describe errors of medical technique or judgement, that is, for instance, failure of applying medical knowledge correctly. Of the second two categories, the normative error is to be understood as failure to follow professional codes of conduct, while the quasi-normative error is more specifically failure to follow the advice of a particular attending. A typical normative error concerns the 'violation of the principle of full and honest disclosure' (Bosk 2003: 53), but also the inability to get along with nurses and the lack of cooperation with patients and their families are often understood as a normative error. Thus, normative errors are errors that result from lack of will rather than lack of skill.

The study shows that while those errors that were understood as technical within the clinic were occasions for support, forgiveness and restitutive sanctions (if they did not occur repeatedly), normative errors were censored much harder, through repressive sanctions and often through banishment from the medical elite at the hospital, although the surgeons

that refused to follow the codes of conduct were often still able to become surgeons elsewhere.

With an outsider's view it might seem puzzling, Bosk argues, that morality precedes technique in the social control of error in medicine. The answer to this puzzlement is to be found in the internal expectations to the particular obligations, commitment and moral conduct of the medical practitioner. Because as long as you can claim to have done everything you possibly could, failure is forgiven: 'The individual claims his conduct is beyond question—that he did everything any other member of his profession might have done in similar circumstances—and the failure is accidental, incidental, and random' (Bosk 2003: 170). The claim to have 'done everything possible' is a claim to have acted in good faith; it is a claim to ethical conduct. In this way, the technical error is not far from Paget's understanding of the mistake, as an action going wrong. And not unlike Paget's description of the constant processing of mistakes in 'medical talk', Bosk describes how the social control of technical errors is 'built in to the fabric of everyday life as mini-discussions of surgical problems, as anecdotes or horror stories, as hypothetical questions for future consideration, or as mild rebukes' (Bosk 2003: 173). These errors are understood and treated by the medical community as a normal part of medical practice. They happen as a consequence of the uncertainty of medical knowledge and practice, Bosk argues, with various references to the work of René Fox. Moreover, with technical errors it is not always possible to detect a particular cause or a particular person responsible: 'With errors of technique it is never completely clear whether the fault lies in the individual or in the field' (2003: 174). But that technical errors are normal, excusable and often more 'systemic' does not mean that they should be quickly forgotten, because surgeons, Bosk argues, must always strive for both technical and moral superiority. Bosk notices that the disclosure and processing of technical errors institute both responsibility and learning in the person making them. The mere fact that these errors are forgiven by attending surgeons makes future disclosure of error more likely and creates a sense of obligation in residents, which obliges them 'to work harder, to dedicate oneself to patient care, and to improve performance' (2003: 252).

Thus, while the social control of technical error is often inconspicuous and 'built into the every performance of tasks' (2003: 176), the control of normative error stands out and is treated both more loudly and conspicuously. The reason being that with moral error, someone is doing 'less' than everything possible: 'Moral error breaches a professional's contract with his client. He has not acted in good faith. He has done less than he should have' (Bosk 2003: 171). Therefore, a normative error is connected to the persona and character of the surgeon:

> A normative error occurs when a surgeon has, in the eyes of others, failed to discharge his role obligations conscientiously. (…) When a normative error occurs, the mistake renders it impossible to consider the person making it—in legal terms—a just and reasonably prudent individual. (Bosk 2003: 51)

Such deficiencies in moral performance are treated more seriously than in technical performance because moral errors are thought of as unbecoming and blameworthy, and they are frequently connected with a clinicians' incapacity and unwillingness to improve. In sharp contrast to the handling of technical error, moral errors are therefore often treated with intolerance, condemnation and punishment, for instance, through '[p]ublic humiliations and dressing-downs, sarcastic and mock-ironic remarks, or a pointed ignoring of the guilty party' (2003: 177). Such punishment is especially harsh when the practitioner in question shows no desire for self-improvement (2003: 180).

At least two points should be made about Bosk's study when compared to present-day patient safety policy. First, Bosk finds that the majority of medical errors are understood as 'technical' errors that could have happened to anyone in the same situation, and, as such, they are 'accidental, incidental, and random'. In relation to these errors, Bosk does not find a 'naming and blaming culture' but rather an environment that actively encourages and demands disclosure of error. In his study, this is most vividly expressed in the so-called Mortality and Morbidity Conference, a session in which mortality cases are reviewed while an attending physician takes full responsibility for mistakes and shortcomings without naming subordinates. Bosk applies the expression 'to put

on the hair shirt' as a way to describe this ritual where mistakes are excused by being disclosed:

> By allowing actions that cause guilt to be openly confessed, putting on the hair shirt is a form of institutionalized self-protection for attendings. At the same time, it communicates to subordinates that no one is perfect; it models for them the proper expression of guilt and teaches them to accept that such accidents are inevitable, unfortunate, and intractable fact of professional life. (Bosk 2003: 144)

By taking responsibility for mistakes the attending shows his or her subordinates that the standards he or she expects from them apply to him or her as well. Moreover, by being honest and open about shortcomings and mistakes, the attending demonstrates his or her dedication and that his or her 'own integrity and motives are beyond question' (Bosk 2003: 146). In this way, Bosk's description of these sessions serves as an interesting display of the possibility of disclosing errors and accepting these as a normal part of medical practice and at the same time taking individual responsibility for the error and expressing guilt. The crucial thing here is the hierarchical relation between attending physicians and residents, which is a relationship only possible within the institution of the clinical hospital through which both medical expertise and ethical attitudes are transmitted.

Second, when penalizing does take place in clinical practice, it is used in very particular cases where the clinician has failed to live up to his or her responsibilities and 'act in the patient's interest'. These cases then serve as important moral regulatory mechanisms and Bosk identifies residency training 'as a moral education, the purpose of which is to teach young doctors the standards of practice' (Bosk 2003: xvi). If residents are not able to live up to the moral demands, it has consequences within the professional community, and, as such, the 'failure to forgive establishes the normative boundaries for professional behavior' (Bosk 2003: 252).

Instead, then, of an unambiguous 'blame culture' Bosk finds a medical community in which 'forgiveness and punishment are the poles of a continuum on which responses to deviant acts can be arrayed' (Bosk 2003: 180). The mechanisms of professional self-control imbedded in this con-

tinuum are an indispensable part of the character building and moral education of the clinician. In this way, Bosk points to the important regulatory function of professional error management for establishing and setting the boundaries for the professional and moral conduct of clinicians.

Despite these positive effects of professional self-regulation, Bosk's analysis also indicates some of the problems of the internal clinical system for error management and he especially emphasizes that while individual conscience as a control mechanism is highly developed, corporate devices are in general underdeveloped. This has consequences not least for the treatment of incompetence, where the surgeon in question, if laid off, is often able to get rehired at other hospitals. In the 1990s, Marilyn Rosenthal takes up some of these questions as she proceeds to analyse the character of the different co-collegial mechanisms for monitoring, categorizing and responding to error in medical practice. Specifically, she addresses the strengths and the weaknesses of the informal professional structures for managing incompetence and negligence, and she thereby touches more consistently upon one of the more important concerns that is largely ignored by recent safety policy.

A Problem of Incompetence: Rosenthal on Problem Doctors

Marilyn Rosenthal's *The Incompetent Doctor: Behind Closed Doors* (1995) is built on interviews with general practitioners in the UK and Sweden in the 1990s.[3] Starting with the argument that medical autonomy is justified primarily by its self-regulating mechanisms, Rosenthal sets out to investigate how rigorously the medical profession regulates itself and, in particular, how it deals 'with exigencies of someone who is faltering, unable or potentially unable to carry out work in a reasonable manner' (Rosenthal 1995: 7)—that is, with incompetence. In this way, she touches upon some of the social control issues of Bosk's 1970s US study of resident surgeons, but where Bosk very specifically characterizes the differences in the regulation of technical and moral error, Rosenthal is interested

in how the medical community regulates 'problem doctors' defined by 'lack of knowledge and/or skill; various forms of impairment; temporary personal problems or burnout; and personality conflicts' (Rosenthal 1995: 94). These are the doctors who commit more mistakes (moral and/or technical) than what is accepted within the community and who consistently deliver treatment and patient care that can be determined as below standard. In this way, Rosenthal is also interested in the policing of the profession and not only in the way physicians 'police' themselves (ethically or therapeutically).

Rosenthal's study describes a number of informal and quasi-formal methods of responding to incompetence within the professional community. This involves, for instance, quiet chats or 'protective support', where work is silently taken from the doctor as 'an act of friendly collusion' (Rosenthal 1995: 58). Only if these collegial mechanisms fail, more formal management of the situation is attempted: 'When the informal and quasi-formal professional efforts do not produce desired results or break down, managers are brought more directly, if reluctantly, into the case' (Rosenthal 1995: 70).[4] One might think that now is the time for naming and blaming, but according to Rosenthal this is not the case. Rather, discrete internal or external reviews are conducted 'in such a way that the doctor is not overtly under criticism or attack' (Rosenthal 1995: 73), or management will try to negotiate early retirement—described as 'a dignity bribe' (Rosenthal 1995: 78). Suspension is only used in very few cases as a measure against 'problem doctors'—and these are often the (only) cases that become public. In this way, Rosenthal describes a local and internal system of regulating error embedded in clinical practice and based on a sense of professional and social community. As such, errors are defined, classified and dealt with locally, gently and behind closed doors. The closed and internal nature of these processes is not a problem, she argues. Taking the nature of medical work into consideration, it is the most productive way of dealing with problems of incompetence.

There are, however, a number of challenges consequential for the effectiveness of these self-regulating measures. Rosenthal suggests that the idea of professional autonomy poses an inherent dilemma related to the effectiveness of self-regulation. On the one hand, the uncertain nature of

clinical work indicates that the professional himself or herself is indeed in the best position to pass judgement on clinical and professional behaviour. Only the professionals themselves fully understand the 'permanent uncertainty, necessary fallibility, shared personal vulnerability, understanding and forgiveness' (Rosenthal 1995: 27) that is the condition for clinical practice and conduct. On the other hand, a number of mechanisms constrain the capacity of a medical community to pass judgement on its members, in so far as social control mechanisms can be understood as contrary to collegiality norms and support. Arguing not from the perspective of the unequal relationship between attending and residents, as Bosk did, but rather on specialists' ability to check on each other, Rosenthal suggests that '[*t*]he *norms of professional etiquette* and equality among peers make it difficult to pass judgment on a fellow doctor' (1995: 78). Moreover, the specialized character of medical work makes criticism hard to justify. Such challenges can result in delayed or absent action in dealing with incompetence. What is more, the internal and closed processes introduce an element of chance, as the effectiveness of these processes is likely to be dependent on the quality of interpersonal relationships and management skills in the specific situation. Rosenthal concludes that informal processes of co-collegial problem solving, although preferable, are not always enough. She therefore argues for the necessity of more quasi-formal procedures to support the already existing informal processes of social control, especially the creation of a stronger alliance between management and professionals. The best results are obtained when management and healthcare professionals work effectively as a team, that is, when managers 'support and aid efforts of colleagues to deal with these problems themselves, and behind closed doors' (Rosenthal 1995: 103). Thus, Rosenthal suggests that often internal mechanisms are the best answer to the difficult and ambiguous task of maintaining and supporting the professional ecology of error management *and* strengthening the possibilities of reacting to incompetence and negligence. Compared to external control systems, or the introduction of standardized rules and procedures, internal, local and more informal mechanisms are often less costly, more effective and more humane—but, she adds, they require skill (Rosenthal 1995: 107).

Rosenthal's argument about the nature, the strengths and the problems of medical self-regulation offers an interesting comparison to the present safety regime, not least because the internal mechanisms of professional self-regulation described in the study are strikingly far from the pictures painted in present safety policy of a culture of 'naming, blaming and shaming'. Rather, Rosenthal finds that self-regulating mechanisms are based on a strong 'shared vulnerability' amongst healthcare professionals, an understanding based on self-identification and a feeling that 'this could also happen to me', which, together with an appreciation of the inherent fallibility of medical practice, makes understanding and forgiveness easy (Rosenthal 1995: 20–21). This understanding and forgiveness is in many ways a strength in relation to the medical community's self-regulation, but it can also become a problem when it turns into 'a norm of non-criticism' or 'a conspiracy of tolerance' (Rosenthal 1995: 20–21) that leads to either zero action or to measures that are too late or too mild in regard to problem doctors.

Busting the Myth of the 'Person Approach'

In spite of the differences in cases, time, place and problem in the studies of medical error laid out in this chapter, a number of striking similarities in the substance of arguments can be found that contrast current understandings of error, safety and medical practice in patient safety literature and health policy. As portrayed in the beginning of the chapter, notions of the 'person approach' and especially of 'blame culture' as ways to describe medical culture and error management are used as the typical justification for the systems perspective on safety management in present modes of patient safety thinking. The sharp dichotomy between the person approach with its associated 'blame culture' on the one hand and the systemic approach and its learning, safety or blame-free culture on the other has become so important as a justification for the patient safety programme that it is understood as a vital element in medical training: 'It is crucial that students begin their vocation by understanding the difference between blame and systems approaches' (WHO 2011: 30; see Chap. 9).

The accounts of medical practice, medical error and internal self-regulation given in this chapter challenge the dichotomized idea of a 'person' and a 'system' approach of mainstream patient safety literature by contesting the very existence of a 'person approach' and a 'blame culture' in medicine and, at the same time, by questioning how new and radically different 'a systems approach' to medical error is in healthcare practice. Moreover, they contest the fruitfulness and the very possibility of sharply dividing error definition and error management into these two radically different approaches.

To elaborate, none of the previous accounts presented in this chapter describes the immediate reaction to error in medicine as one of blaming individual clinicians. Rather, they describe how the clinician's basic notion of error is quite 'systemic', that is, understood in relation to the complicated interplay between individual and surroundings as well as to the inherent fallibility of medical work and the incompleteness of medical knowledge. As such, errors are most often recognized by the medical profession as 'accidental, incidental, and random' (Bosk 2003: 170). As Rosenthal's work indicates, even the term 'adverse events' was commonly used before the inception of the safety programme:

> When doctors think about mistakes or accidents in their practice, they emphasize the uncertainties, the importance of multiple mitigating circumstances, the existence of known risks; they accept the inevitable variability in practice. Their widespread preference for the term 'adverse events' for accidents can be understood. (Rosenthal 1995: 19)

According to these previous accounts, it is quite often through this 'systemic' lens, and through a shared understanding of the inherent fallibility of medical work, that errors and mistakes are acknowledged, talked about, accepted—and forgiven. The understanding of errors as inevitable, normal and 'systemic' adverse events makes disclosure easier because it is generally accepted and understood that fallibility is part of the job description as a clinician.

A more recent study by Justin Waring echoes these earlier accounts by suggesting that 'rather than favouring an individualized or 'person-centred' perspective, doctors readily identify 'the system' as a threat to

patient safety' (Waring 2007: 29). However, Waring continues, this understanding of 'the system' is different in important ways from the 'systems thinking' of the patient safety programme, as it is based on 'first-hand experience of clinical work and the wider culture and discourse of medicine' (Waring 2007: 45), instead of abstracted principles of human factors research and safety science. Therefore, when healthcare professionals think in terms of systems—also after the introduction of systems thinking as a discipline—it is not 'a reflection of the prevailing safety discourse or knowledge of policy, but reflects a tacit understanding of how services are (dis)organized' (Waring 2007: 29).

At the same time, however, this particular understanding of error causes one of the most important problems of internal error management within the medical community: Common features of professional etiquette, the shared understanding of the fallible nature of medical work and the inevitability of errors can make incompetence and misconduct hard to define, recognize, judge and manage. As Rosenthal argues, '[t]here is no clear-cut standard for competence; there is no clear-cut way to distinguish between accidents, mishaps, mistakes, errors' (1995: 37). In identifying incompetence, impaired doctors (alcoholic, mentally, physically ill, etc.) or doctors breaking the law might be relatively easy cases, and they are cases in which (at least in principle) the legal system is brought in to decide about the authorization of the clinician in question.[5] But what about the doctors who are getting older and fading in terms of skills? Those who are stressed or growing tired? These are 'grey' areas in which incompetence is often only judged in extreme cases and 'even here mitigating circumstances are usually discovered' (Rosenthal 1995: 99):

> There is no necessary relationship between making mistakes and incompetence. All doctors make mistakes and accept them as part of normal medical practice. It is only when something extreme occurs, the egregious mistake, and particularly if it happens more than once, and where a doctor does not appear to learn from his mistakes, that suspicion of incompetence arise in the minds of colleagues. (Rosenthal 1995: 99)

In this way, the profession's basic understanding of the healthcare system as fallible and errors as adverse and, from an individual perspective,

unavoidable partly constitutes what Rosenthal describes as 'a problem of incompetence' based on insufficient medical self-regulation.

Additionally, it has been argued that the wide acceptance of error as 'systemic', indefinable and non-assignable can serve purposes as strategies for normalizing and excusing below-standard care. According to medical sociologist Eliot Freidson (1975), a 'systemic' understanding of error has not only been widespread in the medical community, but has also been used strategically to excuse incompetence and malpractice. In *Doctoring Together* from 1975 Freidson differentiates between so-called normal mistakes and deviant mistakes. Normal mistakes are described by the medical community as unavoidable events; they 'are less mistakes than they are unavoidable events; they are not so much committed by the doctor as they are suffered or risked. They do not reflect on the physician's competence so much as his luck' (Freidson 1975: 131). Freidson also notices how physicians are reluctant to call these incidents mistakes, and often call them 'so-called mistakes' (1975: 131). These include errors of technique that are, in likeness with Bosk's idea of technical error, understood as a 'natural hazard' (1975: 133). In opposition to the normal mistake, Freidson defines the 'deviant mistake' as an incident in which a clear rule is violated. These are mistakes that are not excusable and which are understood to be due to a practitioner's 'negligence, ignorance, or ineptitude, reflecting upon his lack of basic or reasonable competence, ethicality, conscientiousness, and judgment' (Freidson 1975: 11).

Freidson's account of normal mistakes has important affinities with Paget's understanding of 'the action going wrong', Bosk's technical error, Rosenthal's 'adverse event' as well as with Charles Perrow's later *Normal Accidents* (1984), which has served as an inspirational source for the present patient safety paradigm and its systemic perspective (see Kohn et al. 2000; see Chap. 7). However, as indicated, Freidson's account is not just a description of a specific type of 'systemic' error or mistaken action. It is also a description of a possible rhetorical strategy involving the use of the conception of errors as normal to normalize them and excuse them as unavoidable. Freidson especially criticizes the way that failures in judgement are often excused as a question of 'differences of opinion' whereby an error becomes 'naturalized' (1975: 135). Although Perrow's book does not touch on the possibility of 'misusing' the idea of normal accidents, he

has more recently stated that, at the time of the book's publication, he was anxious that the argument could be used to excuse malpractice.[6] Freidson portrays medical professionals who often excuse, deny or keep their mouths shut about errors at work. If they do discuss errors, it is only as normal mistakes that can be excused because they are unavoidable. Freidson is known to have later revised his critique of the medical profession and not least the idea of medical judgement (Freidson 2001).

Thus, even when we look at the most critical of the earlier accounts of medical culture, the error management of the medical community can hardly be said to be dominated by a person perspective where the first reaction to errors is one of 'naming, blaming and shaming'. Due to the difficulty of defining and assigning misconduct and incompetence, the acceptance of the inevitability and time-dependent character of errors, the acknowledgement of the 'systemic' causes for error and the recognition of mitigating circumstances, it is hard to pass judgement on others' work. Therefore, these studies agree, the problem is rarely too much blame but sometimes too little.

When 'The Problem of Incompetence' Became 'The Problem of Blame'

As a consequence of the sometimes too soft reactions to errors in the medical community, Bosk and Rosenthal both support a strengthening of the system of professional self-regulation by supplementing it with more managerial tools and procedures, especially for dealing with the problem of incompetence. Bosk argues for the necessity of medicine to develop a sense of 'corporate responsibility' to supplement the complex and subtle system of training and nurturing of individual conscience, responsibility and moral character in residents.

> The profession of medicine needs to develop structural remedies—or structure socialization—in a way that brings into balance both the corporate and the individual dimensions of control. Adequate controls in the profession exist only to the degree that a corporate moral sense is cultivated equal to the individual moral sense. (Bosk 2003: 188)

Not least in what Bosk determines as cases of 'dumps'—the silent system for exporting incompetent doctors to other healthcare settings—the profession needs to develop new regulatory mechanisms (2003: 187).

In a similar way, Rosenthal argues that although professional self-regulating mechanisms for monitoring, classifying and managing different sorts of errors are widespread and well-functioning in informal and gentle ways, this professional safety and error management ecology is a delicate practice which need nurturing and support. In her study from the mid-1990s, she addresses the increasing managerial reform pressures in the UK National Health Service (NHS). In general, she welcomes these changes and expresses faith that the new managerial efforts will strengthen the medical community's ability to deal with the problem of incompetence. Hence, she states that '[m]anagers at all levels […] express the opinion that recent changes in the NHS will improve their and the professional's ability to deal more effectively with problem doctors and incompetence' (Rosenthal 1995: 103). The new managerial improvements could, Rosenthal wishes, fruitfully consist of a commitment to more research in errors and incompetence, more systematic attention to the issue and more professional training of healthcare professionals in identifying impaired or difficult personnel—internally and behind closed doors. She equally stresses that 'during the medical education process, there should be frank and open discussion of the problem doctor and the inculcation of a norm of self-appraisal (along with a norm of lifelong peer review) so that doctors will not resist the admission of impairment or problems of competence' (Rosenthal 1995: 145). In this way, Rosenthal wants to support and strengthen the already existing structures of internal professional self-regulation of errors in clinical practice.

Four years before Rosenthal's study, the Harvard Medical Practice Study had established that 3.7 per cent of hospitalized patients in America experience adverse events (injuries caused by medical management) (Brennan et al. 1991; Leape et al. 1991). Today, this study is seen and largely quoted as a forerunner of the safety movement in general and to the American Institute of Medicine report *To Err Is Human* (Kohn et al. 2000) in particular. The Harvard study points to a large variety of causes for error, problems of management and different solutions in which more

systemic perspectives are included as well as questions of negligence and management thereof. Of the mentioned areas of concern, the problem of negligence is determined as 'even more disturbing' than the number of adverse events in general (Brennan et al. 1991: 373). On closer inspection, then, the main safety management problem expressed in the Harvard report is not a problem of blame culture but rather a problem of negligence. The report finds that 28 per cent of the recorded adverse events were due to negligence defined as when 'the standard expected of reasonable medical practitioners' is not met (Brennan et al. 1991: 374). Moreover, it is suggested that the percentage of events attributable to negligence increases with the severity of injuries. As such, more than 50 per cent of deaths were due to negligence. Therefore, the study group points to the need for education and the 'development of better mechanisms of identifying negligent behavior and instituting appropriate corrective or disciplinary action' (Leape et al. 1991: 383). Thus, the problem of incompetence or negligence was not unheard of in the early days of the safety movement.

Five years after Rosenthal's study of the problem of incompetence, the new paradigm for safety management and 'self-appraisal' was introduced in the UK with the seminal *An Organization with a Memory* (2000), the British equivalent to the American *To Err Is Human*. Here a strategy for educating staff in safety issues is formulated in the following manner:

> [A]ll those responsible for the initial and continuing training and education of doctors, nurses and other clinicians should address the development of an approach to frank self-appraisal. This will involve exposing clinicians to the appropriate culture of blame-free assessment and learning at every level, from undergraduate through postgraduate training to life-long learning. (Department of Health 2000: 82)

So while Rosenthal and the authors of *An Organization with a Memory* can agree to suggest a strengthening of staff education, the reasons for this need as well as the proposed tools are poles apart. Where Rosenthal wishes to enhance the professional community's ability to deal with incompetence by creating a stronger focus on and a more open debate about incompetence, malpractice and 'the problem doctor', the new

safety regime is interested in training healthcare professionals in developing 'appropriate' blame-free attitudes by approaching errors as systemic.

What to make of this? First, it seems that the structure of problem and solution to some extent have been switched over in the recent safety programme's assumptions of medical culture. In the 'the old days' the problem of patient safety was not portrayed as a problem of 'naming, blaming and shaming' but rather as a problem of identifying and handling malpractice in an environment where errors and mistakes were, in general, easily, and sometimes too easily, forgiven because of a shared understanding of medical work as fallible, errors as time-dependent and hard to define, and an inherent vulnerability of the medical ethos. Second, a number of practices and technologies for identifying errors including processes for assigning responsibility, blame or self-blame are identified. The operations and effects of the Mortality and Morbidity Conference is one such example that allows errors to be detected, responsibility to be assigned, self-blame to be disclosed—while viewing medicine as inherently fallible. If reform of medical culture is asked for in these sociological accounts, it is reforms that strengthen such internal procedures to identify error and deal with them in local, professional and gentle yet effective ways.

All the 'Greys' of Responsibility: The Consequences of Banning Blame

An important lesson to be drawn from the sociological accounts of error management and professional self-regulation presented in this chapter concerns the large number of grey areas that fall between the clear-cut 'systemic error' and the clear-cut case of negligence, as well as the hard work that goes into identifying and classifying what type of errors would lead to what type of responses. One of the main constituents of the problem of incompetence concerns exactly this difficulty of identifying what is to count as incompetence in particular cases, which is why some of the presented accounts argue for safeguarding and strengthening the processes of and abilities to identify malpractice within the professional community.

In opposition to this, it is often presupposed with a blame-free perspective that it only makes sense to address issues of personal responsibility and blame in rare cases of negligence. Equally important, the safety programme is built on the assumption that the few cases of negligence are so easily identified that they can be determined as negligence *before* they are treated within the programme. This is, for example, the case in relation to root cause analysis processes that are not conducted in clear cases of impairment or negligence. When conducted, they are specifically designed to not assign blame or liability to individuals and as such the possibility of identifying incompetence, misconduct or simply different kinds of responsibility and obligations are most often hindered during these sessions with a reference to its blame-free ideal (this dilemma is further discussed in Chap. 5). Thus, as a consequence of the blame-free perspective, it is expected that in order to be managed, acts must be so clear-cut negligent that they naturally fall outside the patient safety programme's systems for dealing with errors systemically and can be handled by other authorities. This happens in rare cases where, for instance, alcoholism or unlawful activities are easily identified as the causes of errors. Consequently, there are—roughly speaking—two possible positions a healthcare professional can hold in relation to error: either you are guilty of negligence or the error is to be understood as systemic and you are then not to be blamed. In this way, present safety policy risks missing all the errors 'in between', such as Paget's 'mistakes' i.e., competent acts going wrong, or, one would expect, the milder cases of Bosk's normative errors, as well as the serious but less easily identifiable cases of incompetence. With only two possible convictions for the health professional, guilty or not guilty, which are often to be identified before the investigation of an incident takes place, blame-free strategies are likely to interfere with and inhibit processes of identifying malpractice because they remove the possibility of addressing different sorts of professional, moral and individual involvement with and responsibility for errors. In this way, the delicate structures for professional identification, regulation and self-control of errors and malpractice—which have earlier been identified as such an elementary part of medical practice—risk being obscured.

It is not only the possibility of identifying cases of malpractice that is likely to be affected by the blame-free strategies but the very normative

structures of the office of practicing medicine. In Bosk's preface to the 2003 edition of his study on medical error, he comments on the new blame-free paradigm by asking whether it is possible to change one part of a culture without changing other parts. Is it possible to eliminate blaming and shaming without also affecting structures of professional responsibility in important ways? Specifically, Bosk points to the importance of the cases of self-inflicted blaming, as identified, for instance, in the Mortality and Morbidity Conference of Bosk's study where attendings 'put on the hair shirt' and confess their mistakes publicly 'to demonstrate to the community just how seriously they take their responsibilities to patients' (Bosk 2003: xxiv). Newer studies have given similar defences of the important function of self-blame (e.g., Collins et al. 2009; Wachter and Pronovost 2009). According to Bosk, issues of self-blame and professional management of incompetence raise a number of general questions as to what 'the limits are to curbing the processes of "naming, blaming and shaming"' (2003: xxvi), as well as to 'the costs involved in our current practices for installing a sense of professional responsibility' (Bosk 2003: xxvi). Bosk concludes with an invitation to think about 'mismatches created by changes in the organization of medical practice' (Bosk 2003: xxvi).

This chapter has taken up this challenge by pointing to such possible mismatches, and by showing how important tensions come to the forefront when relating accounts of medical practice, safety cultures and responsibility structures comprised in previous studies of medical error and error management with contemporary modes of safety management. First, it is found that the image of a dominant culture of 'naming, blaming and shaming', which unequivocally summons both earlier and current narratives of medical practice, dissolves when looking closely at actual accounts of medical practice. Instead, a fragile ecology of co-collegial and informal error management is found consisting of processes of monitoring, sorting and managing error, which might result in forgiveness, understanding or, in some cases, the assignment of blame and self-blame. Such mechanisms are anything but problematic. Rather, they are necessary and important measures in the training of clinicians and in dealing with both forgiveness, which is likely to generate a sense of responsibility in the person who is forgiven, and problems of moral and

clinical incompetence, which help set the limits of office. Conclusively, the main problem is not too many internal professional control mechanisms. Because, what follows from a shared understanding of the fallible nature of medical work and the shared vulnerability of the medical ethos is an environment where understanding and forgiveness is easy, sometimes too easy. And, as such, the main challenge consists in, first, determining and setting apart different sorts of errors, mistakes and acts of incompetence and, second, making sure professional structures are in place to manage these various kinds of failure in gentle, yet effective and decisive ways. As the vocabulary of the mistake and the problem of incompetence have disappeared from today's safety methodology and discourse, it is reasonable to think that conditions for sorting and managing various forms of error, mistake and incompetence within the professional community have weakened. Here, the problem of incompetence is only one concern of many which relates to changing the clinical situation by weakening or even dissolving the constitutive relationship between the medical error and the responsibilities and obligations of the healthcare professional.

Notes

1. These earlier studies all investigate the medical communities from within. They do not deal with the public or political view of medical culture, which might at times well be dominated by an attitude of 'naming, blaming and shaming'. Also, they do not deal with the problem of rising liability suits and malpractice claims.
2. That medicine has a problematic relationship with probability per se can easily be contested. As Foucault argues in *The Birth of the Clinic* (1994/1963), the collection of sick into clinical hospitals in the late eighteenth century became the start of the development of medical statistics. Disease also came to be viewed epidemiologically—as the distribution of morbidity in a population, and in terms of the statistical likelihood of becoming ill, being cured, dying, and so on.
3. While Rosenthal's analyses are predominantly based on British material, she shortly refers to a Swedish case. In the Swedish case, she concludes that 'there is even greater reluctance to criticize, not only because of cultural

norms that discourage public criticism of anyone. Problem doctors are a "forbidden" subject, a subject of shame that one of their numbers should be causing problems or found to be incompetent' (Rosenthal 1995: 106). She further suggests that the 'export' problem where a problem doctor is exported to somewhere else in the healthcare system is more evident in Sweden, where jobs are changed more frequently.

4. Is not entirely clear what Rosenthal means when she speaks about formality and informality. Obviously, that something is internal, and behind closed doors, does not exempt it from being formalized. Most often, however, it seems that Rosenthal is not talking about the degree of formalization but rather the degree of 'closedness': When measures are taken by and of professionals only, she describes them as informal. When they include management, they are quasi-formal. And when they are public, they are formal.
5. In the Danish legal system, questions of impairment and negligence are regulated in Law of Authorization (LBK no. 877), in which §6 establishes that Danish Health Authority can withdraw authorization because of physical or mental illness or drug/alcohol addiction while §7 on negligence concerns instances of serious or repeated 'criticizable professional conduct'.
6. Personal comment, September 18, 2012, internal seminar at Department of Organization, Copenhagen Business School.

References

Atkinson, P. A. (1984). Training for certainty. *Social Science and Medicine, 19*, 949–956.

Bosk, C. L. (1979/2003). *Forgive and remember: Managing medical failure* (2nd ed.). Chicago: The University of Chicago Press.

Brennan, T. A., Leape, L. L., Laird, N., et al. (1991). Incidence of adverse events and negligence in hospitalized patients: Results from the Harvard Medical Practice Study I. *New England Journal of Medicine, 324*, 370–376.

Cassell, J. (2002). Social scientists studying doctors: 1951 to 2001. *Reviews in Anthropology, 31*(3), 243–262.

Collins, M. E., Block, S. D., Arnold, R. M., & Christakis, N. A. (2009). On the prospects for a blame-free medical culture. *Social Science and Medicine, 69*(9), 1287–1290.

Department of Health. (2000). *An organisation with a memory: Expert group report*. London: Department of Health.

Foucault, M. (1994). *The birth of the clinic: An archaeology of medical perception*. French edn 1963, English edn 1973. New York: Vintage Books.

Fox, R. (1957). Training for uncertainty. In R. K. Merton, G. Reader, & P. L. Kendall (Eds.), *The student-physician: Introductory studies in the sociology of medical education* (pp. 207–241). Cambridge, MA: Harvard University Press.

Fox, R. (1959). *Experiment perilous: Physicians and patients facing the unknown*. New Brunswick, NJ: Transaction Publishers.

Fox, R. C. (1980). The evolution of medical uncertainty. *The Milbank Memorial Fund Quarterly. Health and Society, 58*(1), 1–49.

Fox, R. C. (2000). Medical uncertainty revisited. In G. L. Albrecht, R. Fitzpatrick, & S. C. Scrimshaw (Eds.), *The handbook of social studies in health and medicine* (pp. 409–427). London: Sage Publications.

Fox, R. C., & Swazey, J. (1974). *The courage to fail: A social view of organ transplants and dialysis*. Chicago: University of Chicago Press.

Freidson, E. (1975). *Doctoring together: A study of professional social control*. Chicago: University of Chicago Press.

Freidson, E. (2001). *Professionalism, the third logic: On the practice of knowledge*. Chicago: The University of Chicago Press.

Gorovitz, S., & MacIntyre, A. (1976). Toward a theory of medical fallibility. *Journal of Medicine and Philosophy, 1*(1), 51–53.

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To err is human: Building a safer health system*. Committee on Quality of Healthcare in America, Institute of Medicine. Washington, DC: National Academy Press.

Leape, L. L., Brennan, T. A., Laird, N., et al. (1991). The nature of adverse events in hospitalized patients: Results of the Harvard Medical Practice Study II. *New England Journal of Medicine, 324*(6), 377–384.

Leape, L. L., Woods, D. D., Hatlie, M. J., et al. (1998). Promoting patient safety by preventing medical error. *JAMA, 280*(16), 1444–1447.

Paget, M. (1988). *The unity of mistake: A phenomenological interpretation of medical work*. Philadelphia: Temple University Press.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.

Reason, J. (1990). *Human error*. Cambridge: Cambridge University Press.

Reason, J. (2000). Human error: Models and management. *BMJ, 320*, 768–770.

Rosenthal, M. M. (1995). *The incompetent doctor: Behind closed doors*. Philadelphia: Open University Press.

Timmermans, S., & Angell, A. (2001). Evidence-based medicine, clinical uncertainty, and learning to doctor. *Journal of Health and Social Behavior, 42*(4), 342–359.

Wachter, R. M., & Pronovost, P. J. (2009). Balancing no-blame with accountability in patient safety. *New England Journal of Medicine, 361*, 1401–1406.

Waring, J. (2007). Doctors' thinking about 'the system' as a threat to patient safety. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine, 11*(1), 29–46.

WHO. (2011). *Multi-professional patient safety curriculum guide*. Geneva, Switzerland: World Health Organization.

Woodward, H., Lemer, C., & Wu, A. (2009). An end to the witch hunts: Responding to the defenders of blame and shame: A commentary on Collins, Block, Arnold and Christakis. *Social Science and Medicine, 69*(9), 1291–1293.

5

The Distributed Risks of Safety Management

The myth of risk elimination has been at the heart of patient safety efforts since the inception of the patient safety programme in the late 1990s. Thus, the main message of the programme, and the founding structure of its management ideals, is that the most effective way of creating safety and preventing error in healthcare organizations is by the elimination of the factors that lead to error; it is by eliminating the risk of error. Inspired by human factors research, safety improvement efforts must strive to remove the risk of error and the latent failures in healthcare organizations by creating systems that are as failsafe as possible, designed in ways that make it difficult or even impossible to make mistakes. In mainstream patient safety literature, the idea of risk elimination and the faith in failsafe systems are equally asserted by the notion of preventability, often expressed in the idea of 'preventable' adverse events or medical errors. In describing medical errors as preventable or, even more powerfully, in describing the *deaths* caused by medical errors as preventable, a serious problem in need of management is instituted. As when, for instance, the recurrently repeated *To Err Is Human* (Kohn et al. 2000) estimate that between 44,000 and 98,000 Americans die every year due to medical errors is reformulated as '98,000 preventable deaths' (Leape 2009). Here it is implicitly assumed that the right safety system or failsafe procedure

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7_5

could have eliminated the risk of error and prevented the death of the patient had these systems just been optimally implemented. Interestingly, the new resilience perspective on safety, Safety II, also promotes an ideal of risk elimination, although this is not to be obtained through error elimination but rather through error absorption in robust, flexible and resilient healthcare systems (e.g., Hollnagel et al. 2013, 2015).

In this chapter, I suggest—by reference to empirical study and social-scientific research—that rather than being eliminated, risks, uncertainties and problems are redistributed. Patient safety efforts have unintended consequences that lead to new organizational challenges and to subtle and often invisible reconfigurations of professional work, attention, responsibilities and risks—also, or even particularly—when these managerial accomplishments are implemented and performed as planned. In the case of the introduction of oral syringes (Chap. 2), a long list of unintended consequences in terms of technical, economical, culture and coordination problems was identified. In addition, new types of patient safety risks were introduced into healthcare. The syringes case is not interesting as a case of implementation problems or as a discussion of ineffective technological solutions, but because it presents us with the question of what *also* happens when safety management succeeds in being implemented and institutionalized as part of healthcare practices.

A number of now classic studies within risk management and Science and Technology Studies have attended to this question of the constitutive effects, unintended consequences and distributed risks of rationalizing, self-monitoring and standardizing technologies in healthcare (e.g., Berg 1997; Bowker and Star 1999; Power 2007; Strathern 2000a, b; Timmermans and Berg 2003; Vikkelsø 2005). As for patient safety specifically, parts of the more critically inclined social-scientific literature have focused on some of the challenges and unintended effects of the programme on a general level (e.g., Dodds and Kodate 2011; Jensen 2008; Waring 2007; Zuiderent-Jerak and Berg 2010; Allen et al. 2016). Moreover, studies have attended to the unwanted consequences connected to parts of the programme as, for example, the blame-free strategies (e.g., Collins et al. 2009; Wachter and Pronovost 2009), or of its specific technologies such as the root cause analysis (RCA) (e.g., Iedema et al. 2006; Mengis and Nicolini 2011).

In the remainder of this chapter, I suggest a tentative grouping of some of the unwanted consequences and distributed risks of safety management by presenting four risk categories. The term 'risk' has increasingly, and not only within areas of risk management, come to mean calculable risk. From this perspective, the notion of risk is used to determine when threats, dangers, vulnerabilities or problems are constituted as measurable risk objects, most often through probability measures, while striving to account for and manage them. When the term risk is used here it is not, however, to indicate the possibility of assigning probability to the discussed unintended consequences and new safety threats that follows from the introduction of patient safety technology in healthcare practices. Rather, risk should be understood as unwanted potential consequences, as a situation that involves 'the possibility of loss, injury, or other adverse or unwelcome circumstance' (Oxford English Dictionary). That being said, the accountability claim attributed to the risk label should be held in mind in discussions on how, when managing some risk via certain types of risk management tools, new areas of concern arise that must equally be attended to and accounted for; they are the risk of risk management.

The four risks do not constitute a comprehensive or stable list but rather a necessarily temporary and tentative grouping of which the number, content and bracketing could have been otherwise. However, the four identified risk areas seem useful in establishing a frame for discussing the unwanted consequences of safety management. Apart from being temporary the categorization is also situated, as it is primarily based on empirical observations from the Danish healthcare setting.

Classification Risk: The Reportable and the Invisible

The safety programme, and its challenge of the 'old ways' of internal medical error management, is essentially changing the way errors and risks are identified, classified and handled in healthcare organizations.

Defined as 'the prevention of harm to patients' (Kohn et al. 2000) or as 'the prevention of errors and adverse effects to patients associated with health care' (WHO 2016), patient safety is inextricably linked to the identification and classification of categories such as 'adverse events', 'clinical incidents', 'adverse effects', 'harm' and 'medical error'. That is, the programme is dependent on the possibility of easily transforming vulnerable clinical situations or adverse patient effects into well-defined and delineated incidents that can be codified, classified, reported, counted and managed. As such, an organizing tool in the appearance of countable risk objects (Hilgartner 1992) has been introduced into healthcare with the safety programme. And nowhere is this more evident than in the case of critical incident reporting.

It is well known that classification processes in healthcare (Bowker and Star 1999), and more specifically decisions about what categories to include in risk management programmes, 'are inherently moral and political and are riddled with difficulties' (Lloyd-Bostock and Hutter 2008: 77). Earlier sociological studies of informal processes of error detection and management in clinical practice attest to the difficulty as well as to the lengthy process of determining and setting apart different sorts of errors, mistakes and acts of incompetence within the professional community (Rosenthal 1995; Bosk 2003—see Chap. 4). They point to all the different types of mistakes, misconduct, slips, incompetence, adverse effects and all the grey areas in between and beyond. And they point to the danger of disconnecting the identification of such error with the internal co-collegial processes of monitoring, sorting, taking responsibility for, forgiving, understanding, blaming or punishing error as a vital part of clinical practice and as a precondition for determining the limits of the medical office.

The classification processes that are the basis of critical incident reporting and subsequent processes of incident analysis are of a different sort. They are rarely based on a lengthy and shared process of error identification and definition, but rather decided by the individual healthcare professional ideally on the basis of some predetermined criteria. In close alignment with international definitions, the official Danish classificatory principles for determining a critical incident

include the following three rules: The incident must occur during or in relation to a treatment programme; the incident should be independent of the patient's illness; and the incident must be harmful or potentially harmful for the patient (Ministry of Interior and Health 2011). However, this definition does not prevent the following questions: When does treatment stop? What about cases, for instance, of outpatient treatment? And where is the dividing line between a critical incident and a known complication? Should a central line infection be reported? And, what counts as harmful and as the even more ambiguous 'potentially harmful'? Is, for instance, unworthy, undignified or disrespectful treatment—like that of my mother's case from the Preface of this book—harmful or potentially harmful? These are all difficult questions to answer in concrete clinical situations. Moreover, the vague delineations of what incidents to report make the definition potentially amorphous and almost all irregularities and incidents could fit the criteria: Water on the floor, a misplaced drug, a technical failure in the electronic system, staff shortage or incidences of miscommunication could all *potentially* lead to patient harm.

While it is often argued that a possible result of vague and insufficient definitions and methods is that the identification of incidents is likely to be arbitrary and highly subjective, it seems that another tendency is more dominant in patient safety practices: Namely, because of the potentially all-encompassing definition of the clinical incident, health professionals tend to think of only certain types of incident as reportable based on, for instance, signals from clinical management and safety representatives, reporting culture and the particular set-up of the electronic reporting scheme. In this way, the incidents reported most often predetermine the rules and structures of the classification scheme whereby serious safety critical situations that do not fit into these structures fall outside the domain of safety management.

A colleague and I were met with some of these dilemmas of classification in our study of safety management in elderly care units (Jensen and Pedersen 2010). The Danish municipality that was the object of our study had recently introduced critical incident reporting (a few years before it was made obligatory for the primary health sector), and the large

majority of reported events were related to the medication processes. A nurse in a homecare team describes this phenomenon:

> Medication errors are measurable. It is always described whether a citizen is to have two or three tablets. But in wound care we may fluctuate, here it's okay to choose between different types of medical preparations. It isn't the same, however, whether you choose to give two or three tablets.

In a similar way, a social and health helper and a nurse assistant in a focus group interview explain:

> *Helper*: 'I think it's the procedures connected to the medication process that helps us to maintain our attention to it.' *Assistant*: 'We have a number of procedures to follow, so there's nothing to discuss. We can't really choose.' *Helper*: 'It's more tangible. It doesn't add up here, so I'll call an assistant and she can tell me if it's an error or not.'

As implied in these quotes, some areas—especially the strictly regulated medication area—make it easier for the personnel to decide if a situation is a deviance and, hence, can be defined as a critical incident; the more procedures, rules and standards there are, the more potential for breaches of these. This is not an unimportant point, as adverse drug incidents most often constitute the largest incident category. In 2015, 65 per cent of the more than 115,000 reported incidents in Danish municipalities were related to medication handling and administration. Of these the majority of incidents concerned drugs *not* administered to the patients (The Danish Patient Safety Authority 2016). If all healthcare settings are included, medication incidents amounted to almost half of the reported incidents (The Danish Patient Safety Authority 2016). Apart from the medication area, other formalized areas such as administrative processes and documentation concerning, for instance, discharge or prescription processes constitute categories of high frequency, as well as a few specific, predescribed and well-defined situations of which the category 'patient injury' (e.g., fall accidents and burns) constitutes the largest group of reported incidents (The Danish Patient Safety Authority 2016). In this way, the new accountability claims imposed by incident reporting

primarily apply to certain predetermined parts of healthcare work that are already measurable and formalized.

This leaves us with the important question of those situations which, in the words of Bowker and Star, 'do not fit easily into our magical created world of standards and classifications: the left handers in the world of right-handed magic' (1999: 9). Because, while the strictly regulated areas make it easy for the health personnel to decide if an incident is 'deviant' and hence can be defined as a critical incident, areas or situations that are not as easily addressable are likely to be discounted by the reporting system. As the nurse from the homecare team suggests in relation to wound care, infections might be one such area. Although hospital infections are globally understood as one of the uppermost important threats to patient safety (see, for instance, Klevens et al. 2007; WHO 2011), they constituted less than 1 per cent of the reported incidents in the Danish system for incident reporting in 2015 (The Danish Patient Safety Authority 2016).

Other types of less easily addressable incidents can be found in the large array of healthcare practices that are best captured by the term 'invisible work'. Bowker and Star have argued that when work is invisible, or when it 'just gets done', it is by definition unclassifiable and hence not reportable (1999: 232). Such 'invisible' areas, where skills and practices are being backgrounded because they are not regulated and standardized, can be found in all organizational work (Star and Strauss 1999). Within the healthcare area, it has been suggested that especially a large part of nursing and much of general care practices are of such a character (Bowker et al. 1995). Other incidents that fit badly into the classification schemes are cases of clinical discretion and issues of following codes of conduct, i.e., all the safety questions in need of an interpretation from the medical community in order to define accepted medical practice or transgressions of the boundaries of office (see Chap. 4).

Thus, while one set of unintended consequences following from the introduction of incident reporting concern the tendency to draw attention towards the already highly rule-bound, regulated and standardized areas of healthcare with the possible further regulation of these areas as a

result, a second set of unintended consequences concerns the risk of thereby ignoring the discretionary, normative and more invisible areas of care and treatment. What is more, the quantification processes—which are the outcome of the introduction of a classification system such as incident reporting—almost inevitably create new kinds of accountability claims and new possibilities for surveillance and standardization—even when such possibilities of surveillance were not necessarily the reason for introducing the classification system in the first place (Bowker and Star 1999). Following Power's definition of risk management, incident reporting as a practice is part of the more general process of 'turning organisations "inside out" and of making their risk-based internal control systems a public and potential disclosable matter' (Power 2004: 3). Hence, reporting does not only create more regulation and standardization within certain areas (such as medication and drug administration) but also a host of new types of organizational practices for measuring, optimizing and working with the numbers provided by the reporting systems.

Interestingly, the classification and quantification of critical incidents pose a problem for the safety programme as it is not obvious how the result of the many efforts of classifying, reporting and measuring incidents should be interpreted. These new claims for public disclosure of quantifiable safety management information such as statistics on critical incidents, on the one hand, and the goal of creating learning and reporting cultures in healthcare, on the other, pose an interesting case of what Dodds and Kodate (2011) have determined as the programme's conflicting logics between learning goals and accountability claims. When approached from a 'learning perspective', the number of reported incidents is an indication of culture, not the actual safety of patients. As such, a high number of reported incidents can be seen as a sign of an excellent culture of reporting. However, looked upon with the lens of the accountability agenda, a high number of reports might be understood as a sign of too many medical errors. Likewise, a drop in reported incidents can signal worsening (poorer safety culture) from a learning perspective or improvement (less errors) from an accountability perspective. Officially, especially in the Danish debate where the blame-free, non-sanctioning learning perspective on patient safety has been heavily implemented, the opinion of the promoters of the safety programme is clear: The number of reports is 'only' a sign of safety culture, not actual errors. However, in

relation to the registration of incidents, this is a somewhat ambivalent position to hold and therefore the purpose of the more than 189,000 yearly reports to the National Danish Patient Safety Database (The Danish Patient Safety Authority 2017) is anything but clear although it is most often described as a question of collecting and analysing information that can point to focus areas for future safety efforts (Ministry of Interior and Health 2011). At the same time, however, it is explicitly stated that

> the National Danish Patient Safety Database is generally not a statistically workable system. The number of reported incidents is affected by a number of factors, such as periodic focus areas in health care. Data should therefore not be used in statistical analysis. (The Danish Patient Safety Authority 2016:13)

A claim that is somewhat paradoxical is that the annual report from the database is exactly a numerical account of developments in reported events from different parts of the healthcare system and within different focus areas.

This ambiguity is not only reflected at the policy level but at the organizational level as well. At the university hospital that formed the main empirical site for my ethnographic study of patient safety technologies and practices, this ambivalence was shown in the fact that, on the one hand, a high number of reported incidents was a celebrated occasion. Each year the clinic with the highest number of reported incidents was awarded with a small celebration ceremony by top management. At the same time, however, I sat in on courses where quality and patient safety representatives were taught how to draw out numerical information and statistics from reported incidents. So, in spite of the strong efforts, at least rhetorically, to argue that reporting is *not* about numbers and statistics, the reporting system as a technology with specific outcomes seems to perform reality in a certain 'measurable' way, which produces numbers and statistics with a certain performative power.

The accountability claims that are occasioned by the quantification of critical incidents are most vividly expressed in press and public opinion. Consequently, external communication efforts are challenging, as it takes significant efforts to convince the press and the public that a high number

of reported incidents are not to be interpreted as medical error or negligence but as an indication of safety and learning culture. It has further been argued that, while the official message is otherwise, the widespread 'measure and manage' strategy of the programme is likely to benefit and foster calls for organizational accountability and measurability at the expense of clinical learning and coping (Waring 2009; Iedema 2007).

In sum, the production of errors and critical incidents as new measurable risk objects—and the parallel process of concealment, which is always the other side of the construction of transparency (Strathern 2000b)—points to some problematic consequences of the error classification strategies that are the precondition for incident reporting. Classification processes will, on the one hand, introduce new accountability claims which have the potential to dislocate original policy goals and, on the other, create 'blind spots' where important safety concerns are likely to be disregarded simply because they do not 'fit into' classification practices. Instead of the complicated, lengthy, informal process of co-collegial error definition, detection and management described by the earlier sociological studies of medical error (Bosk 2003; Rosenthal 1995; see Chap. 4), the classificatory strategies introduced with incident reporting cause incidents to be chosen from primary criteria of measurability and manageability. Additionally, this is likely to create tensions and trade-offs between increased time, energy and attention spent on the safety management of already highly formalized, procedure-bound and technical areas such as medication, on the one hand, and more invisible parts of healthcare and safety work, on the other. Such tensions lead us on to the next risk category concerning the production of second-order risk.

Second-Order Risk: Tensions and Trade-Offs between First- and Second-Order Safety Work

In *Organized Uncertainty* (2007), Michael Power argues that the growth in risk management practices has led to an increased focus on risk management for secondary and defensive purposes. Thus he describes a main side effect of the risk management regime as the production of 'second-order' risks, which he also labels 'systems and control risks' (Power 2007:

62), referring to a type of risk related to the introduction of risk management systems and technologies rather than to the actual practices these systems are seeking to survey, measure and manage. Power's concept of reputational risks can also be considered as a particular type of second-order risk understood as the increased organizational attention towards risk management as a way of responding to reputational pressures for living up to ideals of good governance and responsible actorhood (Power et al. 2009).

When translated into the field of patient safety, the term second-order risk can be used to describe the construction of new kinds of risks, which are not related to primary work tasks but to costs in terms of time, energy and focus associated with implementing and spreading patient safety thinking and practices and keeping the patient safety technologies and procedures running. Thus, second-order risk is a concept that draws attention to possible redistributions of focus from the concrete clinical situation, or from what could be determined as first-order safety issues, to second-order processes, such as the implementation and maintenance of the technologies themselves. Such redistributions show themselves as specific side effects of quality and safety technologies such as reporting and classification systems, medical information systems or specific safety technologies and procedures (see, for instance, Pirnejad and Bal 2011; Vikkelsø 2005; Jerak-Zuiderent 2012), but they are equally likely to occur as a result of a gradual shift in the meaning of, and discourse on, quality and safety caused by the introduction and institutionalization of safety policy and technology.

One place in which such a gradual shift can be seen is in the terminological change of the concept of 'patient safety'. As the programme has become increasingly institutionalized, the term patient safety has gradually shifted its meaning and on Wikipedia patient safety is now defined as 'a new healthcare discipline that emphasizes the preventing, reducing, reporting and analysis of medical error that often leads to adverse healthcare events'.[1] By defining patient safety not only as safe treatment or prevention of harm but as a particular discipline, a particular way of doing patient safety, a shift from first-order to second-order safety can be detected.

This tendency is equally detectable on the organizational level. At the Danish university hospital where I conducted my empirical study, patient safety had come to signal both more and less than the safe treatment of patients. For the people working with patient safety, the term was used to describe processes and problems relating to the safety technologies themselves. A quote from the hospital's risk manager illustrates this displacement. When asked about the level of patient safety in the hospital, she answered thus:

> I sense a very high general knowledge about patient safety and a common willingness to 'talk patient safety' at the hospital. You can get out at any clinic and everyone will know what the term 'patient safety' means and where to report an adverse event. But we do still have challenges. One concerns the implementation of action plans in relation to root cause analyses. The next great challenge is to create more confidence in relation to reporting critical incidents, so we reduce the number of anonymous reports; and lastly we have a major challenge in relation to securing feedback, which could definitely be done more satisfyingly.

According to this, 'patient safety' primarily refers to a discipline, i.e., to the policy programme and its technologies, and this means that the level of safety at the hospital is measured in terms of how well the technologies are implemented: Are patient safety tools and technologies such as incident reporting and analysis well implemented and disseminated? Is reporting done anonymously? Is the feedback satisfying? As described in Chap. 2, the success of the programme is measured on the 'safety culture' understood as adaptation of and commitment to the patient safety programme. Although the quote signals a successful institutionalization of the hospital's safety policies, the empirical study showed that strong institutionalization simultaneously created tensed situations in which first-order safety issues, that is securing safe treatment of the patient in concrete clinical situations and second-order safety issues, that is practising the discipline of patient safety, were not in alignment. A case concerning an overstretched medical clinic at the hospital is illustrative: A similar clinic in one of the region's other hospitals was closing down and both staff and

patients were transferred to the university hospital. At a quality team meeting, a patient safety representative at the clinic described the situation as follows:

> Our situation is very chaotic. There has been no time to properly introduce the new personnel. Normally all new staff receives a four-day introduction course but in this case they started without knowing the local conditions and without having, for example, a fire course. This situation is the reason we have not been doing any patient safety work lately. It isn't even in the back of our minds right now.

Here, the notion of 'patient safety work' does not refer to the everyday work done to secure the safety of the patients at the clinic. Neither does it refer to the missing introduction and fire courses, something one would readily identify as important safety concerns in the given situation. Instead, what the patient safety representative referred to was the work created by the safety technologies and procedures, that is, reporting and handling critical incidents, conducting RCA, implementing new regional patient safety guidelines, doing safety rounds, and so forth. It was these work tasks that were not 'in the back of their minds' in the given situation. And this is possibly not a bad thing, one might add, in a situation where focus must necessarily be on securing the most basic level of care and safety for the patients before attending to the secondary work created by control functions. Hence, tensions and trade-offs were created between first- and second-order patient safety because, first, safety issues such as educating new staff were not defined as being part of 'safety work' and, second, it is reasonable to think that spending time on second-order safety work could, in a critical situation like this, compromise the safety of patients. This second tension concerns a paradox of time that is ever present in relation to the running of safety technologies. The paradox can be exemplified by the fact that in situations of time pressure, where things are more likely to go wrong, the healthcare professionals are less likely to have time to do second-order safety work such as reporting and managing critical incidents.

Second-order work is inevitable. Any new regulating effort related to the introduction of quality or safety programmes or, on an even more

general note, every well-implemented management tool produces new second-order work tasks and thereby redistributes focus, responsibilities and attentiveness to risks and safety. However, such redistributions, inevitable or not, can become problematic when they inhibit the possibilities of reacting to the particular risks, safety concerns or needs of the particular clinical situation because second-order work becomes primary.

Standardization Risk: Redistribution of Uncertainty

The third risk category addresses the potentially unwanted consequences connected to the safety programme's standardization requirements and ideals. The increase of standardization in healthcare, especially in terms of the demand for evidence-based medicine, has not gone unnoticed within medical sociology and science studies (e.g., Berg 1997; Timmermans and Berg 2003; Timmermans and Mauck 2005). In relation to the patient safety programme, the standardization quest dominates both methods and solutions, and although standardization is perhaps *the* dominant organizing principle of contemporary safety management, it is at the same time the most criticized part of the programme, as the 'one size fits all' attitude of the programme is said to undermine the complexity and situated status of risk, healthcare practices and clinical work (e.g., Iedema 2009; Iedema et al. 2006; Waring 2009; Jerak-Zuiderent 2012; Pedersen 2016). In Chap. 7, I describe how the critique of standardization has resulted in recent calls for resilience within safety management, but equally how some of the assumptions of the standardization paradigm are reproduced in the quest to introduce resilience and adaptation as new principles to secure failsafe organizing (see also Pedersen 2016).

The emphasis on standardization is supported, as aforementioned, by the programme's failsafe systems approach stating that safety is best ensured by creating systems that reduce variation and make it as hard as possible for healthcare professionals to make mistakes (e.g., Kohn et al. 2000; Leape 1997). With frequent reference to James Reason's (1990) Swiss Cheese Model (see Chap. 3, Fig. 3.1), it is argued that safety is

about closing the safety gaps in a seemingly stable system by creating solutions that are as independent of the healthcare professional's individual memory and experience as possible. While there might well be advantages of this approach in particular instances, problems arise when new standards, checklists, guidelines and protocols by default become the obvious answer to safety problems. Because when the illusion of certainty on which the standardization quest is founded is too rigidly imposed in healthcare settings, it poses a challenge to the way medical work and knowledge is unfolding in the clinical situation, where work is developing, reasoning is case-based, practices are pragmatic and clinical judgements involve a practical combination of biomedical knowledge and the situated, developing and partial knowledge about a particular patient at a particular point in time. Here Charles Perrow's (1984) warning about how complex organizations interact and interrelate in ways which are not entirely predictable must also remind us that we cannot always expect incidents to be prevented by the adoption of standardized solutions; we cannot expect certainty and predictability.

To illustrate some classic dilemmas of the standardization approach, I turn to the safety programme's primary method of investigating critical incidents, the RCA. The RCA can be understood as a rationalization process that endeavours to present a comprehensible and linear chain of events, followed by the determination of a number of root causes. These causes are each followed by an action plan developed to avoid future incidents of a similar kind (Department of Health 2001; Murphy et al. 2009). The RCA relates to the question of standardization in two ways. First, as a methodology the RCA is highly standardized. The incident analysis follows predetermined casually connected steps and asks standardized questions regarding the incident under investigation. Second, the action plans produced as an outcome of the RCA predominantly consist of new standardized protocols, checklists or variation-reducing failsafe systems that are each, as part of the RCA process, evaluated in terms of their ability to 'eliminate' the cause of the incident (see also Chaps. 3, 6 and 7). In line with this, a quality coordinator at the Danish university hospital defines the purpose of the RCA as follows: 'It's all about finding out if the written standards are good enough but just haven't been implemented or whether you need to come up with a new

guideline.' Thus, standards are understood to be the object as well as the outcome of the analysis from the outset.

One problem with this default production of standards is that the introduction and use of standardized solutions are rarely questioned in healthcare. Studies have shown that although the formal descriptions of the RCA often clash with the situated reality of clinical work, the standards suggested in RCA action plans are often used in a non-problematic way in healthcare practices (Iedema et al. 2006; Mengis and Nicolini 2011).

Another problem concerns the illusion of certainty that standardization can impose on practice. Let us consider an RCA concerning a child who was transferred from a regional hospital to the Danish university hospital. At the regional hospital, the child began treatment for what turned out to be a mistaken diagnosis and, after the transfer, the child remained on the mistaken clinical pathway for three months until a brain tumour was detected. Although the tumour had been present at all previous scans, it was only detected by chance. The tumour was removed and the child survived, but because of the misdiagnosis the tumour had grown larger, making the operation more risky. Moreover, the child had been kept unnecessarily on strong medication with considerable side effects for months. In the process of looking for root causes to describe how the personnel at the university hospital could have missed the tumour during the transfer and throughout the three-month period of misdiagnosis and mistreatment, the focus in the RCA sessions was primarily directed towards 'what went wrong' during the handover between hospitals. It was quickly agreed that the main problem of the incident was that the university hospital's radiologists did not get to see and therefore comment on the child's scan images from the regional hospital when these first arrived. More specifically it was argued that because the diagnosis made at the other hospital was trusted, the radiologists at the university hospital never conducted their own investigation of the scans and when, in the following months, the scans were looked at the radiologists always only concentrated on specific parts of the scan images, never making a new overall assessment although such, they agree, would most likely have revealed the misdiagnosis. On this basis, the RCA then poses the question: What procedures, rules or failsafe systems (which are readily implementable) can prevent future incidents of a similar kind? And, as expected, a new

standard was agreed upon stating that whenever a child is transferred from another hospital, the university hospital's radiologists should conduct their own investigation of scans received from other hospitals. So the safety problem is supposedly 'settled' by the introduction of a new standard operating procedure. On the one hand, this new procedure is seemingly appropriate and has the potential to strengthen patient safety for patients in transition between healthcare sites by functioning as a useful diagnosis 'safety check'. If it comes to function as a practical rule that is thoroughly adapted to the clinical setting and internalized by clinicians, a safety check like this can work as a reminder of the uncertainty of diagnostic procedures. However, it might also have the opposite effect and therefore the idea of 'solving' the particular problem of misdiagnosis by introducing a new procedure for handover of scans between hospitals is potentially problematic. When the new procedure is added to the long list of standards, protocols and safety checks already in place, it can strengthen the feeling of certainty by supporting the ideal of a failsafe organization. The case of misdiagnosis is better than most cases able to demonstrate the uncertainty, temporality and situated status of medical knowledge—*and* to demonstrate that forgetting this, and treating diagnosis as certain, is potentially a very unsafe practice. The safety problem arises exactly because the child's diagnosis is not questioned, because it is understood as certain. When taking unpredictability and uncertainty into consideration, it can be argued that the main question posed in the aftermath of the incident should perhaps not only have been 'How are we to make sure that this is never going to happen again', but also 'How can we deal with the fact that wrong diagnoses are sometimes given?' and, given this, 'How can we create a professional environment which invites us to reflect upon diagnoses and symptoms even after treatment has started?' Such questions could help retain the focus on medical reasoning and diagnosis as situated and uncertain.

When certainty cannot be gained—as is often the case with early diagnosis—organizational systems that create the illusion of certainty can introduce new types of problems, risks and uncertainties in healthcare. In a study of safety management, Jerak-Zuiderent (2012) touches on exactly this problem by mobilizing a distinction between 'certain unsafety' and 'uncertain safety'. She analyses how present patient safety practice superimposes standardized knowledge as part of safety solutions in a way that

has potentially serious consequences for the situated judgements of what should count for safe care in concrete healthcare practices (Jerak-Zuiderent 2012: 16). In this way, the certainty with which the standardized knowledge is promoted might have unsafe consequences; it creates 'certain unsafety' while an attitude that takes into account the uncertain status of medical and safety knowledge is more likely to accommodate safety (Jerak-Zuiderent 2012).

Recent social-scientific debates about the politics of standardization in healthcare have abandoned the question of being pro or con standards. Instead, standards are studied as ambiguous, and political entities with diverse outcomes of both intended and unintended character (e.g., Berg 1997; Bowker and Star 1999; Timmermans and Berg 2003). Additionally, it has been stressed that critics of the standardization paradigm have underestimated the benefits of formalisms and standards as means of advancing healthcare practices (Timmermans and Almeling 2009). Such perspectives have initiated attempts to address standardization in a less dogmatic, more context-specific way, for instance, through concepts such as 'flexible standards' (Timmermans and Berg 2003) and 'situated standardization' (Zuiderent-Jerak 2015—see also Chap. 7). This chapter's identification of 'standardization risk' should not be taken as a critique of formalization, rules and standardization per se, which are imperative in any type of organizational work and safety management. Rather, it should be taken as a problematization of the tendency to *a priori* predetermine standardization and failsafe procedures as the obvious solution to safety issues based on a dominant logic of certainty—and as a challenge to approach standards from a pragmatic stance as practical rules that must be adopted to concrete clinical situations rather than universal and general principles of organizing based on a false sense of certainty.

Responsibility Risk: Blurring of Roles and Responsibilities

In *Rationalizing Medical Work* (1997), Marc Berg shows how 'rationalizing technologies' in healthcare causes a disciplining of medical practices to fit the specific formalisms of the technologies, with a transformation of

medical work as a consequence: 'The intriguing feature of these systems is that they alter the work that allows them to exist' (Berg 1997: 170). Introducing a safety technology, a new failsafe procedure or a safety device is not just a neutral process of adoption, but also an active transformation of the practices it meets: practices that have been internalized by the health professionals and that have often developed over a long time, through trial and error. Therefore, any introduction of patient safety technology into healthcare is likely to cause rearrangements of roles, responsibilities and earlier practices of both more formalized and invisible or informal character.

With the notion of 'responsibility risk' I attend to this type of role and responsibility redistribution and blurring caused by the introduction of safety technologies. To illustrate this problematic, another case from the university hospital can be helpful. After several incidents of undetected worsening leading to cardiac arrests, the hospital introduced a new safety arrangement: medical Emergency Teams with the goal of identifying and treating a sudden worsening and deteriorating of patients in general wards. The introduction of emergency teams, also often known as Rapid Response Teams, is an international trend (Hillman et al. 2005; Maharaj et al. 2015), which is gradually becoming the standard in Danish hospitals. The teams are centralized units consisting of emergency physicians and nurses, and their goal is to ensure safe, timely, professional and standardized emergency care to patients who are, for instance, suffering from unexpected organ failure or cardiac arrest. But while the emergency teams are introduced in order to increase the safety of patients, the practices they bring with them might become a safety issue in themselves, and I experienced during fieldwork that the introduction of emergency teams occurred occasionally as the topic for discussion in quality meetings or incident analysis sessions. From these discussions, it became obvious that the implementation and use of the emergency teams did not go as smoothly as expected. An incident of cardiac arrest in a non-intensive ward can demonstrate this point: First, and for reasons not altogether clear, the new emergency team was not called immediately when the patient stopped breathing as the procedure would have it. Rather, a phone call to an attending physician was made before the call to the team. Second, considerable confusion arose about who was in charge of

the resuscitation efforts until the team arrived. In the subsequent RCA session, one of the participants described the situation as a 'chaotic and headless operation where no one and everyone were taking charge'. Third, when the team arrived, the ward personnel were disorganized and confused about their roles and responsibilities, right down to simple questions such as whether they were supposed to stay in the room or not. Another issue concerned the documentation of the episode; as a nurse mentioned, '[i]n the old days, a cardiac arrest would immediately compel someone to grab a pen and start documenting. Now we all rush out of the room when the emergency team arrives.'

So with the introduction of emergency teams, roles and responsibility structures have changed considerably with role confusion, blurred responsibility and failure to live up to certain professional obligations (such as documentation) as a result. Before the new teams were introduced, the ward had developed a number of well-established routines and procedures (spoken as well as unspoken) for emergency situations but with the new 'safety system' new guidelines had been introduced and the implicit annulment of the 'old ways' had not been taken into account and neither had the fact that such roles, responsibilities and routines are often developed over a long period of time and that it might take a while to re-establish work practices and responsibility structures that function as effectively, swiftly and safely as the old ones (see also Holmes 2009 and Chap. 8).

The presented case of redistribution of responsibility is not specific for patient safety technology and can in many ways be said to represent what has been determined as classic problems of 'centered managerialism' (Law 2000:15), of the implementation of evidence-based knowledge or standardized systems into situated healthcare practices (see for instance Zuiderent-Jerak 2007); or of innovation when innovation is understood and conducted separately from the practices that it seeks to innovate (Mesman 2008). But there are also problems of responsibility and blurring of roles that are more specific to the programme and that attest to what could be described as patient safety's ambivalent relationship with notions such as accountability, responsibility, sanctions and blame. On the one hand, and in line with questions of addressability and accountability

raised earlier in relation to critical incident reporting, it can be argued that the transformation of clinical situations into reportable incidents—that is, the creation of new risk objects to be managed—is essentially about making actors and organizations responsible and accountable (Hilgartner 1992; Douglas 1992; Power 2007; Power et al. 2009). In line with this argument, the safety agenda's strong emphasis on risks and errors (in contrast to, for instance, danger, chance, complications and accidents) inevitably raises issues of blame and responsibility (McDonald et al. 2005). But this quest for accountability sits alongside the blame-free ethos of the programme that is designed to help realize the goal of creating a learning environment where professionals can talk openly about errors with the result that they can be reported and corrected. As I attend to in greater lengths in Chaps. 4 and 6 of this book, this blame-free principle that is supposed to increase institutional accountability and learning might well disturb traditional and situated ways of taking responsibility for and acting upon failure. Thus, blame-free patient safety technologies such as the RCA can have serious unwanted effects equally for preventing the more formal attributions of responsibility as well as more informal discussions about limits of office (see also Collins et al. 2009; Wachter and Pronovost 2009; Mengis and Nicolini 2011).

Organizing Principles in Patient Safety

The patient safety programme has not only brought safety but has simultaneously redistributed uncertainty, responsibility, tasks and focuses in ways that introduce new types of context-specific problems, risks and safety threats in clinical practice. Much of the identified risks in this chapter are not specific to patient safety, and thus the arguments are largely analytically generalizable to discussions on unwanted consequences and distributed effects of introducing rationalizing technologies, control systems, management tools or new types of knowledge or innovations into organizations and the organizational practices, routines, roles, responsibility structures and visible and invisible work that constitute such. At the same time, this chapter has strived to demonstrate that the

specific character of the patient safety programme and the particular rationalities it imposes on healthcare practices introduce risks, which are closely connected to the highly principle-based nature of the current paradigm, its strong standardization claims, its 'measure-and-manage' strategies and its blame-free ethos. These are the risks that could be determined as the self-inflicted plagues of the programme. Thus, on the basis of all four risk categories, it can be argued that the programme's specific set of ideals of, and methods for, organizing are a strong contributing factor in creating a particular kind of overarching risk: the risk of determining a set of golden principles for organizing *a priori* an analysis of the specificities of the situation (see also Du Gay and Vikkelsø 2013a, b). As we have seen in this chapter, this principle-based character of safety policy and its vision of risk elimination through standardization have certain concrete unwanted consequences for clinical practice and the organization of healthcare, as well as more intangible consequences for the possibilities of approaching safety from a pragmatic, situated and context-specific perspective, where the particularities of the clinical situation and the uncertainty of medical knowledge determine the questions to be asked and the solutions to be suggested.

Notes

1. https://en.wikipedia.org/wiki/Patient_safety_organization.

References

Allen, D., Braithwaite, J., Sandall, J., & Waring, J. (2016). Towards a sociology of healthcare safety and quality. *Sociology of Health and Illness, 38*(2), 181–197.

Berg, M. (1997). *Rationalizing medical work: Decision-support techniques and medical practices*. Cambridge, MA: MIT Press.

Bosk, C. L. (1979/2003). *Forgive and remember: Managing medical failure* (2nd ed.). Chicago: The University of Chicago Press.

Bowker, G. C., & Star, S. L. (1999). *Sorting things out: Classification and its consequences*. Cambridge, MA: MIT Press.

Bowker, G. C., Timmermans, S., & Star, S. L. (1995). Infrastructure and organizational transformation: Classifying nurses work. In W. Orlikowski, G. Walsham, M. R. Jones, & J. I. DeGross (Eds.), *Information technology and changes in organizational work* (pp. 344–370). London: Chapman and Hall.

Collins, M. E., Block, S. D., Arnold, R. M., & Christakis, N. A. (2009). On the prospects for a blame-free medical culture. *Social Science and Medicine, 69*(9), 1287–1290.

Department of Health. (2001). *Building a safer NHS for patients: Implementing an organization with a memory*. London: Department of Health.

Dodds, A., & Kodate, N. (2011). Accountability, organisational learning and risks to patient safety in England: Conflict or compromise? *Health, Risk and Society, 13*(4), 327–346.

Douglas, M. (1992). Risk and blame. In *Risk and blame: Essays in cultural theory* (pp. 3–21). London: Routledge.

Du Gay, P., & Vikkelsø, S. (2013a). Exploitation, exploration and exaltation: Notes on a metaphysical (re)turn to 'one best way of organizing'. *Research in the Sociology of Organizations, 37*, 251–281.

Du Gay, P., & Vikkelsø, S. (2013b). What makes organization? Organizational theory as a 'practical science'. In P. Adler, P. Du Gay, G. Morgan, & M. Reed (Eds.), *Oxford handbook of sociology, social theory and organization studies: Contemporary currents*. Oxford: Oxford University Press.

Hilgartner, S. (1992). The social construction of risk objects: Or, how to pry open networks of risk. In J. F. Short & L. Clarke (Eds.), *Organizations, uncertainties and risk* (pp. 39–53). Boulder, CO: Westview Press.

Hillman, K., Chen, J., Cretikos, M., et al. (2005). Introduction of the medical emergency team (MET) system: A cluster-randomized controlled trial. *Lancet, 365*, 2091–2097.

Hollnagel, E., Braithwaite, J., & Wears, R. (Eds.). (2013). *Resilient health care*. Surrey, London: Ashgate Publishing Ltd.

Hollnagel, E., Wears, R., & Braithwaite, J. (2015). *From Safety-I to Safety-II: A white paper*. The Resilient Health Care Net, Published by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia.

Holmes, S. (2009). In case of emergency: Misunderstanding tradeoffs in the war on terror. *California Law Review, 92*(2), 301–356.

Iedema, R. (2007). Critical incident reporting and the discursive reconfiguration of feeling and positioning. *Journal of Applied Linguistics, 2*(3), 343–364.

Iedema, R. (2009). New approaches to researching patient safety. *Social Science & Medicine, 69*(9), 1701–1704.

Iedema, R., Jorm, C., Braithwaite, J., et al. (2006). A root cause analysis of clinical error: Confronting the disjunction between formal rules and situated clinical activity. *Social Science and Medicine, 63*(6), 1201–1212.

Jensen, C. B. (2008). Sociology, systems and (patient) safety: Knowledge translation in healthcare policy. *Sociology of Health & Illness, 30*(2), 309–324.

Jensen, M. L., & Pedersen, K. Z. (2010). *Utilsigtede hændelser i den kommunale plejesektor*. Copenhagen: DSI.

Jerak-Zuiderent, S. (2012). Certain uncertainties: Modes of patient safety in healthcare. *Social Studies of Science, 42*(5), 732–752.

Klevens, R. M., Edwards, J. R., Richards, C. L., Jr., et al. (2007). Estimating health care-associated infections and deaths in U.S. hospitals, 2002. *Public Health Reports, 122*, 160–166.

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To err is human: Building a safer health system*. Committee on Quality of Healthcare in America, Institute of Medicine. Washington, DC: National Academy Press.

Law, J. (2000). *Ladbroke Grove: Or how to think about failing systems*. Centre for Science Studies, Lancaster University, UK. Retrieved June 29, 2013, from http://www.comp.lancs.ac.uk/sociology/papers/Law-Ladbroke-Grove-Failing-Systems.pdf

Leape, L. L. (1997). A systems analysis approach to medical error. *Journal of Evaluation in Clinical Practice, 3*(3), 213–222.

Leape, L. L. (2009). Errors in medicine. *Clinica Chimica Acta; International Journal of Clinical Chemistry, 404*(1), 2–5.

Lloyd-Bostock, S., & Hutter, B. M. (2008). Reforming regulation of the medical profession: The risks of risk-based approaches. *Health, Risk and Society, 10*(1), 69–83.

Maharaj, R., Raffaele, I., & Wendon, J. (2015). Rapid response systems: A systematic review and metanalysis. *Critical Care, 19*, 254.

McDonald, R., Waring, J., & Harrison, S. (2005). 'Balancing risk, that is my life': The politics of risk in a hospital operating theatre department. *Health, Risk & Society, 7*(4), 397–411.

Mengis, J., & Nicolini, D. (2011). Challenges to learning from clinical adverse events: A study of root cause analysis in practice. In E. Rowley & J. Waring (Eds.), *A socio-cultural perspective on patient safety* (pp. 171–188). London: Ashgate Publishing Ltd.

Mesman, J. (2008). *Uncertainty and medical innovation: Experienced pioneers in neonatal care*. Basingstoke, UK: Palgrave Macmillan.

Ministry of Interior and Health. (2011). *Vejledning om rapportering af utilsigtede hændelser i sundhedsvæsenet m.v.* Vejledning nr. 1 af 03.01.2011. Copenhagen: Indenrigs- og sundhedsministeriet.

Murphy, J., Allstetter, P., Dropp, K., Taylor, L., & Heath, C. (2009). The root cause analysis (RCA) process, one step at a time. *Topic in Patient Safety, 9*(3), 1–3.

Pedersen, K. Z. (2016). Standardization or resilience? The paradox of stability and change in patient safety. *Sociology of Health and Illness, 38*(7), 1180–1193.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.

Pirnejad, H., & Bal, R. (2011). The precarious gap between information technology and patient safety: Lessons from medication systems. In E. Rowley & J. Waring (Eds.), *A socio-cultural perspective on patient safety* (pp. 51–70). London: Ashgate Publishing Ltd.

Power, M. (2004). *The risk management of everything: Rethinking the politics of uncertainty*. London: Demos.

Power, M. (2007). *Organized uncertainty: Designing a world of risk management*. Oxford: Oxford University Press.

Power, M., Scheytt, T., Soin, K., & Sahlin, K. (2009). Reputational risk as a logic of organizing in late modernity. *Organization Studies, 30*(2/3), 301–324.

Reason, J. (1990). *Human error*. Cambridge: Cambridge University Press.

Rosenthal, M. M. (1995). *The incompetent doctor: Behind closed doors*. Philadelphia: Open University Press.

Star, S. L., & Strauss, A. (1999). Layers of silence, arenas of voice: The ecology of visible and invisible work. *Computer Supported Cooperative Work, 8*(1–2), 9–30.

Strathern, M. (Ed.). (2000a). *Audit cultures: Anthropological studies in accountability, ethics and the academy*. London: Routledge.

Strathern, M. (2000b). The tyranny of transparency. *British Educational Research Journal, 26*(3), 309–321.

The Danish Patient Safety Authority. (2016). Dansk Patientsikkerhedsdatabase Årsberetning 2015. Styrelsen for Patientsikkerhed, Copenhagen.

The Danish Patient Safety Authority. (2017). Dansk Patientsikkerhedsdatabase Årsberetning 2016. Styrelsen for Patientsikkerhed, Copenhagen.

Timmermans, S., & Almeling, R. (2009). Objectification, standardization, and commodification in healthcare: A conceptual readjustment. *Social Science & Medicine, 69*(9), 21–27.

Timmermans, S., & Berg, M. (2003). *The gold standard: The challenge of evidence-based medicine and standardization in healthcare*. Philadelphia: Temple University Press.

Timmermans, S., & Mauck, A. (2005). The promises and pitfalls of evidence-based medicine. *Health Affairs, 24*(1), 18–28.

Vikkelsø, S. (2005). Subtle redistribution of work, attention and risks: Electronic patient records and organisational consequences. *Scandinavian Journal of Information Systems, 17*(1), 3–30.

Wachter, R. M., & Pronovost, P. J. (2009). Balancing no-blame with accountability in patient safety. *New England Journal of Medicine, 361*, 1401–1406.

Waring, J. (2007). Adaptive regulation or governmentality: Patient safety and the changing regulation of medicine. *Sociology of Health & Illness, 29*(2), 163–179.

Waring, J. (2009). Constructing and re-constructing narratives of patient safety. *Social Science & Medicine, 69*(9), 1722–1731.

WHO. (2011). *Report on the burden of endemic health care-associated infection worldwide*. Geneva, Switzerland: World Health Organization.

WHO. (2016). Retrieved from http://www.euro.who.int/en/health-topics/Health-systems/patient-safety

Zuiderent-Jerak, T. (2007). Preventing implementation: Exploring interventions with standardization in healthcare. *Science as Culture, 16*(3), 311–329.

Zuiderent-Jerak, T. (2015). *Situated intervention: Sociological experiments in healthcare*. Cambridge, MA: The MIT Press.

Zuiderent-Jerak, T., & Berg, M. (2010). The sociology of quality and safety in healthcare: Studying a movement and moving sociology. In C. E. Bird, P. Conrad, A. M. Fremont, & S. Timmermans (Eds.), *The handbook of medical sociology* (6th ed., pp. 324–340). Nashville, TN: Vanderbilt University Press.

6

Learning in Patient Safety

> Imagine a jet aircraft which contains an orange coloured wire essential for its safe functioning. An airline engineer in one part of the world doing a pre-flight inspection spots that the wire is frayed in a way that suggests a critical fault rather than routine wear and tear. What would happen next? I think we know the answer. It is likely that—probably within days—most similar jet engines in the world would be inspected and the orange wire, if faulty, would be renewed. When will health-care pass the orange-wire test? (WHO 2005: 3)

One of the main buzzwords of patient safety policy is 'learning', and in the inception as well as the continuing spread of the international patient safety programme, the concept of learning is playing a vital role. Oft-used catchphrases such as 'we must start learning from our mistakes' or 'we must create a learning culture' here serve as an indictment of an unsafe healthcare system, where failures are not corrected. It is, however, a very particular understanding of learning that dominates the safety agenda. As the quote from the WHO's World Alliance for Patient Safety suggests, the goal of the international patient safety movement is illustratively to make healthcare pass 'the orange-wire test', so that by standardization, centralization and system improvement 'the bad experience suffered by a

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7_6

patient in one part of the world can be a source of transmitted learning that benefits future patients in many countries' (WHO 2005: 3). In mainstream patient safety thinking, such transmittable learning is to be founded on a learning culture in which health professionals disclose errors in order to report them to incident-reporting systems and analyse them with incident analysis tools to prevent reoccurrence. Within this particular set-up, learning essentially becomes about creating failsafe systems through transmittable and standardized system improvements.

Apart from the reference to the transferability of safety solutions, learning is also employed to establish the blame-free attitude of the patient safety programme. As learning has the immediate rhetorical advantage of generating positive and constructive associations it supports the promotion of a learning approach to safety as the opposite of a disciplinary approach where errors are traced back to individuals who are then blamed and sanctioned. With the motto of going from a blame culture to a learning culture, and from 'a person approach' to a 'system approach' (Reason 2000), the programme introduces systems learning to encourage healthcare professionals to talk openly about, report and analyse critical incidents with the goal of focusing exclusively on how 'the system' can be optimized—not who should be blamed.

Here, it is important to note that—as implied in the title of *To Err Is Human* (Kohn et al. 2000)—blaming individuals for errors is not only regarded as morally wrong within the programme but also as basically futile. This argument is based on a simplistic approach to human factors research, where errors are largely attributed to human factors such as cognitive slips, inattention and fatigue and where a general suspicion towards the learning subject is consequently prevalent: Addressing the individual learner becomes an ineffective strategy when our human cognition is essentially fallible and unmanageable. At patient safety conferences, seminars and educational events, such human shortcomings are often communicated through various 'psychological gimmicks' where the inadequacies of the mind are displayed through cognitive tests designed to illustrate the basic fallibility of humans. The participants are asked, for instance, to count the number of 'f's in a particular sentence, with the anticipated outcome that most suggest a number considerably lower than the actual sum of 'f's in the sentence. Or the participants are shown the

famous *Invisible Gorilla* experiment where they are to count the number of passes made in a basketball game after which it is revealed that—unnoticed by most—a person dressed as a gorilla went through the basketball court. By describing humans as cognitively error-prone, and by describing this condition as essentially unchangeable, the system becomes the obvious target for intervention. Or, to repeat human factors researcher and cognitive psychologist James Reason's much replicated quote, 'we cannot change the human condition but we can change the conditions humans work in' (Reason 2000: 768). Thus, 'going after the individual' in questions of safety breaches is understood equally as an immoral and ineffective strategy because humans are understood to be quite hostile to learning.

The learning agenda, then, is used equally as a precondition for, a normative justification of and a motivational factor in relation to the introduction of a systems perspective on error reduction and safety improvement in healthcare. In the remainder of this chapter, I present the systemic perspective on learning in patient safety in more detail and connect it with organizational learning theory. I then contrast this understanding with John Dewey's account of learning as inextricably linked to habits understood as stored action patterns based on earlier experience. The chapter proceeds by presenting an empirical case concerning a misdiagnosed pregnant woman and it considers what learning in and from a sentinel event entails from a systemic and a pragmatic stance respectively. The chapter ends by showing how learning involves habits and reflectivity respectively, and it connects with the discussion of the blame-free agenda by showing how banning blame can prohibit processes of learning, taking responsibility for errors and modifying habits.

Systems Learning: Patient Safety and 'Learning Organizations'

The patient safety programme's focus on systems learning is partly inspired by common organizational learning theory. Especially literature on 'the learning organisation' (e.g., Senge 1990, 1999) stresses that systems

thinking can strengthen learning in organizations. As the 'fifth discipline' of Senge's *The Fifth Discipline: The Art and Practice of the Learning Organization* (Senge 1990), systems learning is promoted as the most important method to transform organizations into learning organizations. In doing this, change management becomes dependent on certain 'skills of systems thinking':

> People start seeing and dealing with interdependencies and deeper causes of problems only as they develop the skills of systems thinking. In my experience, if basic learning capabilities like these are deficient, then they represent a fundamental limit to sustaining change. (Senge 1999: 9)

Thus, the general skill of understanding the organization as a system through learning the conceptual framework of system thinking as well as its body of knowledge and tools is praised as a way especially for managers to initiate organizational change. While the general skill of system learning is praised, the 'learning organization' perspective has a more ambivalent relationship to task-specific conduct and skills of the organizational members. Although the first of the five disciplines 'personal mastery' does include a focus on the individual 'learner', it does so only in the abstract description of a process of 'continually clarifying and deepening our personal vision, of focusing our energies, of developing patience, and of seeing reality objectively' (Senge 1999: 7). In other writings on the learning organization, a human factors approach to learning is dominant as when it is, for instance, stated that 'the source of poor performance and organisational failure is often to be found in the limited cognitive skills and capabilities of individuals compared to the complexity of the systems they are called upon to manage' (Senge and Sterman 1992: 139). Commencing with such human shortcomings, it is also a shared principle that education and training directed at improving individual and specific skills and increasing experience levels are 'weak' solutions to safety problems: 'Experience and training do not solve the problem' (Senge and Sterman 1992: 139).

The patient safety programme's systems learning approach seems to be inspired equally by human factors research, ergonomics and organizational learning theory. To investigate the specificities of this approach,

the important NHS document *An Organization with a Memory: Report of an Expert Group on Learning from Adverse Events in the NHS* (2000) becomes an obvious place to start because it has been enormously influential in promoting systems learning in healthcare. In terms of citations and effects, the document stands as the European pendant to the American Institute of Medicine's *To Err Is Human* (Kohn et al. 2000). Learning is not only central to the title of the document: In the 108-page document, learning (learn*) is mentioned nearly 300 times and in the introduction, the expert group explicates its purpose solely in relation to learning:

> Too often in the past we have witnessed tragedies which could have been avoided had the lessons of past experience been properly learned. The task of the Expert Group was to advise the Government on the steps that can be taken to ensure that the NHS learns from its experiences, so that the risk of avoidable harm to patients is minimised. (2000: vii)

In this way, learning, specifically 'learning from experience', plays a dominant rhetorical role in the document as *the* primary mechanism with the ability to make healthcare safer. In the same vein, 'failure to learn' is understood as the main cause for lack of safety. Consequently, 'failure to learn reliably from adverse events' is coupled to a wide range of alarming numbers such as an estimated 850,000 adverse events in NHS hospitals a year, of which half are understood to be avoidable and therefore subject to the 'failure to learn' argument (Department of Health 2000: 5). Within an overall logic of risk elimination, this suggests that anything understood as avoidable is also basically understood as preventable by means of safety technologies and policies.

The report is concluded with a number of suggestions as to how healthcare can 'modernise its approach to learning from failure' (Department of Health 2000: xi): namely, by reporting and analysing incidents, by promoting a blame-free learning culture and by ensuring a 'much wider appreciation of the value of the system approach in preventing, analysing and learning from errors' (Department of Health 2000: xi). These priorities can still be understood as the main bricks of the safety programme.

The phrase to 'learn from experience' is evoked as a way to express the system's ability to, within a risk elimination logic, 'learn' from errors by introducing standardized and centralized system improvements. From this perspective, experience does not seem to be related to the individual clinician's habits, skills or knowledge. Within the systems perspective, humans are, on the contrary, understood to be the weakest link as it is believed that humans are essentially more 'error-provoking' and less easy to manage than systems. Consequently, system improvements must be made to ensure that humans make as few errors as possible. Inspired by human factors research and safety engineering in other industries, the programme is thus based on

> the assumption that while we cannot change the human condition we can change the conditions under which people work so as to make them less error-provoking. When an adverse event occurs, the important issue is not who made the error but how and why did the defences fail and what factors helped to create the conditions in which the errors occurred. (Department of Health 2000: 21)

This idea about an unchangeable human condition pervades the ideology of the programme and, as a result, individual learning and training are deemed ineffective. The argument that systems are essentially more manageable than humans is reflected in arguments such as 'The local human errors are the last and probably the least manageable part of the causal sequence leading up to some adverse events' (Department of Health 2000: 21), and

> [t]he same set of circumstances can provoke similar mistakes, regardless of the people involved. Any attempt at risk management that focuses primarily upon the supposed mental processes underlying error (forgetfulness, inattention, carelessness, negligence, and the like) and does not seek out and remove these situational 'error traps' is sure to fail. (Department of Health 2000: 21)

As such, the healthcare professionals' 'mental processes' might trigger the error, but as they are assumed unmanageable and as part of 'the unchangeable human condition', one must seek to reorganize the system

in such a way that human errors become as unlikely as possible. In line with this argument, the focus on the system instead of the human as the primary 'safety guard' establishes possibilities for creating high levels of standardization and for importing solutions across departments, hospitals and even industries, with the goal of making sure that '[i]ncidents where services have failed in one part of the country are not repeated elsewhere' (Department of Health 2000: 4)—an argument similar to the orange-wire argument quoted in the very beginning of this chapter.

A number of points can be noted about the programme's systems perspective on learning. First, because it is used as an abstract systemic quality, learning becomes a rather underspecified concept in the programme's overall rhetoric. As a rhetorical concept, learning serves to legitimize the programme's intentions; it becomes a self-evident counterpart to the concept of 'blame'. Looking more specifically to what is, nonetheless, contained in the concept when analysed through the lens of the general discourse on system safety, the primary 'learning model' is to 'fix the system' by introducing standards, procedures and safety devices. Here a learning culture does not primarily attempt to make individuals or groups in the organization learn and get wiser. It is rather understood as a culture where individuals report and analyse incidents to make the *system* wiser. As a result, the safety programme's understanding of learning undermines the importance of approaching 'the learner' and his or her context and task-specific habits, experiences and skills, and speaks almost solely about the system's ability to learn. The interesting consequence of the programme's logic is that it is eventually only humans, not systems, who are understood as inherently fallible and consequently the goal is to create systems that are as independent of experience, memory and individual habits as possible.

An important question, which the patient safety literature is remarkably silent about, is the relationship between systems learning and the individual healthcare professional. What does learning become for the individual health professional (or the group) in a perspective where everything is about the system's ability to learn and adapt? In the literature on the learning organization, individual learning becomes a matter of learning how to think, talk and act in accordance with the systems perspective. Hence, healthcare professionals are to be taught how to identify, report

and analyse critical incidents, as well as how to talk in specific systemic and blame-free terms about errors (now spoken of as adverse events or critical incidents). Moreover, the persona of the health professional has a part to play in securing the implementation of systems learning by, for instance, following guidelines and adhering to new standards in order to reduce the system's dependence upon 'the human condition' and its basic variability. Learning, in this way, is linked exclusively to learning the 'discipline of patient safety' and, as described in the WHO patient safety research online cause, the level of learning in the healthcare system can be evaluated by the 'presence of policy or program', the 'staff knowledge of policy or program' or the 'appropriate use of policy or program' (WHO 2016—see also Chap. 5 on second-order risk).

In this way, what Bente Elkjaer claims for theories on the learning organization can simultaneously be claimed for mainstream patient safety literature: namely, that when individual learning *is* addressed, it is often treated in rather unspecific and unproblematic terms and 'the relation between individual learning and organisational problem solving is regarded as unproblematic, construed simply as a matter of the former meeting the demands of the latter' (Elkjaer 2001: 439). In order to make up for this lack of understanding of learning on an individual or group level, John Dewey is an obvious source to turn to.

To Know with the Muscles: Dewey's Approach to Learning

> A certain delicate combination of habit and impulse is requisite for observation, memory and judgment. Knowledge which is not projected against the black unknown lives in the muscles, not in consciousness. We may, indeed, be said to *know how* by means of our habits. (Dewey 1922: 177)

John Dewey's work springs from an overriding interest in learning, education and questions of how we can guide our actions from inquiring into our experiences and refining our habits accordingly. The close connection Dewey draws between learning and experience is popularly known as 'learning by doing', although Dewey's own term is 'learning

from experience' (Dewey 1916: 140). Essentially, Dewey states that learning and education are matters of examining and reflecting upon experience and its value in problematic situations, i.e., uncertain situations which require us to reflect, think and find a solution to the specific problem that confronts us. Patterns of such thinking and inquiring are built on previous experience in solving similar types of problems and, as such, experience and inquiry into experience enables us to act in a more informed way. From this follows, on the one hand, that a learning environment is a reflective environment, which encourages experience-based and context-specific thinking and inquiring. The importance of reflection for learning in Dewey's writings is well known, has been studied thoroughly and has inspired organizational learning theories (Boud et al. 1985; Elkjaer 2001; Jordan et al. 2009; Schön 1983, 1987).

On the other hand, and what is less recognized within the common Dewey reception, learning is also intrinsically connected to and dependent on habit, intuition and feeling, which explains why one of Dewey's most significant works, *Human Nature and Conduct* (1922), is dedicated to exactly these dispositions. Here he defines habit as

> the kind of human activity which is influenced by prior activity and is in that sense acquired; which contains within itself a certain ordering or systematization of minor elements of action; which is projective, dynamic in quality, ready for overt manifestation; and which is operative in some subdued form even when not obviously dominating activity. (Dewey 1922: 42)

Dewey goes as far as to establish that 'man is a creature of habits' (Dewey 1922: 18). To illustrate the importance of habit for learning, Dewey asks what it requires for a man to stand straight, and he argues against the belief that 'if one is told what to do, if the right *end* is pointed to them, all that is required in order to bring about the right act is will or wish on the part of the one who is to act' (Dewey 1922: 27). Rather, standing straight is about the formation of the habit of standing straight, it is about learning to stand straight, not wishing to do so. This leads Dewey to conclude that only one who already knows how to, that is, who has a habit of standing straight, is able to perform the act: 'a man who *can*

stand properly does so and only a man who can, does' (Dewey 1922: 29). It is in line with this argument that Dewey states that 'the act must come before the thought' (Dewey 1922: 30). This should not, however, be taken literally as a suggestion to act first and think afterwards, a principle which is promoted in certain parts of organization theory. Particularly, organizational theorist Karl Weick has endorsed the argument that in uncertain situations one should not put one's faith in past experiences. Therefore, when faced with uncertainty, a strategy cannot be rationally thought out, but should come about as a spontaneous intervention that can be rationalized only in retrospect (e.g., Weick 2001, 2007). Dewey, who was a firm believer in 'intelligent inquiry into the means which will produce the desired result' (Dewey 1922: 28), especially when faced with uncertainty, is hinting at something quite different. Namely, the importance of habits and acquired skills built through past experiences and careful training for our ability to think and inquire systematically into the situation at hand. Hence, to state that the act comes before the thought is not to say that we must act first and think afterwards, but rather that we only know how to think, inquire into and pose judgement on the specificities of the situation because of previous context-specific experience in doing so; that is, because of 'intelligently controlled habit' (Dewey 1922: 28). It is in this way that we can be said to '*know how* by means of our habits' (Dewey 1922: 177).

From this perspective it does not make sense to divide humans into a body with senses and a mind with ideas as such are intimately connected in all our acts. This argument is already present in Dewey's early and famous 'The Reflex Arc Concept in Psychology' (1896), where he shows how sensing as well as thinking are consequences of earlier experiences, inquiry, training and well-developed habits. Even what is often understood as an automatic reflex, when for instance a child reaches for a light, is actually an acquired habit—or *coordination* as Dewey prefers in his early work—built on earlier experiences of successful courses of action. The more often we experience a successful result by following a certain course of action (seeing and grasping for instance), the more 'unquestioned' or automatic our disposition to follow this course of action becomes. Therefore Dewey maintains in *Human Nature and Conduct*,

that to have a sensation in the first place is the product of 'a highly skilled analysis' based on previous training and well-formed habits (1922: 31). In this way, a habit comes before any sensation and consequently we cannot discount intuitions and impulses as something merely instinctive: 'Immediate, seemingly instinctive, feeling of the direction and end of various lines of behaviour is in reality the feeling of habits working below direct consciousness' (Dewey 1922: 32).

Thinking, to Dewey, is also based on habit. 'The formation of ideas as well as their execution depends upon habit' (1922: 30) he argues, and thereby emphasizes that thinking and inquiring are based on dispositions that need to be learned, trained and maintained. The quote 'learning is learning to think' (Dewey 1933: 176) therefore reminds us that thinking and learning from our experiences does not come to us on a silver platter, but have to be formed. At the same time, the acknowledgement that 'concrete habits are the means of knowledge and thought' (Dewey 1922: 176) also implies that, while all habits are situated, there is no such thing as a universal kind of knowledge. A painter, a sailor, a scientist or a physician have acquired different habits through their specific past experiences, training, practical skills and interaction with their environment. Hence, when Dewey states that '[t]he scientific man and the philosopher like the carpenter, the physician and politician know with their habits not with their consciousness' (Dewey 1922: 182), it is to say that knowledge is always context-, task- and role-specific, built on concrete past experiences and situated in a particular environment. This is an argument against the idea that knowledge and learning can be universalized and formalized to fit all situations independently of context: It is an argument against the idea that '[b]ecause a thirsty man gets satisfaction in drinking water, bliss consists in being drowned' (Dewey 1922: 175).

Finally, it should be mentioned that Dewey divides habits into two kinds: 'The real opposition is not between reason and habit but between routine, unintelligent habit, and intelligent habit or art' (Dewey 1922: 77). The first kind of habits he describes as 'mechanical exercises of repetition in which skill apart from thought is the aim' (Dewey 1922: 71). He frequently refers to this kind of habit as routine, but also as unintelligent, unthinking, dead or mechanical habit, or just as 'absentmindedness'

(Dewey 1922: 173). Although Dewey is aware that mechanization of habit is of vital importance for human existence, he states that '[r]epetition is in no way the essence of habit' (Dewey 1922: 42). The second kind of habit, in contrast, shapes our ability to think, inquire, judge and learn. Referred to as intelligent, artistic or 'reflective and meditative' (Dewey 1922: 209), this kind of habit is not (only) built on mindless repetition but springs from previous reflective thinking, inquiring and judging in such a way that it becomes 'an ability, an art, formed through past experience' (Dewey 1922: 66). This kind of intelligent habit can be described as 'an acquired predisposition to *ways* or modes of response, not to particular acts' (Dewey 1922: 42). From a more normative perspective, learning from experience is then essentially about developing certain types of predispositions and the 'fostering of those habits and impulses which lead to a broad, just, sympathetic survey of situations' (Dewey 1922: 207).

The Case of a Misdiagnosed Extrauterine Pregnancy

Although the use of root cause analysis (RCA) has been increasingly criticized in recent years, especially within the new resilience or Safety II perspective on patient safety (Hollnagel et al. 2013, 2015), the model is one of the most central 'learning tools' within the patient safety programme. As described earlier, the overall goal of the RCA is to provide an analysis of the sentinel event in question in order to identify a number of system improvements, which—when implemented—can ideally prevent similar incidents from occurring in the future. In other words, the goal of the RCA is to generate systems learning from particular incidents. The RCA meetings follow a standardized script, are led by professionally trained patient safety advocates, often a risk manager and involve the implicated health professionals. In what follows I turn to an RCA from my hospital study, which can help set the scene for a discussion of tensions between the programme's systemic approach to learning and the Deweyian approach to learning.

This particular RCA is conducted in the aftermath of a sentinel event concerning a pregnant woman that can be summarized as follows: The

woman is hospitalized as she is in great pain. When she is admitted, a scan is conducted and the foetus is established to be lifeless. The woman is estimated to be 18 weeks pregnant and is diagnosed as experiencing a spontaneous abortion caused by a so-called placental abruption: a condition where the placenta is increasingly separated from the uterus. The patient is—according to standard procedure—given medication to speed up the abortion, but during the next hours, her condition rapidly worsens, the abortion does not take place and, consequently, the nurses on the ward start to worry about her condition. However, the attending physician in charge the night she is admitted upholds the initial diagnosis, and so does the attending physician taking over on the following day up until the woman experiences a cardiac arrest. Only now it is realized that she is suffering from a ruptured and therefore internally bleeding extrauterine pregnancy—a dangerous condition where the foetus is growing outside of the uterus. Luckily, the woman is resurrected and survives.

During the subsequent RCA process, which stretched for more than five hours over two meetings, the investigation team quickly agrees that the main question to be answered is why the wrong diagnosis was withheld. To answer this question, a number of causes are explicated during the process. Most importantly, it seems that significant pieces of information available at the time pointed in the direction of the given diagnosis. As one of the attending physicians states, '[t]he reason it goes wrong in this case is that you think that things are just as they seem, however, it turned out, they are not'. A number of preceding events can explain why the attending physicians were left to believe that 'things are just as they seem': that the pregnancy was normal and hence intrauterine. In particular, what is thought at the time to be no less than three previous scans had not led them to believe that the pregnancy was anything but intrauterine: First, a conversation with the foreign-speaking husband gives the impression that the woman had her regular week-14 scan where everything looked normal. This information is later doubted. Second, before her hospitalization, the woman received a week-20 anomaly scan; however, the pregnancy at this point is estimated to be less than 20 weeks because of the small size of the foetus, and so the scan is never fully completed and the abnormality is not detected. Although the scan is interrupted, the couple is led to believe that the pregnancy is normal. Third, as

described, a scan is conducted when the woman is hospitalized, but as the woman is in a lot of pain, the scan is quick and chaotic and hence inadequate to establish the extrauterine pregnancy. Had just one of these scans been thoroughly completed, an extrauterine pregnancy would without much doubt have been established.

In addition to the weighty argument of the 3 scans, other reasons for withholding the misdiagnosis are pointed out during the meetings: For instance, the involved physicians state that it is extremely rare that an extrauterine pregnancy can continue for so many weeks without any symptoms: 'It is rarely in our heads that this is a possibility,' one of the implicated explains. Moreover, the given diagnosis, placental abruption, can potentially be very painful and therefore the woman's symptoms did not—at first sight at least—contradict the initial diagnosis. So 'on paper' (as far as the attending physicians were concerned at the time), a long list of reasons were reassuring them that the diagnosis was correct. With Paget's definition of the mistake as an action going wrong (Paget, 1988), they were at the time led on by a number of clues, standard behaviour and what is normally understood as evidence in cases like this with the result that their action (the diagnosis) was kept on what should turn out to be the wrong track.

Sitting in on the RCA meetings and experiencing the uneasy atmosphere and almost constant tension in the room, it was obvious that something else was also at stake that was not so easily approached by the implicated health professionals. Because, although the diagnosis and treatment decision looked fine on paper, a number of the involved personnel felt and suspected that something was not 'as it seemed'. As one of the attending physicians explains:

> At some point in the morning somebody had a suspicion [that it could be an extrauterine pregnancy], however, it then became highly misleading that a fresh scan from ultrasound was available. The suspicion was not big enough for us to get a second opinion.

The same physician who was in charge on the night she was admitted was obviously worried about the state of the woman. During the RCA sessions, he struggles to find the right terms to describe this unease,

but when directly confronted with a nurse's suggestion that she had 'a feeling' that he was worried about the patient's condition, although he did not directly tell her so, he describes the case as follows: 'It was one of those cases where you experience a certain unease. I had a feeling that she was unstable. It is something non-verbal. I went around looking worried with wrinkles in my forehead.' Apart from the attending physician, the nurses working closest to the patient were most uncomfortable with the situation. The nurse who was in charge of the patient explained: 'It is not my responsibility to diagnose the patient, but something did not add up. It did not fit my intuition at all. At times, she was totally gone, at others she was screaming from pain.' Accordingly, the nurse tried to indicate to the second attending physician (working the day shift) that something was not adding up. This physician did not, however, react to this warning, as he was, in his own words, 'slightly unsure about her unstable condition but nor unsure about her diagnosis'. Some of the issues here, it seems, were about hierarchy and about the nature of the knowledge the nurses tried to communicate. Several studies on nursing have found that while nurses often work closest to the patients, and are therefore often in the best position to sense potential problems, irregularities or vulnerable situations, their knowledge is also difficult to communicate because of its predominantly intuitive nature (see, for instance, Green 2012; Benner and Tanner 1987; Rew and Barron 1987).

Closing Safety Gaps

Following the logic of the patient safety programme and its ideal of transmitted learning through standardization, the case of the misdiagnosed pregnancy is a classic example of how failure originates from a number of safety gaps, which need to be 'closed' or corrected in order to prevent similar incidents in the future. The risk manager in the concrete RCA process announces during the first session that 'this is one of those cases where all the holes in the cheese slide align while blinking bright red, so what we need to do now is to close these holes'. This is, of course, a specific reference to James Reason's epitomic illustration of the healthcare system as a Swiss cheese (1990, 1997; see Chap. 3). From a 'Swiss cheese'

perspective, the RCA is understood as a way to introduce system improvements targeted at closing the discovered 'holes in the safety net', which ideally will help prevent similar incidents in the future. When the circle is completed, it is assumed that the system has *learned* from the incident. In the present case, the established root cause of the accident, the retention of the wrong diagnosis, was to be managed by the introduction of three concrete action plans developed during the RCA sessions: First, the introduction of a new standard for scans to always secure a full week-20 abnormality scan, including those cases where the foetus is estimated to be younger (i.e., smaller than usual). Second, a new guideline for handing over information about patients during the changeover between shifts. This plan is suggested as a way to evade the specific problem that is addressed during the RCA meeting concerning lack of communication about the state of the woman between the health professionals working the night and day shift. And third, a 'timeout' in relation to the handling of acutely ill patients. This new procedure is supposed to involve both nurses and physicians and is presented as a solution to what is determined as the 'communication problems' between the two professions linked especially to the fact that the nurses did try to communicate their worries about the patient's condition while the attending physicians did not react to this. In line with the principles of the programme, this identification of standardization-based solutions is how 'learning from experience', to refer back to *An Organization with a Memory* (Department of Health 2000), is enacted. Yet, it must be noted that it is only the first action plan concerning a new scan procedure that fully lives up to the ideal of prevention through transmitted learning. Judged by its ability to pass the 'orange-wire test' of the WHO quote in the beginning of this chapter, this action plan is just after the book; it is fully standardizable, transmittable across contexts and readily implementable. The two other plans concerning 'knowledge-sharing' and 'timeouts' are judged by the programme to be less ideal standardization solutions, as they do not rule out variation and are still reliant on the healthcare professionals' communication skills and discretionary abilities.

While the incident with the misdiagnosed pregnant woman is easily ticked off as a classic 'Swiss cheese' case of aligning safety gaps, it can also

function as an example of the limits of this approach. It is obvious that neither my short description of the case nor the results of the RCA are doing the complex situation justice in terms of the various details which led to the incident and the list of questions it poses. Apart from the circumstances that lead the physicians to believe that the initial diagnosis was correct, a long list of mitigating circumstances must be added concerning workload and resources, staff shortage, communication problems, logistics, hierarchy, responsibility, a lack of skill in handling acute patients at this particular non-intensive ward and even perhaps questions of malpractice (I return to this question at the end of the chapter). The complex set-up of circumstances is, however, also often the reality of the everyday practice of medicine, and in this specific situation, a very large number of different circumstances interplayed in very unfortunate ways. As attested so convincingly by Charles Perrow (1984), the notion of creating safety by closing safety gaps and eliminating the possibility for error by standardization is challenging because it presupposes stability and predictability. However, the likelihood of a similar incident, in this case an incident including no less than three failed scans, a foreign-speaking husband, a lack of physicians on that particular day and so on and so forth, is quite close to none.

When 'Muscle Knowledge' Is Overruled

As laid out, a Deweyian stance on learning highlights the importance of slowly developed habits based on past experience for the possibility of inquiring into problematic situations. Looking at the incident with a Deweyian attitude that focuses on habits, intuitions, experiences and the possibility of inquiry, one must turn to the part of the story that is not officially reported in the RCA report. The uneasiness described by the healthcare professionals during the episode leading up to the cardiac arrest, the intuition that something did not add up although all formal knowledge would have it otherwise, could be described, I suggest, as exactly the 'delicate combination of habit and impulse' (1922: 177), from which inquiry, thought and learning springs forth, according to Dewey.

Because of earlier experiences with similar situations, that is, because of the healthcare professionals' skills and training in dealing with specific patients and illnesses, they 'knew with their muscles', as it were, that something was not right. While some, especially the nurses, communicated their unsettlement, it was for others not expressed verbally but only, as described, through uneasiness and 'wrinkles in the forehead'. So in verbal and non-verbal forms, the experience of unsettledness and tensions, which to Dewey is the precondition for inquiry, was strongly present in the situation. However, for a multitude of reasons, the unsettled situation was never treated as a problematic situation where a problem is instituted and a solution called for. With one of the physician's words, the various hunches never got their 'second opinions', and a new and situationally adjusted judgement of diagnosis based on the experiences and skills of the healthcare professionals as well as the available facts were, consequently, not enacted. From a Deweyian perspective, this is the main dilemma of the case.

With Dewey, then, 'learning from experience' becomes something more than the ability to create systemic improvements based on the identification of root causes. Instead, when viewing the learning objects not only as 'the system' but equally as the humans in it, learning becomes central to grasping the main problematic of the case: namely, that 'learning from experience' was *not* enacted, although experience was there to be learned from. Hence, understanding learning as a situated, embedded practice involving body as well as mind, person as well as system, forces us to approach learning not only as what is taken from the situation but jointly as what is enacted in the situation. As such, the case shows just how important, albeit extremely delicate, task-specific 'muscle knowledge' is for detecting, acknowledging and learning about errors or safety-critical incidents in concrete clinical situations. More specifically, the case shows that intuitions, feelings, habits and tacit knowledge founded on previous experience of and training in similar situations are easily overruled by formal knowledge, busyness, communication problems, systems failures or other types of entanglements in the complex arrangement of everyday clinical practice.

The importance of 'muscle knowledge' for learning in the situation constitutes a specific type of safety issue, which in many ways is counter

to the logic of the present safety programme and the type of problems it encounters. Accordingly, the problem is not fallible, variable, cognitively insufficient humans from which patients must be protected via failsafe systems. Rather, this case represents a highly fallible system in which task-specific skills, competences, habits and bodily knowledge can play an important part in maintaining and keeping it safe (see also Mesman 2008, 2009; Beguin 2009).

As indicated, the importance of healthcare workers' intuitions is not unheard of within patient safety policy. And in the case of the misdiagnosed pregnancy, one of the action plans did, as described, involve the establishment of a timeout in relation to acutely ill patients as a way to create spaces for reflection and expression of doubt. Timeouts are well known within safety engineering, for instance as parts of surgical checklists (WHO 2008), and so is the more general idea of establishing spaces of reflexivity in certain parts of care delivery processes (e.g., Iedema and Carroll 2011; Zuiderent-Jerak 2015). One can only assume that such solutions are likely to have successful safety outcomes if they are appropriately introduced into, adjusted to and slowly integrated into clinical practice. The difference, however, between a Deweyian and a systemic approach to such arrangements is that to Dewey intuitions, hunches, experiences and slowly developed habits are not only something to be counted on in predetermined flexible spaces or in cases where system barriers break down. Rather, they are the precondition for delivering safe care all the time (see also Chap. 7). I therefore suggest that a more fruitful way of addressing the questions posed by the case of the misdiagnosis can be derived from Dewey's approach to learning as presented in this chapter.

Learning as Fostering Safety Dispositions

A Deweyian stance on learning addresses the tacit, habitual, bodily and experience-based intuitions, feelings and knowledge of the healthcare professionals, not only as emergency signals to warn about systems failure, but as the backbone of safe practices in healthcare. Safety is something that needs to be drilled into the healthcare professionals by training

and careful work on the self. Following Dewey, intelligent and mindful habits and routines are built from experiences of previous reflective thought and inquiry, and it is only such experiences that foster the predisposition to act in certain ways instead of just repeating certain acts. By adopting this framework in issues of patient safety, archiving safety is not only about safety procedures, systemic improvements or the creation of reflective spaces, but equally about the ability to foster a certain attitude or predisposition towards safety, which prompts healthcare professionals to develop and act in accordance with their 'intelligent habits', to react on impulses based on these habits, to inquire into uncertain situations and to learn from their experiences. Safety then essentially becomes about learning: It becomes about developing safety dispositions and attitudes through a constant refinement of habits and, as such, it becomes about obtaining 'muscle-knowledge'. And this is not something that comes easy. Fostering habits and dispositions takes exercise, development of skills, the slow accumulation of experiences and, not least, training in reacting to impulses, feelings and bodily knowledge.

Understanding learning in relation to healthcare professionals' development of safety dispositions, as an alternative to understanding it in relation to advancing systems safety via standardization has consequences for how one might approach safety management. At this point, it is not unlikely that inspiration can spring from looking to what already constitutes the safety work done at the clinical level, some of which runs parallel with, or even counter to, the requirements of the safety programme. To give an example, during my fieldwork, I met patient safety representatives who had taken it upon themselves to instil thoughts and reflectivity into routines by asking 'why' as much as possible to their colleagues:

> The proactive part of the job [as patient safety representative] is the most rewarding. And often they [your colleagues] may well have the answers themselves. For instance, when flushing a catheter, are you to flush it with sterile water or saltwater? To name a small thing. Well, try to think for yourself. This was also the way I learned best, when I was a student. Whenever people came and asked: 'why are you doing it like that? Or what do you think? What samples do you need to take, when you enter a patient with this or that condition? What do you think?' All of a sudden you have

> to think for yourself. And this is also what is dangerous about this patient safety thing. We can make these safe boxes. Thought-free institution. Everything is well thought out for you. But this might deprive people of their own thinking and then there will also be errors. So it's always a balance.

Although this quote can be seen as reflecting a classic discussion about standardization versus autonomy or discretion, it can also, with Dewey's insistence on the importance of distinguishing between intelligent and unintelligent habit, be taken as a discussion about how to establish habits (or routines) in the best way possible. The simple trick of asking 'why' and forcing health professionals to reflect on their habits and routines or the procedures they attend to here exactly becomes a question of educating them to acquire dispositions towards safety by fostering certain '*ways* or modes of response' (Dewey 1922: 42), as opposed to an understanding of safety as mere repetition (and standardization) of specific acts.

Learning as Habit *and* Reflectivity

The abstract, cognitive and systemic understanding of learning found in the patient safety programme as well as in Peter Senge and colleagues' model on the learning organization (as described in the beginning of this chapter) has been criticized by promoters of more practice-based theories on learning and knowing (e.g., Fox 2000; Gherardi 2000; Lave and Wenger 1991; Wenger 1998). One of the most influential of these perspectives, situated learning theory, was proposed by Lave and Wenger (1991) as a way to address learning as a contextual and social process taking place in so-called communities of practice. Participation is the anchor point of Lave and Wenger's theory, and, as such, they identify learning as participation in a network of relations. In important ways, Dewey's concept of learning can supplement these otherwise significant theories.

Dewey's account on learning has a concreteness and practicality that many other learning theories lack. According to Bente Elkjaer, situated learning theory operates on an abstract level, and therefore it answers

neither the question of method nor the question of content in relation to learning. Here, Dewey can assist, Elkjaer argues, as he 'answers to the 'how' of learning (through the use of inquiry) and the 'what' of learning (by developing reflective experiences)' (Elkjaer 2001: 440). However, by only highlighting these two notions—inquiry and reflective experience—Elkjaer joins the common Dewey reception, where learning is primarily understood in relation to its explicitly reflective elements. Yet, as we have seen, there is more to Dewey than reflectivity. By bringing habits, intuition and the body to the centre of learning and knowledge production, he supplements the vast majority of practice-based learning theories, which have been said to pay 'more attention to *social* relations, interactions, and discourses, and less to *bodily* practices' (Yakhlef 2010: 409).

Within sociology Dewey is not the only one who can make up for this 'relative neglect of embodiment' (Yakhlef 2010: 413). Thus, a number of influential sources have delivered more corporal perspectives on learning and knowing, explicitly focusing on dispositions, habits and intuitions (e.g., Bourdieu 1977; Mauss 1934; Merleau-Ponty 1962). While being perhaps the less appreciated of these, Marcel Mauss argues in his 'Techniques of the Body' (1934) for a strong link between habits, the development of bodily skills and learning. Mauss describes a wide range of bodily techniques including eating, washing, sitting and swimming. Such techniques are culturally specific, explicitly adapted to the situation and should be understood as dispositions that must be drilled into the individual through training. One of the numerous examples from Mauss's text concerns the technique of digging. During World War I, the English troops had gotten hold of 8000 French spades but they turned out to be useless as the English soldiers did not have training in digging with them. This indicates, Mauss argues, 'that a manual knack can only be learnt slowly. Every technique properly so-called has its own form' (Mauss 1934: 71). As such, Mauss is interested in 'the shaping of the body through the mastery of specific assemblages of action, stored and transmitted in particular social organizations and relationships' (Hunter and Saunder 1995: 71). This understanding of learning in connection to context-specific and slowly developed techniques is not far from Dewey's focus on the importance of habits for learning, illustrated by, for instance,

his earlier described account of what it takes for a man to stand straight (1922). But where there is seemingly no relationship between the habitual and bodily, on the one hand, and the reflective and cognitive, on the other, in Mauss's approach, Dewey's stance on learning offers a way out of this dilemma. By explicating that intelligent habits are often based on previous reflective thought and inquiry, Dewey opens up a possibility of connecting the prereflective and the reflective. As such, Dewey will simultaneously agree that '[l]earning is corporal, pre-discursive and pre-social, streaming from the body's perpetual need to cope with tensions arising in the body-environment connections' (Yakhlef 2010: 409) and insist that the way to know how specifically to cope with such tensions rests on experiences and habits that are often gained through previous reflective inquiry.

The Deweyian understanding of learning as the development of experience-based dispositions based on inquiry also has consequences for how we approach the learning process that goes on in the aftermath of medical error. From a pragmatic stance, retrospective error analysis such as the RCA is to support the development or modification of habits and this process is inseparably connected to processes of taking responsibility for errors in order to commit to learning and the inculcation of new ways of response. In the last part of the chapter, I discuss the RCA process of the case of the pregnant woman and argue that important learning opportunities were disrupted because of the blame-free perspective of the methodology.

Learning by Taking Responsibility

The case of the misdiagnosed pregnancy in this chapter can, in Dewey's terms, be understood as an 'unsettled situation' that never turned into a 'problematic' one, as the healthcare professionals' experience-based habits and intuitions were, unfortunately and for several reasons, not at the time taken as an occasion to inquire further into the tensions and inconsistencies of the particular clinical situation. An obvious question to ask now is whether the RCA sessions, which within the safety programme's optic are the epicentre of learning from incidents, created a second possibility for

making up for this lack of initial inquiry and problem solving. Did the sessions, with Dewey, function in a way to turn an unsettled and problematic situation into a settled one in order to create experienced-based learning from the situation? As already indicated, and judged from the feeling of unsettlement and unrealized tensions at the meetings, the answer to this is 'no': The problematic situation was not resolved. Although there might be various reasons for this, it is evident that a crucial reason was that as a blame-free tool the RCA only intended to address systemic causes and solutions. Therefore, to round of the discussion of the case of the misdiagnosed pregnant woman, we now need to return to the theme of Chap. 4: The challenges of current patient safety efforts to address issues of professional responsibility and mechanisms of approval and disapproval, also, or perhaps especially, as an important element of learning. In the concrete RCA, the blame-free ethos was maintained by the risk manager, who several times during the sessions reminded the participants 'Now remember, that this is a blame-free session'. In this, as in other RCAs I attended, such appeals to a blame-free environment seemed to be most eagerly given when problems of blame and responsibility were at stake. In this particular case, the atmosphere in the room was exceptionally tense and these unresolved tensions were, I believe, physically felt by everyone involved.

The main tension concerned an oppressed conflict between the attending physician working the day shift and the nurses who attended to the patient and who tried to warn the physician of the patient's grave condition. The attending physician had good reasons for withholding the diagnosis, including, as described, no less than three scans. He could also point to other contributing factors such as staffing shortage, which had made him responsible for an extra ward of patients. The nurses, on their side, argued that they had tried to warn the physician that something did not add up; and at the RCA meetings they expressed clear frustration that their possibly somewhat vague, but persistent, warnings were disregarded.

Several questions could be asked regarding the appropriateness of using a 'blame-free' strategy in order to address these tensions. First, there is a question of hierarchical relations. No matter how excusable because of systemic failures, business and other mitigating circumstances, the formal

responsibility of the pregnant woman and her health lies in the hands of the attending physicians. Here we should recall Charles Bosk's description of the 1970s US surgeons' equivalent to the RCA, the Mortality and Morbidity Conferences, where attendings 'put on the hair shirt' by showing regret and taking full responsibility for mistakes and shortcomings in mortality cases—even when they were not themselves directly implicated and when 'systemic' excuses could be made (see Chap. 4). Hereby, Bosk argues, the attendings actively encourage disclosure of error, they teach their subordinates that failures are an inescapable part of professional life and they simultaneously show them 'the proper expression of guilt' (Bosk 2003: 144). This relation between the attending and his or her subordinates is the condition for the transfer not only of medical knowledge but also of ethical attitudes. In these formalized conferences, then, learning, disclosure, acknowledgement of mitigating circumstances and taking responsibility and expressing guilt and self-blame go hand in hand.

In the RCA process, the opposite scenario takes place. Not only is the attending physician working the day shift not 'putting on his hair shirt', he actively renounces responsibility, makes excuses and indirectly blames the nurses and other health professionals for the incident. And this, I believe, is the real reason for the tense atmosphere in the room: not the incident in itself, but the refusal to take responsibility for the incident. In Bosk's study, such refusal would be determined as a normative error committed by the attending physician and involving a failure to 'discharge his role obligations conscientiously' (Bosk 2003: 51), a failure to show how seriously he takes his responsibility to the patients and—most importantly—a failure to show his willingness to improve, to learn from the incident.

Apart from the question of formal responsibility, the case of the pregnant woman raises another question of responsibility, obligations and learning related to the two attending physicians' lack of attention to their own or others' intuitions and hunches that something did not add up. The physician who worked the night shift walked around with 'wrinkles in his forehead' but did not react on this feeling of unease. And the attending physician who took over the next day gave no attention to the nurses' feeling of worry for the woman. Had the RCA not been so focused on determining standardizable solutions, it could have discussed the obligations of health professionals to react on their hunches and inquire into

the situation when their experience and critical sense tell them that something is wrong. Taking responsibility for the incident—not only individually but also as a group—could help the health professionals inculcate this obligation so that the next time, they would react on their own intuitions and critical sense, or listen seriously to others.

What is important, then, is to point out that because of the blame-free ethos of the RCA sessions neither of these two questions of responsibility was ever attended to. The blame-free systems perspective did not leave room for the subtle internal routines of co-collegial error detection, error definition and error management, which earlier studies of medical practice have described as requisite for taking responsibility, forgiving, blaming or being remorseful in relation to medical error. Thereby it also decreases the possibility for the implicated to learn from the incident.

That responsibility, blame, remorse and disapproval are not antithetical to learning converges with Dewey's notion of habits as presented earlier in the chapter. To Dewey the importance of blaming is not contained in the idea of pointing fingers or in the attribution of causes or intentions to actions. Rather, blaming, condemning, praising and forgiving are all inseparable parts of learning, of changing one's habits in order to change one's future conduct. It is essentially a question of moral education.

> Courses of action which put the blame exclusively on a person as if his evil will were the sole cause of wrong-doing and those which condone offense on account of the share of social conditions in producing bad disposition, are equally ways of making an unreal separation of man from his surroundings, mind from the world. Causes for an act always exist, but causes are not excuses. Questions of causation are physical, not moral except when they concern future consequences. It is as causes of future actions that excuses and accusations alike must be considered. (Dewey 1922: 18)

Thus, Dewey insists that blame and praise are useful and necessary, not to establish causes of action, but in order to affect future actions by installing learning. This is similar to what Marianne Paget insisted in her study on medical error: namely that moral disapprobation of mistakes and misconduct is necessary in order to correct conduct in the future. It is necessary to make health professionals learn by experience so that the

next time, in a similar situation, they will act differently (Paget 1988: 131).

On the one hand, then, we must understand that actions are always a product of 'social partnership' and that we can therefore not rely on what Dewey describes as 'a belief in metaphysical free-will' (Dewey 1922: 18). But, on the other hand, in order to prevent bad outcomes in the future, we do need to attend to 'excuses and accusations'—i.e., to make moral judgements—in order to stimulate learning:

> The moral problem is that of modifying the factors which now influence future results. To change the working character or will of another we have to alter objective conditions which enter into his habits. Our own schemes of judgment, of assigning blame and praise, of awarding punishment and honor, are part of these conditions. (Dewey 1922: 19)

Accordingly, morals and learning are inseparable in Dewey's thinking. When we ascribe responsibility or express blame or forgiveness, it is with the purpose of changing a person's habits and making him or her learn how to act in the future. From this perspective, the tensions and uneasiness felt at the RCA meetings should have been dealt with in the name of learning. Not to establish more root causes, or suggest new standards and system optimizations, but to approach questions of professional responsibilities related to formal roles and office-holding as well as to the obligation to listen and react to more bodily and experience-based kinds of knowledge. The purpose of addressing these questions would not be to attribute intensions to actions but rather to hold clinicians and clinical teams accountable and install the case as a learning experience so that they are more likely to act 'differently *next* time' (Dewey 1932: 304; see also Chap. 9).

Although the RCA investigation group settled on a description of the incident and a list of action plans, the lack of attention to responsibility had the effect that the tension remained unreleased and the last RCA session tragically ended with an almost hostile atmosphere in the room. Hence, for a second time, the unsettledness of the situation was not resolved. Thus, the main problematic of the original incident was reiterated in the RCA process: Bodily knowledge, feelings and tensions were

overruled once again while the blame-free rhetoric complicated matters unnecessarily and diffused responsibility in ways that affected the possibilities of seeking accountability, learning, resolution and 'release' in the aftermath of the sentinel event. This observation is backed by a similar study of RCA processes, where it is concluded that '[b]y officially banning blame and imposing a politically correct way of reflecting on incidents, blaming has been pushed underground, thereby making it less visible and more difficult to manage' (Mengis and Nicolini 2011: 183–184).

From a pragmatic stance, then, learning is inseparable from the ethos of the health professional. Thus, it is neither possible nor useful to leave the learner, the 'human condition' as it were, out of discussions about medical error and safety, even in cases of typical 'system errors' where there are no obvious signs of malpractice, reckless conduct, bad intentions or even unintended human error that needs to be attended to. Because there is a potential—also in the most systemic of incidents—that the health professionals and clinical teams involved could learn from the incident, could store it as an experience (perhaps of regret or remorse) and hence seek to change not only 'the system' but also their habits and future conduct in order to prevent incidents of a similar kind.

References

Beguin, P. (2009). Introduction: Shifting the focus to human work within complex socio-technical systems. In C. Owen, P. Beguin, & G. Wackers (Eds.), *Risky work environments: Reappraising human work within fallible systems*. London: Ashgate Publishing Ltd.

Benner, P., & Tanner, C. A. (1987). Clinical judgment: How expert nurses use intuition. *American Journal of Nursing, 87*(1), 23–31.

Bosk, C. L. (1979/2003). *Forgive and remember: Managing medical failure* (2nd ed.). Chicago: The University of Chicago Press.

Boud, D., Keogh, R., & Walker, D. (1985). *Reflection: Turning experience into learning*. London: Kogan Page.

Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge: Cambridge University Press.

Department of Health. (2000). *An organisation with a memory: Expert group report*. London: Department of Health.

Dewey, J. (1896). The reflex arc concept in psychology. *The Psychological Review, III*(4), 357–370.

Dewey, J. (1916/1966). *Democracy and education: An introduction to the philosophy of education* (1st paperback ed.). New York: The Free Press.

Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York: Promentheus Books.

Dewey, J. (1932/1985). Ethics. In J. A. Boydston (Ed.), *The later works of John Dewey, 1925–1953* (Vol. 7). Carbondale: Southern Illinois University Press.

Dewey, J. (1933/1986). Essays and how we think. In J. A. Boydston (Ed.), *The later works of John Dewey, 1925–1953* (Vol. 8). Carbondale: Southern Illinois University Press.

Elkjaer, B. (2001). The learning organisation: An undelivered promise. *Management Learning, 32*(4), 437–452.

Fox, S. (2000). Communities of practice: Foucault and actor network theory. *Journal of Management Studies, 37*(6), 853–868.

Gherardi, S. (2000). Practice-based theorizing on learning and knowing in organizations. *Organization, 7*(2), 211–233.

Green, C. (2012). Nursing intuition: A valid form of knowledge. *Nursing Philosophy, 13*(2), 98–111.

Hollnagel, E., Braithwaite, J., & Wears, R. (Eds.). (2013). *Resilient health care*. Surrey, London: Ashgate Publishing Ltd.

Hollnagel, E., Wears, R., & Braithwaite, J. (2015). *From Safety-I to Safety-II: A white paper*. The Resilient Health Care Net, Published by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia.

Hunter, I., & Saunder, D. (1995). Walks of life: Mauss on the human gymnasium. *Body & Society, 1*, 65–81.

Iedema, R., & Carroll, K. (2011). The "clinalyst": Institutionalizing reflexive space to realize safety and flexible systematization in health care. *Journal of Organizational Change Management, 24*(2), 175–190.

Jordan, S., Messner, M., & Becker, A. (2009). Reflection and mindfulness in organizations: Rationales and possibilities for integration. *Management Learning, 40*(4), 465–473.

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To err is human: Building a safer health system*. Committee on Quality of Healthcare in America, Institute of Medicine. Washington, DC: National Academy Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.

Mauss, M. (1934). Techniques of the body (B. Brewster, Trans. 1973). *Economy and Society, 2*(1), 70–88.

Mengis, J., & Nicolini, D. (2011). Challenges to learning from clinical adverse events: A study of root cause analysis in practice. In E. Rowley & J. Waring (Eds.), *A socio-cultural perspective on patient safety* (pp. 171–188). London: Ashgate Publishing Ltd.

Merleau-Ponty, M. (1962). *Phenomenology of perception* (C. Smith, Trans.). London: Routledge & K. Paul.

Mesman, J. (2008). *Uncertainty and medical innovation: Experienced pioneers in neonatal care*. Basingstoke, UK: Palgrave Macmillan.

Mesman, J. (2009). The geography of patient safety: A topical analysis of sterility. *Social Science & Medicine, 69*(9), 1705–1712.

Paget, M. (1988). *The unity of mistake: A phenomenological interpretation of medical work*. Philadelphia: Temple University Press.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.

Reason, J. (1990). *Human error*. Cambridge: Cambridge University Press.

Reason, J. (1997). *Managing the risks of organizational accidents*. London: Ashgate Publishing Ltd.

Reason, J. (2000). Human error: Models and management. *BMJ, 320*, 768–770.

Rew, L., & Barron, E. (1987). Intuition: A neglected hallmark of nursing knowledge. *Advances in Nursing Science, 10*(1), 49–62.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.

Schön, D. A. (1987). *Educating the reflective practitioner: Towards a new design for teaching and learning in the professions*. San Francisco, CA: Jossey-Bass.

Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday Currency.

Senge, P. M. (1999). The life cycle of typical change initiatives. In P. M. Senge et al. (Eds.), *The dance of change: The challenges of sustaining momentum in learning organizations* (pp. 5–10). London: Nicholas Brealey Publishing.

Senge, P. M., & Sterman, J. D. (1992). Systems thinking and organizational learning: Acting locally and thinking globally in the organization of the future. *European Journal of Operational Research, 59*, 137–150.

Weick, K. E. (2001). *Making sense of the organization*. Boston, MA: Blackwell Publishing.

Weick, K. E. (2007). Drop your tools: On reconfiguring management education. *Journal of Management Education, 31*(1), 5–16.

Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge, UK: Cambridge University Press.

WHO. (2005). *World alliance for patient safety: Draft guidelines for adverse event reporting and learning systems. From information to action*. Geneva, Switzerland: World Health Organization.

WHO. (2008). WHO surgical safety checklist. World Alliance for Patient Safety.

WHO. (2016). Patient safety research: Introductory course. Retrieved from http://www.who.int/patientsafety/research/online_course/en/

Yakhlef, A. (2010). The corporeal of practice-based learning. *Organizations Studies, 31*, 409–430.

Zuiderent-Jerak, T. (2015). *Situated intervention: Sociological experiments in healthcare*. Cambridge, MA: The MIT Press.

7

Stability and Change in Patient Safety

Throughout this book, I have frequently returned to the standardization ideal of mainstream patient safety management which is promoted equally in the safety programme's rhetoric of creating failsafe systems, in its preferred images such as the Swiss Cheese Model, as well as its tools and methodologies, such as the reporting and analysis of critical incidents. This particular approach to safety management can be coined as an ideal of creating prevention through standardization. It presupposes a fundamentally stable and predictable health system in which (human) errors can be predicted and prevented by systemic standardization measures (Department of Health 2000; Kohn et al. 2000).

The quest to organize, manage and optimize healthcare as a stable and predictable system has, however, proven troublesome. As argued by Allen et al., and as I have attested to in earlier chapters of this book, the idea of preventability through system optimization is from a sociological perspective 'overly reductionist, and can often result in mechanistic interventions which have unintended negative consequences' (2016: 183). This has led to sociological-driven critiques, much of which argues for approaching health systems based on more comprehensive and complex understandings of the political, technical and cultural dimensions of

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7_7

health organization. Thus, Jensen proposes that an analysis of healthcare from a sociological perspective must

> simultaneously deal with its intertwined social and professional, cultural and political, scientific and technical facets. Adverse events, for example, are surely not just (or primarily) due to human error at the ward level but are rather a systemic—or networked—consequence of the ways in which health work is related to cultures or management, governance, business and science. (Jensen 2008: 322)

In a similar way, Waring et al. argue that sociology can 'furnish insights into cultural, socio-technical, political and institutional forces that influence care quality' (Waring et al. 2016: 199)—i.e., the forces that the simplistic understanding of systems and human error of the orthodox view is likely to miss (see also Chap. 2).

Parallel to the sociological critiques, safety engineers have increasingly been criticizing the mainstream approach to patient safety for being built on a flawed understanding of systems. The most dominant of these alternative positions—the resilience engineering or Safety II perspective—is represented by a group of safety engineers that argue for a radically different approach to patient safety and systems thinking (Braithwaite et al. 2015; Hollnagel et al. 2013, 2015). Instead of thinking of safety in terms of reliability and preventability, Safety II thinking promotes robustness or resilience as the ability for complex systems to adjust their functioning and sustain their operations even during disturbances and in the presence of continuous stress in a constantly changing environment. This understanding of the resilience concept has been developed in the field of ecology (Holling 1973), and apart from its growing impact on safety science in general (e.g., Hollnagel et al. 2006; Weick and Sutcliffe 2007; Dekker 2011), it has had a strong impact on crisis adaptation, security response research and practices and, recently, finance (Walker and Cooper 2011).

The resilience model to safety places itself in direct opposition to mainstream patient safety thinking, now described as Safety I, by stressing the problems of understanding safety management as closing safety gaps in a system characterized by stability, linear rationality and simplicity. It is argued that although the Safety I approach has stretched 'our imagination

a bit […] it has changed nothing about our basic assumptions of safety and risk' (Dekker 2011: 58), and further that it 'has been popular to believe that this development has brought us systemic thinking about safety, about accidents. But it hasn't' (Dekker 2011: 58).

Advocates of resilience thinking therefore promote what they believe to be a more 'correct' version of systems thinking, where healthcare organizations are envisioned as non-linear and open systems, defined by their tight couplings, interactive complexity and systemic resonance, making predictability impossible. When dealing with complex systems and changing environments, adjustments are required constantly, and performance variability is therefore a necessary condition that ensures flexibility and adaptation. At the same time, however, adjustments and variability are also often the reason that things go wrong because systems can 'drift into failure' and allow for deviant practices (Dekker 2011; Hollnagel et al. 2013; Vaughan 1996). Therefore, resilience engineering is first to 'acknowledge the presence—and inevitability—of performance variability, second to monitor it, and third to control it' (Hollnagel et al. 2013: 13). To achieve this control, a new set of methodologies is developed reflecting the alternative understanding of health systems.

Although the mainstream approach is thoroughly dominating safety management practices in healthcare, the policy area is beginning to show signs that some of the critiques of the standardization approach are being heard, and especially the resilience perspective is being discussed and, increasingly, tried out in practice. It is therefore relevant to take a look at these alternative approaches, and not least the new types of solutions they present. Following Dewey's warning about *a priori* separation of stability and change as traits of reality, this chapter attends to Safety II's turn to resilience, complexity and flexibility and argues that in just substituting one view of systems as stable and predictable with another view of systems as complex and unpredictable a new type of certainty is presupposed, often in order to propose 'resilience-based' system-optimizing solutions to the problems of patient safety.[1] Hence, the uncertainty of medical practice and the indispensable experiences, skills and safety dispositions in acting with this type of uncertainty risks being undermined.

The Paradox of Stability and Change

Of the many *a priori* dichotomies Dewey sought to overcome in his work, the separation of stability and change formed a more overarching category with which many other dichotomies were related. In *Experience and nature* (1925) Dewey argued that most of the common dichotomies such as those of theory/practice and mind/body return to a controversy about the ontological status between stability and change in philosophy:

> One of the striking phases of the history of philosophical thought is the recurrent grouping together of unity, permanence (or the eternal), completeness and rational thought, while upon another side full multiplicity, change and the temporal, the partial, defective, sense and desire. This division is obviously but another case of violent separation of the precarious and unsettled from the regular and determinate. (Dewey 1925: 65)

Thus, in much classic philosophy, reality is understood as fundamentally stable, whereby philosophers in line with the predictive sciences have come 'to mumble universal and necessary law, the ubiquity of cause and effect, the uniformity of nature' (1925: 44). In opposition to this, Dewey identifies a growing number of 'philosophers of becoming' (Dewey 1925: 50) that count philosophers from Heraclitus to Bergson who insist that reality is changing and fluctuating, and therefore that 'the world of empirical things includes the uncertain, unpredictable, uncontrollable and hazardous' (1925: 42). Dewey, who is often portrayed as a process philosopher himself, is in agreement with the insistence that the world is *also* changing and unpredictable; however, he strongly criticizes what he describes as a new type of absolutism in these philosophical standpoints. This new absolutism is visible in the fact that often uncertainty, instability and flux are understood *a priori* as the defining traits of reality. In this way, constant change is predetermined, just as the more classic philosophies tend to predetermine stability; 'the philosophies of flux also indicate the intensity of the craving for the sure and the fixed' (Dewey 1925: 50). Therefore, Dewey argues, we are in the works of Hegel, Spencer and Bergson presented with a metaphysic of change in

which change is no longer a matter of description but of prescription praised for its own sake:

> Romanticism is an evangel in the garb of metaphysics. It sidesteps the painful, toilsome labor of understanding and of control which change sets us, by glorifying it for its own sake. Flux is made something to revere, something profoundly akin to what is best within ourselves, will and creative energy. It is not, as in experience, a call to effort, a challenge to investigation, a potential doom of disaster and death. (Dewey 25: 51)

Today it is common to think of Dewey as a philosopher who privileges the changing and fluctuating over the stable. Whenever such propositions are put forward it is important to keep his critique of the philosophers of flux in mind. With the act of dichotomization where either stability or change is deemed more primary and worthy than the other, neither the classic philosophies nor the philosophies of flux recognize that reality is a mixture of stability and uncertainty which contains order, completeness and predictability, as well as uncertainty, change and unpredictability. Empirically we can investigate the particular relation between the two traits in specific situations, and analytically we can then separate them, but we must keep in mind, Dewey reminds us, that the two traits are practically intertwined and indivisible, and that often 'change gives meaning to permanence and recurrence makes novelty possible' (Dewey 1925: 47).

Dewey has been criticized here for delivering a new metaphysics of generic traits of existence, which reveals a search for synthesis and therefore accentuates an underlying Hegelianism. However, as noted by Harris (2007), Dewey's ideas of the inseparability of the stable and the precarious should not be understood separately from his more practical writings on education and learning. Most notably, perhaps, the interconnectedness and mutual dependency between stability and change is a vital part of Dewey's notion of habits. As described in Chap. 6, Dewey defines habits as 'the kind of human activity which is influenced by prior activity and is in that sense acquired' (Dewey 1922: 42). As such, habits refer broadly to our 'stored' patterns of action and thinking that have become stabilized over time to save us time by choosing the best possible courses

of action based on earlier experiences. Thus, habits are not mindless routines but are often flexible and dynamic dispositions to act in certain experience-based ways adaptable to the particularities of the actual situation. In this way, habits are both stable and adaptable, and to Dewey, the quest is to nurture and create 'intelligent habits' that retain their stability while remaining adaptable to the particular context.

Much like Dewey, the goal of a number of recent studies has been to dismantle what seems to be an apparent paradox of stability and change, which is apparent because it only arises, as Farjoun (2010) argues in his article entitled 'Beyond Dualism: Stability and Change as a Duality', when the two concepts are defined as opposites and separate as is largely the case within organizational studies (see also Dewey 1917). Here, it is often assumed that 'stability and change, and the practices, processes, and forms that support them, are largely incompatible and mutually exclusive' (Farjoun 2010: 202). This leads to familiar dichotomies such as exploitation and exploration (March 1991), episodic and continuous change (Weick and Quinn 1999), as well as the prevailing idea that bureaucracy, standardization and rational design work well in stable settings and for specialized tasks, while more organic and flexible structures are required in changing environments and for complex and non-routine tasks. Although such perspectives often recognize that stability and change are both needed, the line of reasoning is generally founded on a dichotomizing idea of separation and opposition between stability and change. In recent debates, the pragmatic quest to overcome this separation is echoed, and it is increasingly suggested that approaching organizational design through the paradox of stability and change is too restrictive to capture the complexity of organizational reality where change and stability are often interdependent, complementary and constituent of each other (Sutcliffe et al. 2004; Levinthal and Rerup 2006; Farjoun 2010). With Dewey as a frequent source of inspiration, the attempt to overcome the tendency to think of stability and change as separate and oppositional organizational qualities has been particularly noticeable in discussions on routines and habits in organizational life (e.g., Feldman and Pentland 2003; Cohen 2007).

In a self-acclaimed attempt to 'turn patient safety on its head' (Braithwaite et al. 2015), the resilience perspective on patient safety is

mobilizing a large number of 'from–to' arguments: from probability to variability, from resultant to emergent, from prevention to adaptability, from stability to flux, from linearity to complexity, from closed systems to open systems and from failures to a 'positive' focus on 'what goes right'. In itself, this oppositional stance of the resilience perspective contributes to the establishment of a paradox of stability and change in present safety management thinking. However, it seems that the particular expression of the paradox comes in at least three versions, which are all variations of what, within recent discussions of safety science, have been determined as a question of 'complementarity or substitution' between Safety I and II (Hale 2014: 67).

Arguments of Substitution: From Standardization to Resilience

The argument of substitution between Safety I and Safety II measures comes in an ontological and a historical version. The most simplified version is based on an idea of ontological substitution. Here, ontological arguments of an essentially complex, fluctuating and unpredictable world are used to promote a radical substitution of older conceptual tools with new ones. Safety is achieved 'not by adding one more concept to the existing vocabulary, but by proposing a completely new vocabulary, and therefore also a completely new way of thinking about safety' (Hollnagel et al. 2006: 2). As part of the ontological substitution argument, healthcare is often described *in general* as 'a complex adaptive system (CAS)—or even an autopoietic system' (Hollnagel et al. 2013: 229). Here, standardization is understood not only as potentially inefficient but counterproductive as it can lead to a system in which even slight disruptions can render it dysfunctional. The change in the ontological foundations of safety modes is often argued by turning to complex system theory, but broader metaphysical arguments are also implemented, as when Dekker (2011), for example, argues that orthodox safety efforts are dominated by a 'Newtonian ethic of failure' (Dekker 2011: 76), which is 'not helpful for meaningfully modeling the messy, constantly changing, kaleidoscopic interiors of organizational life where failures and successes are

spawned' (Dekker 2011: 64). Therefore, Dekker argues, safety science should look to postmodernism, complexity theory and chaos theory in the quest to establish a new world view—a second family of explanations—to replace the former 'modern' world view. With the introduction of this 'new world view', a substitution of stability with change is done in a manner not far from what Dewey determined as a Bergsonian metaphysics of change (Dewey 1925; see also Du Gay and Vikkelsø 2012).

The second version of the separation argument is one of historical replacement between Safety I and II based on a 'before and after' structure, where it is suggested that healthcare systems are moving historically from simple structures to more complex ones. It is argued, for example, that the assumptions of Safety I do 'not fit today's world, neither in industries nor in health care' (Hollnagel et al. 2015: 4) because, on the one hand, healthcare settings have become increasingly complex and, on the other, healthcare organizations have been subjected to 'a tsunami' of constant change imperatives (Hollnagel et al. 2015: 16). With increased instability, change and complexity, the linear cause–effect explanations of failures and unwanted system outcomes are no longer viable. Within this line of reasoning, it is, for example, stated that simple linear accident models are 'well-suited to situations that resemble what work was like in the 1920s and 1930s' (Hollnagel et al. 2015: 23) and that composite linear models (such as James Reason's Swiss Cheese Model, 1990) were suitable in the 1970s and 1980s 'but not the 2000s and beyond' (Hollnagel et al. 2015: 23). Hence, it is summarized that '[m]odels and methods which require that systems are linear with resultant outcomes cannot and should not be used for non-linear systems where outcomes are emergent rather than resultant' (Hollnagel et al. 2015: 23). Although the argument here is historical rather than ontological, the result is often also one of substitution: As organizations become increasingly complex, older linear models of safety management need to be substituted with new ones based on principles of resiliency.

The substitution idea finds support in other fields such as organization studies. The general assumption that safety management must deal with either essentially or increasingly complex, fluent and constantly changing organizational realities is echoed not least in the work of Karl Weick, who is more than any other organizational theorist associated with notions of

resilience, flexibility, innovation, adaptability, loose coupling and improvisation (Weick 2001, 2007; Weick and Sutcliffe 2007). This has not gone unnoticed in patient safety circles, and Don Berwick who identifies himself as a 'real fan of the work of Karl Weick' argues that *Managing the Unexpected: Resilient Performance in an Age of Uncertainty* by Weick and Sutcliffe (2007) should be required reading in healthcare improvement circles (IHI 2017).

In one of Weick's most cited texts, he analyses the Mann Gulch disaster, a forest fire in which 13 firefighters lost their lives. Weick here argues that it was the firefighters resistance to 'drop their tools' as well as their reliance on 'doing everything by the book' and depending on 'dispatchers, specialization, regimentation, rules' (Weick 2001: 111) that caused the tragedy. They relied on a stable reality that was not to be found. The foreman of the firefighters, however, used an 'escape-fire', which Weick determines as an on-the-spot intervention, and survived. In this way, the foreman is a perfect example of what Weick, with reference to Lévi-Strauss, calls the bricoleur, namely, a person who has no book, does not rely on rules and routines, drop his tools and improvises: 'The advantage of improvisation is that it is responsive to ongoing change in the organization and the environment, and standardization removes this advantage' (Weick 2001: 77).

This separation of stability and change implied in Weick's 'drop your tools' argument is reproduced in a later paper (2007), where he in more general terms suggests that 'older tools tend to be overlearned' (2007: 13–14); that we need to 'drop traditional ways of acting' (2007: 14); and, quoting an investigation report concerning the Challenger disaster, that 'when lives are on the line, flexibility and democratic process should take priority over bureaucratic response' (2007: 6).[2] Weick concludes by summing up his organizational enemies under the common headline 'rationality':

> To drop the tools of rationality is to gain access to lightness in the form of intuitions, feelings, stories, improvisation, experience, imagination, active listening, awareness in the moment, novel words, and empathy. All of these non-logical activities enable people to solve problems and enact their potential. (Weick 2007: 15)

The dichotomy between standardization, rules, control and rationality, on the one hand, and improvisation, flexibility and other so-called non-logical activities, on the other, is the extreme version of the substitution argument so common for the Safety II perspective.

Situated Separation Arguments

The third version of the stability–change argument involves an attempt to locally identify and separate healthcare sites dominated by stability from healthcare sites dominated by change in order to create situated certainty. This proposition, which I describe as 'the situated separation argument', involves an understanding not of substitution but of complementarity between Safety I and II. The complementary approach is generally based on the realization that some organizational settings are dominated by simple structures and some by complex ones—and that although organizational complexity might be increasing, some types of organization are still founded on stable conditions, well-defined tasks and a high degree of predictability, in which case Safety I thinking and tools are still viable. It is often simply suggested that '[t]he way forward […] lies in combining the two ways of thinking' (Hollnagel et al. 2015: 5) or that 'Safety-II is intended as a complement to Safety-I rather than as a wholesale replacement. The two perspectives on safety must co-exist, at least for the foreseeable future' (Braithwaite et al. 2015). This quote also indicates how the three positions—ontological, historical and situated—are often stated simultaneously by the same authors, are somewhat confused or overlapping or are ambivalently expressed. In this case, the situated position is challenged by a historical substitution argument by the inserted 'for the foreseeable future'.

Within the social sciences, especially within Science and Technology Studies, a more situated approach to the relation between stability and change has also been advocated. In a quest to rethink and nuance the understanding of formalization, rules and standards in healthcare, a number of authors have turned specifically to the relationship between stability and change by introducing new categories such as 'flexible

standards' (Timmermans and Berg 2003), 'situated standardization' (Zuiderent-Jerak 2007, 2015) and 'flexible systematization' (Iedema and Carroll 2011). At times, these studies opt for a separation of stability and change not unlike that of the situated separation arguments of the resilience literature. In *The Gold Standard* (2003), Timmermans and Berg argue as follows:

> In redesigning care processes, standardization should thus be localized in only some specific parts of the health care process (e.g., routine diagnostic tests, repeated aspects of therapeutic trajectories, recurring triage moments, etc.). In other aspects of the health care process, possible variation should be embraced. (2003: 210)

Similar to this argument, Zuiderent-Jerak argues that situated standardization 'tries to empirically elucidate specific issues in care delivery so that an assessment can be made, of which aspects of the organization of care should be given space and which aspects should be standardized' (Zuiderent-Jerak 2015: 72). This type of reasoning is echoed in Iedema and Carroll's notion of 'flexible systematization' that is developed to promote the institutionalization of reflexive spaces in healthcare (Iedema and Carroll 2011). Although the mentioned Science and Technology Studies (STS) approaches are often sceptical towards system engineers' attempt to optimize healthcare (see, for instance, Zuiderent-Jerak and Berg 2010) and although these important situated approaches work towards the creation of health systems that work with a repertoire of both standardization and flexibility measures, the situated separation argument is built on an assumption that health settings or care processes can be divided into stable and linear ones and unstable and complex ones and that in the stable parts standardization measures are effective while in the more unstable parts variation is needed. This division functions as the precondition for intervention and for an optimistic attitude in regard to the possibilities of creating failsafe systems through clever system design. I describe some of the problems of relying too much on this presupposition in a few pages but first a look at some of the solutions and technologies suggested by the Safety II perspective.

Towards System Engineering 2.0?

The separation of stability and change—whether argued by way of ontological, historical or more situated propositions—enables Safety II positions to maintain the system-reengineering optimism that is characterized as one of the most important features of the seminal reports of the patient safety movement (See Jensen 2008). By injecting a new type of certainty into healthcare improvement thinking, a belief in the 'certainty of change' to either substitute or supplement the dominant 'certainty of stability' paradigm, a new set of improvement technologies are being developed. This Safety II improvement agenda is based on the rejection of the 'causality credo' (Hollnagel et al. 2015: 13) of Safety I, as it seeks to introduce new safety solutions in line with an understanding of healthcare systems as non-linear, open and complex systems and based on proactivity and learning from success and not only failure. Although the actual form of such new resilience solutions is not always described, some suggestions have been given. One group of suggestions includes reengineering initiatives, where standardization as the guiding organizational principle has been substituted with flexibility or slack. As described, such substitution can in its most generalized version become an unspecific call for improvisation, flexibility and non-logical activities (Weick 2007). More concrete reengineering solutions include, for instance, the design of flexible spaces in hospitals: 'By designing rooms that can be rapidly re-purposed, but are not unnecessarily redundant, the hospital can adapt more easily as situations change, perhaps improving safety and reducing costs' (Bosch and Wears 2013: 8); or the design of technological infrastructure: 'IT, including information systems and infusion devices, can be created so they can adapt to the fluid, variable clinical health care work setting' (Nemeth et al. 2008: 8).

A second group of suggestions concerns the shifts from measuring and controlling the level of errors to measuring and controlling the level of safety in the organization, not least in order to prevent possible 'drift into failure' (Jeffcott et al. 2009; Hollnagel 2012a; Hollnagel et al. 2013). This includes inventing new types of measurement, improvement and prediction tools that can help health systems foresee, cope with and recover from errors and variabilities (Jeffcott et al. 2009; Hollnagel et al. 2013).

An example is the Functional Resonance Analysis Method (FRAM) developed by Erik Hollnagel (2012a) to analyse the 'functional resonance' arising from everyday performance variability. The main goal of the model is 'to represent and understand the dynamics of complex sociotechnical systems' (Hollnagel 2012a: 89). By describing the main functions of certain activities, the model's purpose is to propose ways of managing possible 'occurrences of uncontrolled performance variability' (2012a: 87). Hollnagel's model is based on a situated separation argument stating that while linear accident models are still useful in situations where activities are regular and homogeneous, the FRAM model is to be used when accidents occur 'as emergent and nonlinear outcomes of dynamic system processes' (2012a: 88).

Finally, many suggestions are aimed at implementing more centralized management functions to ensure the spread of Safety II and resilience thinking in the organization, to build in safety as a system property at all levels, and not least to achieve some kind of overview over the complex system in order to coordinate and control it. In one paper, it is suggested, for instance, that an 'Interprofessional Safety Performance Department' should be established in hospitals. Such a department 'should be acquainted with the concepts of high reliability, resilience, and have investigative skills congruent with the "new view"' (Sheps and Cardiff 2011: 155).

What the proposed resilience technologies seem to have in common, at least in their current form, is that they do not seem radically different from the type of solutions that are considered useful safety solutions in the Safety I toolbox. This includes the prospect of safety initiatives quickly being integrated into a productivity agenda where it is claimed that resilience can provide 'the means for organizations to target resource investments by integrating safety and productivity concerns' (Nemeth et al. 2008: 1), as well as the prospect of becoming part of the dominant 'measure-and-manage orthodoxy' (Waring 2009) of conventional patient safety thinking by substituting the measuring of errors (incident reporting) with the measuring and monitoring of performance variability and 'drifts into failure'. As instances of safety science, improvement technologies of Safety I and Safety II perspectives alike are more generally based on an understanding of the healthcare system's characteristics as certain

in some sense (whether as stable and simple or changing and complex). This separation of stability and change helps pave the way for a shared interventionist faith in the value of system engineering performed by safety specialists, a discipline of which the most prominent authors of both Safety I and Safety II literature are themselves part.

A Factor-Ten Error, Failed Safety Steps and an Experienced Nurse

In what follows, I present a factor-ten medical error that can simultaneously display some of the dominant arguments of both sides of the standardization/resilience divide while, at the same time, identify some of the challenges of separating stability and change in order to maintain the possibility of system-optimizing healthcare organizations.

In the spring of 2010, a critical incident took place at the large Danish university hospital where I conducted my fieldwork. The situation concerned a medication error that occurred in the process of producing chemotherapy drugs for a small child. Caused by unreadable script on a handwritten prescription, as well as a number of failed safety steps, the university hospital received two doses of chemotherapy ten times the prescribed strength from the hospital's dispensary. Had the so-called factor-ten error (ten times the prescribed dose) not been averted by an attentive nurse just before the chemotherapy was to be given to the child, it would most likely have had a fatal outcome.

Errors due to illegible handwriting on prescriptions and in patient records is a known and discussed problem in patient safety literature, and it is often used as one of the reasons for introducing information technology (IT) systems such as electronic patient records or electronic systems for prescriptions (Aspden et al. 2006). The specific problem of factor-ten errors is also well known. In one study, it is concluded that tenfold prescribing errors in a 631-bed American teaching hospital occurred in more than 0.5 per cent of paediatric admissions. Out of the 200 tenfold prescribing errors, which were detected at the hospital during an 18-month period, 87 of them were caused by a misplaced decimal point (Lesar 2002).

The root cause analysis (RCA) of this sentinel event lasted for two meetings of around 2 hours each and involved the participation of 12 people, including frontline personnel, team leaders, the centre director of the implicated medical centre, a quality coordinator, the hospital's risk manager and two representatives from the regional unit for patient safety, who were there to lead the process because the incident involved various parts of the healthcare system. Based on my observations of the RCA sessions, the final written report of the process, as well as patient journals and other materials, it is possible to summarize the case thus:

A paediatrician at the university hospital orders 16.5 mg of Adriamycin with a handwritten prescription for a child. Although the punctuation is hard to read (it is unclear whether it says 16.5 or 165), a colleague provides the order with a countersignature, an established safety procedure to ensure the correctness of the prescription. Subsequently, the prescription is faxed from the clinic to the hospital's dispensary where an experienced dispensing chemist performs a second safety procedure; he double-checks the prescription by performing a recalculation of dose in relation to the child's body surface (the body surface area is calculated on the basis of height and weight). He, however, also reads the order as 16.5 mg and therefore approves it before sending it for mixing. At the dispensary's department for chemotherapy production, an inexperienced pharmacologist reads the prescription as 165 mg, and prepares a pack of supplies for mixing according to a tenfold dose. This package is passed on to the mixing room where two persons are present: a experienced pharmacologist—with the responsibility for mixing the compounds (referred to as 'the mixer' in the RCA sessions)—and an assistant chemist in the role of a helper. Both read the order as 165 mg and the already prepared package of supplies confirms their reading. However, the pharmacologist, the mixer, is concerned about such a high dose for a child and states this unease aloud a couple of times. Confronted with this, the assistant argues that the dose must be correct, as the dispensing chemist has approved it. The mixer accepts. After production, the mixtures are passed on to a second dispensing chemist with little experience in the production of chemotherapy for children; he also reads the prescription as 165 mg and approves it, thereby performing a third safety procedure. The prepared chemotherapy is sent to the clinic. When the mixture is prepared for

administering to the child, an experienced nurse notices its abnormal colour: It seems to be too red. She examines the original prescription in the patient's journal, after which the factor-ten error is discovered and the risk of potential injury averted.

Safety I and II Solutions to the Factor-Ten Error

As one would expect from an RCA, the problem of variation was quickly determined as the primary cause of the incident. In line with the patient safety programme's inspiration from human factors research and cognitive psychology, the unreadable handwritten number was perceived as quite a classic case of human error caused by 'human factors' such as sloppiness or inattention. Another main problem with the handwritten prescription was that, from this perspective, to be able to correctly decipher the indistinct handwritten number, one had to rely on the experience of the person reading it. The problem of experience was also argued to be the reason for the failed last control procedure: To be able to approve the mixtures without a new calculation of size and dose, the dispensing chemist would need experience.

In relying on experience, it is argued, the system contains an element of chance; a variation problem that should be solved by standardization and the introduction of failsafe systems. At the RCA meetings, a representative for the regional unit of patient safety who was guiding the process expressed the overall problem of the factor-ten error like this: 'This is a classic example of how it can go wrong when we build our systems on experience.' Later she followed up this statement by announcing that 'here we have a system, which is not safe enough when it comes to people who have no experience with chemotherapy for children. It is all about the system.'

In response to the question 'How can a factor-ten medication error occur in the process of dispensing chemotherapy to a child?' by which the RCA was initiated, three root causes were identified and, for all three, action plans were provided. The main root cause of the incident was determined as the problem of handwriting, especially in relation to punctuation, on faxed prescriptions. The action plan departing from this cause

suggested the introduction of a new electronic system for prescriptions. The second root cause involved the failure of the last safety procedure, where a dispensing chemist approved the faulty mixtures. Here, a new safety procedure was suggested involving an additional calculation of surface and dose at the end of the production process. Third, the mixer's suspicion that something was not right led to the formulation of a action plan that confronted the non-existing praxis for responding to doubts and hunches from the personnel in the chemotherapy production process. Here, it was suggested that a sticker system should be introduced in the mixing room to allow the mixer to express doubts by way of placing a red sticker on the mixed product.

The three action plans are all in accordance with the overall ideal of the safety programme: namely, to identify the standards, rules and safety systems that can be readily implemented so as to prevent future incidents. However, on closer inspection, the root causes and action plans are slightly different. From the perspective of eliminating variation in the system by reducing reliance on experience, the two first root causes and their solutions are just by the book. In the final RCA report, both causes were crossed off as confirming the question 'If the root cause had not existed, would the incident have occurred?'. Following this logic of error prevention, the action plans, which were designed to eliminate the root causes, simultaneously removed the possibility that future incidents of an analogous kind could occur. They thereby fulfilled the primary goal of the RCA to prevent errors through standardization.

However, the last action plan is somewhat different. Although the red sticker solution is also a standard, the expression of hunches through red stickers is a kind of 'whistle-blower' function which indicates that human reflections and intuitions are necessary, at least to detect system breakdowns. In this way, the solution is quite similar to the 'timeout' solution from the RCA process following the misdiagnosis of a pregnant woman laid out in Chap. 6. Here, the problem of hunches and intuitions about misdiagnosis led to the establishment of a 'timeout' function so that, in the handling of acutely ill patients, the implicated healthcare personnel had the opportunity to express doubts.

The idea that human intuitions can function as 'red flags' in determining system failure is in line with the Safety II approach to patient safety. Here, it is stressed that 'sensitivity to weak signals—that the work is not going as planned or expected—and understanding that unexpected resonance amongst actors, equipment and patients can create novel problems (surprise) is central to creating safety' (Sheps and Cardiff 2011: 155). In the RCA (i.e., from a Safety I perspective), the red sticker plan was identified as a less perfect solution because of its dependency on human 'variability'; to the question of whether an elimination of the root cause would have prevented the incident, the answer was marked with a cross in the 'Don't Know' box. From a Safety II perspective, a lack of preventability would obviously not degrade the solution. In complex systems one does not know whether incidents are prevented, the argument goes, and therefore we need resilient and adaptive organizations to 'absorb' errors before they escalate.

From one perspective, the solutions to the factor-ten error can be seen as evidence that although the action plans following the incident are not deemed equally perfect from a Safety I ideal of reducing variability, Safety I and II measures are quite unproblematically mixed in solutions to safety issues in certain concrete safety practices. Taken together, then, the three action plans can be understood within the frame of what I earlier determined as the situated separation argument; i.e., the attempt to determine what part of the process needs standardization measures (action plans 1 and 2) and what part needs resilience measures (action plan 3). When addressing the red sticker plan explicitly, it also resonates with the current calls for more flexible, situated and reflexive types of standardization (Timmermans and Berg 2003; Zuiderent-Jerak 2007, 2015; Iedema and Carroll 2011) as the initiative can be said to introduce an element of flexibility or reflexivity in the medication production process through a standard.

But the attempt to system-optimize the process through introducing new types of safety systems (whether built on Safety I or Safety II ideals) has its challenges. In the last part of this chapter, I address these challenges starting with one of the classic arguments against system optimization coming from Charles Perrow (1984), who can be said to also posit a type of situated separation argument. Importantly, however,

this argument is used to pose a critique of a certain type of organizations rather than to support the introduction of new clever system designs.

Charles Perrow and the Problem of System Optimization

It is hardly possible and even less desirable to write a book about safety without attending to Charles Perrow and his *Normal Accidents: Living with High-Risk Technologies* (1984). This widely cited and awfully important book is, interestingly, equally referred to within Safety I and Safety II—and, I believe, equally misunderstood. Although *Normal Accident* covers several themes within safety research, and is said to father even more, the basic argument of the book is surprisingly simple: Based on case studies of complex high-risk organizations, Perrow states that if organizations are simultaneously interactively complex and tightly coupled, they are prone to accidents. That is, if work processes are so complex that errors are not discovered—as they are not foreseeable or perhaps even incompressible for the people working in the organization—as well as so closely coupled, time-dependent and invariant that they leave no space or possibility of recovering from error, then smaller errors are likely to interact and create a large-scale systemic or 'normal' accident.

Within the mainstream approach to patient safety, *Normal Accidents* is primarily used to argue for its blame-free perspective. In *To Err Is Human* (Kohn et al. 2000), Perrow's analysis is reproduced in these very general terms: 'When large systems fail, it is due to multiple faults that occur together in an unanticipated interaction, creating a chain of events in which the faults grow and evolve. Their accumulation results in an accident' (Kohn et al. 2000: 52). The reference to Perrow here serves not so much to introduce an understanding of the system in question, but rather to introduce the blame-free principle into safety management. By reference to systemic failure and complex systems it is said, for instance, that '[t]he complex coincidences that cause systems to fail could rarely have been foreseen by the people involved' (Kohn et al. 2000: 53). As Casper

Bruun Jensen (2008) has argued, the use of Perrow in *To Err Is Human* involves an interesting incident of knowledge translation where Perrow's description of normal accidents as systemic errors in complex systems is turned into the opposite argument. By way of a creative reformulation, Perrow's normal accident argument about a certain type of systemic error is used to support Safety I's idea of humans as the main cause of error:

> Perrow has estimated that, on average, 60–80 percent of accidents involve human error. There is reason to believe that this is equally true in health. An analysis of anesthesia found that human errors were involved in 82 percent of preventable incidents; the remainder involved mainly equipment failure. (Kohn et al. 2000: 53)

In this way, the mainstream approach uses Perrow to argue that human errors are normal, that 'to err is human' and that the normality of this means that we should stop blaming people for their errors (see also Chap. 3).

To the Safety II position, Perrow is used to state that accidents are 'non-linear phenomena that emerge in a complex system' and 'that accidents can be seen as due to an unexpected combination or aggregation of conditions or events' (Hollnagel 2006: 12). By stressing that accidents (and, it is often implicitly assumed, errors in general) are complex, interactive, often incomprehensible and 'in a very fundamental sense […] non-linear phenomena' (Hollnagel et al. 2006: 354), it is argued that the Safety II approach is 'built' on Perrow's accident theory (Sheps and Cardiff 2011: 151). But Perrow's theory of system accidents is replicated in highly generalized terms: Complexity and tight coupling are not understood as that which characterize a particular kind of organizational set-up, but are rather evoked in a general defence of the resilience perspective. Here the need to 'cope with complexity' is being inscribed into an ontological or historical separation argument, often in order to describe a general 'post-modern' condition: 'The world in which people had to cope had gradually become more tightly coupled and less linear, in other words less easy to understand. Paradoxically, as the world had become more complex, coping had become more important' (Hollnagel 2012b: 124).

What is hardly addressed in both Safety I and Safety II approaches, then, is that Perrow speaks of a very particular organizational set-up when addressing the specific and rare issue of system accidents, which he also

labels as normal accidents. It is not that errors are not frequent, according to Perrow, they inevitably happen all the time in organizations, but the particular instances where they accumulate to become an accident and where this accumulation could not have been foreseen because of interactive complexity or stopped because of tight coupling is 'uncommon, even rare' (Perrow 1984: 5). Importantly, then, Perrow's accidents are not normal as in common but normal as in inevitable in *certain* types of organizational set-ups. In Perrow's book on normal accident, his own solution to the problem of this particular kind of accidents is not highly elaborated, as the book should primarily be read as a critique. However, it does shine through in all its simplicity: The solution to the problem of interactive complexity and tight coupling is to reduce complexity and coupling. Create systems that are more forgiving so that '[o]perators have more time to take action and can take more actions' (Perrow 1984: 38). Apart for time slack, 'operators' must also have certain degrees of freedom, so that 'those at the point of disturbance must be free to interpret the situation and take corrective action' (Perrow 1984: 332). The closest Perrow comes to defining this freedom is in the following paragraph where he describes how operators 'must be able to "move about", and peek and poke into the system, try out parts, reflect on past curious events, ask questions and check with others' (Perrow 1984: 333). Although, at first sight, this resembles the bricoleur argument of Karl Weick (2001), Perrow does not imply that such 'peeking around' should be based on improvisation rather than on tools, routines and past experiences. On the contrary, Perrow seems, in general, to argue for relying on human routine, skill and experience as a precondition for safety, and therefore for creating systems that allow for humans to take the necessary discretionary action when needed.

In *Normal Accidents*, however, Perrow addresses some of the high-risk systems where reductions of slack and complexity are not possible, such as the nuclear power industry and chemical plants. Here, Perrow argues,

> [w]e have produced designs so complicated that we cannot anticipate all the possible interactions of inevitable failures; we add safety devices that are deceived or avoided or defeated by hidden paths in the system. The systems have become more complicated because either they are dealing with more deadly substances, or we demand they function in even more hostile environments or with ever greater speed and volume. (Perrow 1984: 12)

Perrow's pessimism is therefore directed specifically at these complex high-risk systems, which will remain dangerous no matter how many safety devices we introduce—such organizations are, he argues, inevitably prone to accidents.

Perrow, then, is not discussing the increased complexity of society as a 'postmodern' condition, and he is not talking broadly about errors as systemic and incomprehensible (and hence 'non-blameable'). Rather, he uses complexity theory to deliver a critique of particular organizational set-ups. Conventional explanations of accidents, Perrow argues, 'do not account for variations in the failure rate of different kinds of systems' (Perrow 1984: 63), and, he continues, '[w]hat is needed is an explanation based upon system characteristics' (1984: 63); i.e., the context-specific characteristics of the particular system in question. Perrow suggests that we analyse the situation under scrutiny to see if complexity and coupling are important characteristics of the organizational set-up—and, if so, to reduce these organizational traits, if at all possible, to prevent inevitable failures from escalating into serious accidents.

The Accumulation of Failed Safety Procedures

If we evoke Perrow's argument with regard to the factor-ten medication error described earlier in this chapter, we find that while the highly standardized chemotherapy production process is not complex (as in unpredictable), it is indeed tightly coupled. And although the tight coupling argument cannot explain the initial problem of the unreadable punctuation on the prescription, it can partly explain why the incident was not averted until the very end, despite the presence of three standardized safety steps: the countersignature on the prescription at the clinic, the approval from the dispensing chemist before the doses were mixed as well as the approval of the second dispensing chemist at the end of the production process.

Not only did the safety procedures not work according to their prescribed purposes, the tight coupling of the system also played an unfortunate part in preventing the mixer from reacting to her doubts, intuitions

and safety dispositions, whereby she could have averted the incident much earlier in the process. At this point, two obstacles can be listed that relate to the strictly coupled production process of chemotherapeutic drugs: First, the safety procedures and steps leading up to the mixing procedure seemed to prevent the mixer from following her hunch; most clearly, the earlier approval from the dispensing chemist had this effect. The second obstacle concerned the physical setting: Safety requirements demand that mixers change clothes when going into and out of the mixing room and, when in the room, the persons inside are not allowed to open the door to ask questions to those outside before the mixing is completed. A phone was installed in the room; however, there was no culture of using it to ask questions or to express doubts of any kinds. As a result, a situation was created in which the possibility for acting on intuitions and doubts was reduced. From a 'normal accident' perspective this is an obvious case in which 'the operator loses the ability to correct a minor failure in a part rather than shutting down a whole unit or subsystem' (Perrow 1984: 79): Because of the lack of 'slack' in the production process a simple failure escalates.

Accordingly, then, both of the mentioned obstacles to the mixer's reaction to her hunch that something was not right were related to safety procedures: safety procedures to assure the correctness of the prescription process, which in this case had the opposite effect, and safety procedures in relation to the handling of medication, which had isolation and lack of communication as a result. It is therefore reasonable to question whether introducing yet another safety procedure is the most optimal solution to the problems posed by the incident. As Perrow suggests, such new procedures might well increase the complexity and coupling, whereby new interactions of failures are made possible. This argumentation is exemplified, for instance, in Perrow's objection to the common reaction to fires in plants, aeroplanes, ships and so on: 'Next time they will put in an extra alarm system and a fire suppressor, but who knows, that might just allow three more unexpected interactions among inevitable failures' (Perrow 1984: 4).

From a Perrowian stance, then, there are challenges equally with the second and third action plans of the RCA, because both—through a new calculation practice and a red sticker system accordingly—introduce new

safety procedures in an already tightly coupled system. Although the sticker solution might somewhat increase the possibility that hunches are reacted on in the mixing room (although the never-used phone in the room somewhat challenges this interpretation), it will, at the same time, introduce yet another element, yet another safety procedure, in an already tightly coupled and time-dependent process.

A Pragmatic Stance on the Factor-Ten Error

While Perrow's *Normal Accident* is primarily a warning against the ideal of failsafe organizing, especially in certain high-risk industries, it also posits a situated separation argument that at times places a somewhat simplistic faith in the possibility of separating industries into categories based on the level of complexity and coupling, for instance, by placing categories of high-risk industries within a so-called Interaction/Coupling Chart, which 'puts interaction and coupling together in a two-variable array' (Perrow 1984: 96). In determining whole classes of industries in this somewhat generic way, Perrow is not completely without blame in relation to some of the common misinterpretations of his work.

If we turn to some of Perrow's earlier work, especially his contingency approach to organizations, a more nuanced understanding of the relationship between stability and change, rule and flexibility, linearity and complexity in particular situations of organizing seem to appear. Thus, in *Complex Organizations* (1972), Perrow discusses a common critique of bureaucracies disclosed as a general wish to reduce rules. In what he describes as the 'social engineering or planning attack', bureaucracies 'are said to be inflexible, inefficient, and, in a time of rapid change, uncreative and unresponsive' (Perrow 1972: 6). Perrow here criticizes that a simple dichotomy is often evoked to describe different kinds of organizational set-ups, such as the so-called technological theories that classify organizations in terms of 'the kinds of tasks that are performed in them, and this is presumed to affect the structure of the organization' (Perrow 1972: 162). These theories, of which Henry Mintzberg's ideas about different organizational structures are probably the most well known (e.g., Mintzberg 1983), establish that '[w]hen the tasks people perform are well

understood, predictable, routine, and repetitive, a bureaucratic structure is the most efficient' (Perrow 1972: 162), and, on the other hand, '[w]here tasks are not well understood, generally because the "raw material" that each person works on is poorly understood and possibly reactive, recalcitrant, or self-activating, the tasks are nonroutine' (Perrow 1972: 162). This argument, which immediately bears resemblance to the separation arguments within contemporary safety management as described earlier in this chapter, maintains a distinction between routine and nonroutine (or stability and change), which is, according to Perrow, not fruitful:

> By clinging to a routine-non-routine distinction, the technological theories too often place a caricature of Weber in the former and the human relations model in the latter type of organization, and we have a replay of the old social-psychological distinction between initiating structure and consideration. What promises to be a way out of these oversimple dichotomies is in danger of becoming trapped by them. (Perrow 1972: 165)

Not only are these dichotomies 'oversimple' so that, for instance, 'there could be more than one variety of routineness' (Perrow 1972: 166), they are also often false insofar as rules and discretion are in many instances highly dependent on each other. Perrow defines rules as 'an invisible skein which bundles together all the technological and social aspects of organizations. As such, rules stem from past adjustments and seek to stabilize the present and future' (1972: 28). Such rules can be written down, or they can be unspoken and a matter of custom. Moreover, they are, especially the good ones, rarely noticed.

Perrow's realization that even the theories that seek to overcome the paradox of stability and change risk reproducing the very same dichotomy should be remembered when approaching the situated separation arguments advocated by parts of Safety II and in certain STS attempts of rethinking standardization. Because even the situated position—although more nuanced than the substitution arguments—is often based on faith in the possibility of easily separating simple settings characterized by low variance, predictability, continuity and routine from settings characterized by high variance, flexibility and complexity. And, accordingly, to

ascribe safety management tools that increase control, standardization, and formalization to the first of these settings while maintaining that the second type of settings requires safety management tools that promote loose coupling, flexibility, innovation, experimentation and discretion. As shown by the factor-ten case, this way of thinking does not capture organizational reality for two reasons. First, it disregards uncertainty in the organization of medicine. It disregards the fact that stability or change and predictability or unpredictability often cannot be presupposed at any given time because of the time-dependent and uncertain character of safety work and clinical practice; mundane and routinized tasks can quickly become emergencies and, as the case of the factor-ten error shows, what seem to be rather stable and linear processes can suddenly turn into unsafe situations. Second, the separation arguments risk disregarding the interconnectedness and mutual dependency of stability and change. The dualistic nature of the argument undermines situations in which change or variation enable stability as well as those in which stability enables change; it neglects the way in which 'change gives meaning to permanence and recurrence makes novelty possible' (Dewey 1925: 47). This is not new to safety literature, and it has been shown, for instance, that variation in terms of risk taking as well as learning through failure and trial-and-error can foster safety and stability (Wildavsky 1991). Safety II's quest to embrace performance variation by studying the way 'care is delivered so well, so often, under difficult and varying conditions' (Braithwaite et al. 2015: 420; see also Mesman 2008) is, in itself, based on the realization that variance-inducing processes are often the basis of stable and reliable outcomes. Conversely, we must also challenge the oft-uttered idea that while stability can provide short-term advantages in terms of, for instance, efficiency, it creates a rigid system that is largely incompatible with change. As noted by Farjoun, organization theory is full of examples of cases in which 'adaptability is supported by a considerable amount of structure and a number of stable mechanisms, as well as a surprising degree of formalization and strict control' (2010: 211). In line with this, Holmes (2009) has suggested that emergency nurses are able to act promptly, efficiently and innovatively exactly because of their strict adherence to rules and protocols in emergency situations: It is the stability of rules, habits and routines that provides them with an 'artificial cool head'

(Holmes 2009: 302), prevents them from overconcentration, helps them coordinate their responses and, not least, alerts them to unintended complications (see also Chap. 8). This comes interestingly close to Dewey's notion of habits which is exactly based on the insight that, oftentimes, variance-inducing outcomes rely on variance-reducing processes. In a description of how intelligent habits and training enable a violin player to play his violin both skilfully and creatively, Dewey argues that '[m]echanism is indispensable. If each act has to be consciously searched for at the moment and intentionally performed, execution is painful and the product is clumsy and halting' (Dewey 1922: 71).

When we look at the factor-ten medication error to discuss, not the causes of the incident, but the reason that it was averted, both standardization and resilience explanations seem to have difficulties addressing the nurse's life-saving reaction, exactly as a case in which stability and routine are the preconditions for flexible and prompt action when needed. In the RCA process, the issue was never discussed. Although the main 'root causes' of the incident were defined in terms of 'lack of experience', because of which depending on experience was proclaimed to be the main dilemma of the case, it was never discussed that it was exactly the nurse's experience and routines in her handling of chemotherapy that prevented the incident from having serious or even fatal consequences. From the perspective of Safety II, the picture is more unclear. On the one hand, resilience engineers argue that we need to attend to what goes right rather than what goes wrong, in order, among other things, to become more aware of the necessity of performance variability and not treat healthcare professionals as 'fallible machines' (Hollnagel et al. 2013: 8). On the other hand, there seems to be an inbuilt scepticism towards experience, routine and habits in the resilience perspective, which is expressed in different ways. First, it is an oft-repeated message that in a constantly changing and complex world, we cannot rely on our past experiences:

> We are consequently constrained to look at the future in the light of the past. In this way our experience or understanding of what has happened inevitably colours our anticipation and preparation for what could go wrong and thereby holds back the requisite imagination that is so essential for safety. (Hollnagel et al. 2006: 2)

This argument resembles Karl Weick's advice that to remain safety-conscious in a constantly changing environment, people should 'drop their tools', i.e., their overlearned habits, skills and earlier experiences, and instead improvise, innovate and be creative 'bricoleurs' in the moment (Weick 2001, 2007). But returning to the factor-ten error, the nurse's reaction was not an improvisation based on her ability to drop tools; it was rather based on her ability to *apply* tools: namely, the tools of routine, training and experience in mixing chemotherapy medication for children.

Second, when Perrow's situated arguments are universalized and errors are understood in general to result from the complex interplay of systemic components, individual (or team-based) decision-making is not necessarily of significance to the outcome of actions:

> It is just as wrong to attribute successes to careful planning and diligence as it is to attribute failures to incompetence or error. Instead, both owe their occurrence to a mostly unpredictable, but not unimaginable, combination of a number of system characteristics. (Hollnagel et al. 2013: xxiv)

Thus, it is argued that in a complex and fluctuating system such as the healthcare system, the time span and influence of experiences, habits and decision-making are short lived and, consequently, that system safety is the better way forward. But this argument misses the point that the 'success' of the nurse's reaction was exactly based on diligence and attentiveness. The nurse's realization that the mixture was slightly too red was based on her accumulated experience of similar cases; it came about because of her safety dispositions or 'intelligent habits'.

In the last two chapters of the book, I sketch out the conjectures of a pragmatic stance on patient safety in which safety dispositions and intelligent habits are understood as the preconditions for the delivery of safe care exactly because stability and change, habits and reflexivity, rules and flexibility are thoroughly interconnected traits of organization—and because the relation between these traits cannot be predetermined as certain in situated and developing clinical situations.

Notes

1. Parts of this chapter have been published in *Sociology of Health and Illness* (Pedersen 2016).
2. Cited from H.W. Gehman (2003) *Columbia Accident Investigation Board: Report* (Vol. 1), Washington, DC: U.S. Government, p. 203.

References

Allen, D., Braithwaite, J., Sandall, J., & Waring, J. (2016). Towards a sociology of healthcare safety and quality. *Sociology of Health and Illness, 38*(2), 181–197.

Aspden, P., Wolcott, J., Bootman, J. L., & Cronenwett, L. R. (Eds.). (2006). *Preventing medication errors*. Medication Errors, Institute of Medicine. Washington, DC: The National Academies Press.

Bosch, S. J., & Wears, R. L. (2013). Resilience engineering: A better way of approaching patient safety? *Edra Connections, 1*, 7–9.

Braithwaite, J., Wears, R. L., & Hollnagel, E. (2015). Resilient health care: Turning patient safety on its head. *International Journal for Quality in Healthcare, 27*(5), 418–420.

Cohen, M. D. (2007). Reading Dewey: Reflections on the study of routine. *Organization Studies, 28*(05), 773–786.

Dekker, S. (2011). *Drift into failure: From hunting broken components to understanding complex systems*. Burlington, VT and London: Ashgate Publishing Ltd.

Department of Health. (2000). *An organisation with a memory: Expert group report*. London: Department of Health.

Dewey, J. (1917). Duality and dualism. *The Journal of Philosophy, Psychology and Scientific Methods, 14*(18), 491–493.

Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York: Promentheus Books.

Dewey, J. (1925/1958). *Experience and nature*. Reprint 1958. New York: Dover Publications.

Du Gay, P., & Vikkelsø, S. (2012). Reflections: On the lost specification of 'change'. *Journal of Change Management, 12*(2), 121–143.

Farjoun, M. (2010). Beyond dualism: Stability and change as a duality. *Academy of Management Review, 35*(2), 202–225.

Feldman, M. S., & Pentland, B. T. (2003). Re-conceptualizing routines as a source of flexibility and change. *Administrative Science Quarterly, 48*, 94–118.

Hale, A. (2014). Foundations of safety science: A postscript. *Safety Science, 67*, 64–69.

Harris, F. (2007). Dewey's concepts of stability and precariousness in his philosophy of education. *Education and Culture, 23*(1), 38–54.

Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics, 4*, 1–23.

Hollnagel, E. (2006). Resilience: The challenge of the unstable. In E. Hollnagel, D. D. Woods, & N. Leveson (Eds.), *Resilience engineering: Concepts and precepts* (pp. 9–17). London: Ashgate Publishing Ltd.

Hollnagel, E. (2012a). *FRAM: The Functional Resonance Analysis Method: Modelling complex socio-technical systems*. Surrey, London: Ashgate Publishing Ltd.

Hollnagel, E. (2012b). Coping with complexity: Past, present and future. *Cognition, Technology & Work, 14*, 199–205.

Hollnagel, E., Braithwaite, J., & Wears, R. (Eds.). (2013). *Resilient health care*. Surrey, London: Ashgate Publishing Ltd.

Hollnagel, E., Wears, R., & Braithwaite, J. (2015). *From Safety-I to Safety-II: A white paper*. The Resilient Health Care Net, Published by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia.

Hollnagel, E., Woods, D. D., & Leveson, N. (2006). *Resilience engineering: Concepts and precepts*. London: Ashgate Publishing Ltd.

Holmes, S. (2009). In case of emergency: Misunderstanding tradeoffs in the war on terror. *California Law Review, 92*(2), 301–356.

Iedema, R., & Carroll, K. (2011). The "clinalyst": Institutionalizing reflexive space to realize safety and flexible systematization in health care. *Journal of Organizational Change Management, 24*(2), 175–190.

Institute for Healthcare Improvement. (2017). *The next wave of patient safety*. Podcast featuring Derek Freeley and Donald Berwick. January 26. Retrieved from http://www.ihi.org/resources/Pages/AudioandVideo/WIHI_NextWave_of_Patient_Safety.aspx

Jeffcott, S., Ibrahim, J., & Cameron, P. (2009). Resilience in healthcare and clinical handover. *Quality and Safety in Health Care, 18*, 256–260.

Jensen, C. B. (2008). Sociology, systems and (patient) safety: Knowledge translation in healthcare policy. *Sociology of Health & Illness, 30*(2), 309–324.

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To err is human: Building a safer health system*. Committee on Quality of Healthcare in America, Institute of Medicine. Washington, DC: National Academy Press.

Lesar, T. S. (2002). Tenfold medication dose prescribing errors. *The Annals of Pharmacotherapy, 36*(12), 1833–1839.

Levinthal, D. A., & Rerup, C. (2006). Crossing an apparent chasm: Bridging mindful and less-mindful perspectives on organizational learning. *Organization Science, 17*, 502–513.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*, 71–87.

Mesman, J. (2008). *Uncertainty and medical innovation: Experienced pioneers in neonatal care*. Basingstoke, UK: Palgrave Macmillan.

Mintzberg, H. (1983). *Structure in fives: Designing effective organizations*. Engelwood Cliffs, NJ: Prentice-Hall.

Nemeth, C., Wears, R., Woods, D., et al. (2008). Minding the gaps: Creating resilience in health care. In K. Henriksen, J. B. Battles, M. A. Keyes, et al. (Eds.) *Advances in patient safety: New directions and alternative approaches* (Vol. 3: Performance and Tools). Rockville, MD: Agency for Healthcare Research and Quality

Pedersen, K. Z. (2016). Standardization or resilience? The paradox of stability and change in patient safety. *Sociology of Health and Illness, 38*(7), 1180–1193.

Perrow, C. (1972/1979). *Complex organizations: A critical essay* (2nd ed.). New York: McGraw-Hill Publishers.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.

Sheps, S. B., & Cardiff, K. (2011). Patient safety: A wake-up call. *Clinical Governance: An International Journal, 16*(2), 148–158.

Sutcliffe, K. M., Sitkin, S. B., & Browning, L. D. (2004). Tailoring process management to situational requirements: Beyond the control and exploration dichotomy. In M. L. Tushman & P. Anderson (Eds.), *Managing strategic innovation and change* (pp. 178–191). New York: Oxford University Press.

Timmermans, S., & Berg, M. (2003). *The gold standard: The challenge of evidence-based medicine and standardization in healthcare*. Philadelphia: Temple University Press.

Vaughan, D. (1996). *The challenger launch decision, risky technology, culture and deviance at NASA*. Chicago: University of Chicago Press.

Walker, J., & Cooper, M. (2011). Genealogies of resilience: From systems ecology to the political economy of crisis adaptation. *Security Dialogue, 42*(2), 143–160.

Waring, J. (2009). Constructing and re-constructing narratives of patient safety. *Social Science & Medicine, 69*(9), 1722–1731.

Waring, J., Allen, D., Braithwaite, J., & Sandall, J. (2016). Healthcare quality and safety: A review of policy, practice and research. *Sociology of Health and Illness, 38*, 198–215.

Weick, K. E. (2001). *Making sense of the organization*. Boston, MA: Blackwell Publishing.

Weick, K. E. (2007). Drop your tools: On reconfiguring management education. *Journal of Management Education, 31*(1), 5–16.

Weick, K. E., & Quinn, R. E. (1999). Organizational change and development. *Annual Review of Psychology, 50*, 361–386.

Weick, K. E., & Sutcliffe, K. M. (2007). *Managing the unexpected: Resilient performance in an age of uncertainty* (2nd ed.). San Francisco: Jossey-Bass, Wiley.

Wildavsky, A. (1991). *Searching for safety*. New Brunswick, NJ: Transaction.

Zuiderent-Jerak, T. (2007). Preventing implementation: Exploring interventions with standardization in healthcare. *Science as Culture, 16*(3), 311–329.

Zuiderent-Jerak, T. (2015). *Situated intervention: Sociological experiments in healthcare*. Cambridge, MA: The MIT Press.

Zuiderent-Jerak, T., & Berg, M. (2010). The sociology of quality and safety in healthcare: Studying a movement and moving sociology. In C. E. Bird, P. Conrad, A. M. Fremont, & S. Timmermans (Eds.), *The handbook of medical sociology* (6th ed., pp. 324–340). Nashville, TN: Vanderbilt University Press.

Part III

8

A Pragmatic Stance on Safety Management

Approaching patient safety with a pragmatic stance means adopting an empirical, non-dogmatic and non-dichotomizing attitude to organizing safety. To convey a pragmatic stance is to acknowledge that medical knowledge and safety knowledge is situated and time-dependent and that any general proposition, standard or safety technology must be weighed in relation to concrete clinical situations. Thus, any act of safety management must always start with and in the clinical situation. Taking the point of departure in the situation and acknowledging safety knowledge as pragmatic and situation-based involves what Actor Network Theory inspired by American pragmatism has called a principle of generalized symmetry (see, for instance, Callon 1986; Latour 1987). That is, it involves an explorative attitude to the situation at hand where distinctions and tensions are not predetermined as *a priori* dichotomies, but spring from empirical analysis.

Practical reasoning in general and Dewey's pragmatism specifically have traditionally been seen as ways to overcome the tendency to dichotomize. Dewey's concepts such as situation, habit and transaction are all ways of overcoming traditional dichotomies between human and environment, body and mind, change and stability, and thinking and

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7_8

acting. The philosophical dichotomies that Dewey fights have been reproduced in the social sciences, and in Perrow's *Complex Organizations* (1972) he highlights—and seeks to go beyond—the structure/actor, routine/non-routine and rules/non-rules dichotomies of organization theory. As I have shown in this book, similar distinctions are duplicated in contemporary patient safety thinking through divisions between standardization and flexibility, simplicity and complexity, system and human, and blame and non-blame. In many alternatives to the current patient safety programme, there is a tendency to substitute one side of a dicotomy with the other. Even the more situated attitudes do not always escape the dichotomizing tendency as they also tend to divide organizational reality into bits that are either stable and in need of standards or changing and in need of flexibility. Yet, in concrete situations, such tensions do not necessarily exist, and it might well be the most stable and routinized practices that turn out to also be the most flexible (see Chap. 7).

In Jessica Mesman's work on the treatment processes in neonatal care, she describes how taking point of departure in the particular clinical situation means being in an 'in-between zone'—or opening up 'the interface between'—generally established dichotomies such as 'the general and the particular; actors and technologies; formal protocols and the swirl of treatment trajectories; public and local accountability; facts and values; expectations and experiences' (2008: 188). When in need of safety management, whether of the proactive or reactive kind, it must always be remembered that this complex 'mess' cannot be ordered in advance. When approaching critical incidents, for instance, it cannot be determined beforehand whether responsibility or blame should be appointed. Or whether the organizational set-up was inappropriate (for instance, highly coupled or complex). Or whether the situation was routine or was hectic and uncertain. Determining these matters and determining what is to be done (if anything) is a question of pragmatic and practical reasoning based on the skills, competences and experiences of those engaged in the process.

In this chapter, I consult three scholars, Stephen Holmes, John Law and Jessica Mesman, who each delivers an important alternative to

mainstream safety thinking that escapes dichotomization. These are alternatives that treat medicine, and the practice of safety within medicine, as a thoroughly practical endeavour defined by its dependence of pragmatic rules and routines, clinical experience and practical judgement. Each in their own way these scholars address issues of safety management with a situation-based and pragmatic attitude; and with a view to the importance of already existing routines, rules and practices as a precondition for giving way to flexibility and discretion when needed. These are authors, then, who use quite different conceptualizations to introduce strikingly analogous arguments. I define these three approaches as representing, in different ways, a pragmatic stance to safety management. I end the chapter by suggesting the following three axioms, or rules of thumb, for approaching patient safety management with a pragmatic attitude in concrete clinical situations:

1. Take point of departure in the clinical situation.
2. Be cautious about ideals of risk elimination through system optimization.
3. Preserve the importance of training, habits and experiences.

These are axioms that summarize the attitude to patient safety management that has been developed throughout the book and that is supported by the presented pragmatic alternatives to mainstream safety thinking.

Stephen Holmes on Rules in Emergency Responses

In an article on national security emergencies, Stephen Holmes attends to emergency-room personnel in hospitals and their strict adherence to rules and protocols in emergency situations. Holmes argues that, although the personnel do 'understand the need for immediate and unhesitating action' (Holmes 2009: 302), they nonetheless 'routinely consume precious time to follow protocols drilled into them and practiced in advance'

(2009: 302). This is done for safety reasons, he argues; it is done to provide them with 'a kind of artificial "cool head"', which can 'minimize the risk of making fatal-but-avoidable mistakes under the psychologically flustering pressures of the moment' (2009: 302). Holmes sums up his argument thus:

> [E]mergency-response personnel follow pre-established protocols precisely *because* they understand the dangers they face. Only those who fail to appreciate the gravity of a looming threat would advocate a wholesale dispensing with rules that professionals have developed over time to reduce the error rate of rapid-fire choices made as crises unfold. (2009: 303)

Importantly, Holmes's argument does not apply to those rules that prevent one from responding appropriately to the requirements of the situation. What Holmes refers to, then, is rather the auxiliary precautions that have stood the test of time and that it would be unwise or even unsafe to circumvent. It is the

> rules, protocols, practices, and institutions […] that have survived through trial and error to help them [the emergency responders] of the complexity of their threat environment, to prevent their over-concentration on a single salient danger, to alert them to unintended complications triggered by our own ad hoc remedial interventions, and to bring their potentially fatal mistakes to light before it becomes too late to correct them. (2009: 308)

Holmes's argument is fundamentally different from the typical variation critique of the standardization approach for a number of reasons. First, the defence of rules is not driven by a wish to reduce variation and assure the same treatment for all; rather, it is a question of permitting 'emergency workers, with no time to think, to coordinate their responses swiftly and effectively' (Holmes 2009: 310–311). Therefore, the rules and protocols Holmes advocates are of a particular kind; these protocols are 'practised in advance', they are 'drilled into' the personnel and they are 'developed over time' and 'through trial and error'. Interestingly, Holmes argues that such situated and practice-based rules might well be non-negotiable, without thereby being abstracted, universal or dogmatic. An

example, he states, is obligatory handwashing in the emergency room. This particular rule is practical, based on empirical observations and, as such, the 'rule is rigid but nevertheless pragmatic, neither dogmatic nor moralistic' (2009: 309). Holmes concludes that 'when crafted over time by emergency responders who have learned from their mistakes, non-negotiable rules can sometimes prove more effective, pragmatic, and adaptive than unregulated and unmonitored discretion' (2009: 311). In this way, Holmes's argument is not only at odds with the typical standardization approach, but also, and perhaps primarily, with the idea that discretion and flexibility, in and of themselves, can function as safeguards in times of unpredictability, insecurity and change. With Holmes's approach, rules, habits and routines are necessary, especially in unsettled situations.

> Rules to be followed 'in case of emergency' reflect a realistic understanding that a crew of human responders, with no script to follow, often *fail* to adapt themselves with desirable rapidity and coordination to the demands of a dangerous and confusing situation. (Holmes 2009: 308)

It is now obvious that although Holme's case on emergency response is not far from Weick's discussion on the Mann Gulch disaster (2001) discussed in Chap. 7, his line of argument is radically different. While Weick argues against relying on routine and 'doing things by the book' and highlights instead the need for 'dropping one's tools' (of rationality, earlier experiences and rules) in order to improvise, Holmes takes the opposite position and maintains that dropping rules, tools and scripts in cases of emergency often prevents rapid and flexible responses.

Holmes is obviously well aware that not all emergencies are alike and that only some emergency situations are best managed by non-negotiable rules, while others should be dealt with through the combination of rules and discretion that the particular situation calls for. He therefore stresses that the emergency-room analogy and the general argument that 'in the emergency room, urgency is the principal reason for avoiding discretion and relying on rules' (Holmes 2009: 307) should be understood as an 'antidote' to the analogies and metaphors of the 'advocates of unbounded executive discretion' (2009: 311).

On the most general note, the paper is an acknowledgement that rules, internalized scripts and well-established routines are not antithetical to flexible and prompt action in complex and insecure situations (see also Du Gay 2000; Perrow 1972). Here the fact that Holmes speaks of emergency care situations often characterized by uncertainty, unpredictability and rapid change is particularly interesting, as the usual claim in much organization studies literature and as utilized by the resilience approach is that, while bureaucratic structures are well suited in stable and predictable settings, rules and regulations must be discounted in times of insecurity, complexity and rapid change. Following Holmes's argument, it is, however, precisely in such situations that we must rely on rules, scripts, careful training, routines and habits, rather than on 'unbounded discretion' or 'ad hoc interventions' that might increase error rates, slow us down and restrict our focus. But these are not just any rules or protocols; they have been developed over time through 'trial and error' and through practice. They are the rules that are 'drilled into' the personnel, and those that are empirical, pragmatic and situation-based. They are rules that have, in Dewey's terms, become intelligent habits.

John Law on Relative Stability in Failing Systems

In sociologist and leading science and technology scholar John Law's paper 'Ladbroke Grove: Or How to Think of Failing Systems' (2000), another pragmatic stance on safety management is presented. The paper is a thorough description of a UK train crash that killed 31 people and injured more than 500, as well as a discussion of the inquiry that followed. In the formal investigation that followed the disaster, which in many respects was not unlike an root cause analysis (RCA), the main focus was on answering the question as to why the driver of the train passed through a red signal. In going over the given answers, Law finds the explanation strategies used and solutions suggested insufficient. A number of what Law determines as regional cases (i.e., root causes) were identified: A technical error concerning a bell that might have indicated to the driver that the signal was green

although it was not; a number of traditional 'human factors' that could have affected the driver's possibility of seeing the red signal (e.g., illumination by the sun and occlusion causing visual problems); and lastly both organizational culture and poor management were identified as possible causes for the incident. John Law argues how most of these causes are interconnected, so that, for instance, managerial responsibility is located 'behind' the signal visibility problems. However, he suggests, 'in these movements between pigeon-holes the buck may stop nowhere in particular', thus representing what has been a main critique of incident-analysis methodologies. It is said about the RCA, for instance, that '[w]hat you call "root cause" is simply the place you stop looking any further' (Dekker 2006: 77). And, as noted by Rasmussen (1999), this particular 'cause' is likely to be one for which a cure is already known.

Apart from regional and local causes, systemic explanation models are also invoked in the aftermath of the train crash. Such arguments are based on what within safety engineering can be coined as a Safety II logic (e.g., Hollnagel et al. 2015) offering explanations based on 'emergence' and 'the primacy of the relational' while specifically accounting for 'breakdown that cannot be located in—that specifically fail[s] to fit with—a spatiality of region or locality' (Law 2000: 5). System stories, Law argues, insist that elements (a competent or less competent driver for instance) have attributes in virtue of their location in the system and from this perspective the solution to safety problems is usually a call for increased coordination and overall system design. As described in Chap. 7, this is not unlike some of the Safety II measures of recent patient safety thinking. To Law, systemic explanations and answers run into problems because they also (like the regional answers) presuppose stability and the possibility of oversight of systems; the relational argument is 'an argument that works best if relations are held stable' (Law 2000: 6).

Although in important ways opposite, the regional and the relational explanation model, Safety I and II answers, equally intend to solve the problem of failing systems by making them failsafe. From a regional perspective new safety devices and procedures are suggested, while the relational solution calls for 'overall control of the railway system, an overall design, overall coherence and overall responsibility' (Law 2000: 7); i.e., it calls for a strong coordinating centre that keeps the relations in the system

stable. As described in Chap. 7, Safety I and II answers alike tend in this way to presuppose certainty.

While Law appreciates that both failsafe procedures and strong centres can be useful, he sustains that 'sometimes, perhaps often, they simply don't work' (Law 2000: 8). As for the failsafe procedures, Law's argument is in line with Perrow's argument from *Normal Accidents* as he notices that '[a]dding complexity to the relations which make up a system in order to strengthen those relations may actually dissolve those relations in practice' (Law 2000: 9). The earlier-mentioned bell that indicated to the driver that the light was green is an example of a safety procedure (a so-called Driver Reminder Appliance) that was most likely a contributing cause for the accident, just as the numerous safety checks in the case of chemotherapy production presented in Chap. 7 were a contributing factor for its unsafe outcome. But the call for strong centres of the systems approach also runs into difficulties. Law identifies a large number of diversities in the British railway industry: a collection of such a variety of different parties and interests that it becomes impossible to talk about one system with a single centre. Moreover, Law argues, if coherence and stability are possible in this arrangement, it will always only be partial and relative. Because while the railway system is a relatively stable arrangement with elements that stay more or less in place, they only do so most of the time—not all the time. The system is not always stable or coherent. Systems fail.

While it is perhaps not controversial to argue that it is only possible to achieve partial coherence and relative stability, it is more unusual to insist that this imperfection is not necessarily a problem and that we should not strive for failsafe perfection—especially in the aftermath of an accident that caused more than 30 deaths. And it is an even bolder move to argue that imperfection is an advantage. Law foregrounds what he determines as the advantages of 'working in a way that is fluid' (Law 2000: 11) and argues that 'the partial disorder of these not very coherent arrangements does just fine a good deal if not all of the time' (Law 2000: 10). Importantly, while fluidity and incoherence might rhetorically resemble Safety II arguments, Law's understanding of fluidity and partial ordering is not based on a dichotomy of stability and change but displays a subtle understanding of the relations between

routines and flexibility, for instance, in what he determines as 'the prevailing practices' of the people working in the railways; i.e., the practices that have developed over time and for good reasons and that are indispensable for getting work done—even when they clash with formal procedures. For instance, he describes how it had become 'generally accepted' (Law 2000: 13) among the signalmen that a so-called SPAD (a signal to indicate that a train has passed a danger sign) did not entail that every train was immediately put on hold as the formal procedure would command. Instead, the signalmen would wait for a little while to ensure that the signal should indeed be reacted on. The reason being that most SPADs were normally corrected immediately or turned out to be of a technical character, and only very few were actual runaway trains. If all SPADs were reacted on instantaneously, it would result in injuries caused by emergency braking as well as disruptions and delays. Law concludes:

> If the prevailing practice of the signalmen across the network was in fact to 'wait and see', then this was a system imperfection which actually helped to keep the wheels turning almost all of the time. Or, more generally, fluidity and system imperfection are necessary if systems are to run at all. They are not simply chronic failures. They are built into the hidden logic of the systems. (Law 2000: 14–15)

Thus, these practices have been necessary to make the railway system function. Failure to, for instance, follow guidelines and standards is thus not a question of 'sloppiness', dangerous disorder or 'drift into failure' (Vaughan 1996; Dekker 2011) but rather the practices needed to bring relative stability to an imperfect system. Our common reaction to disaster, however, is to seek out such system imperfections as part of or the main cause of the problem:

> After a disaster everyone is troubled and defensive. When they are asked: was everything done by the book? Did you have control over everything in the way you were supposed to? They respond defensively. This means that partial (in)coherences are downplayed, or treated as errors. But this also loses or marginalises the practices routinely needed for working on and within partially coherent systems. Indeed, it renders them

> illegitimate. Makes them look sloppy. Dangerously fluid. The issue, then, is how to render legitimate the practices of multiple, partial ordering. (Law 2000: 14)

If partial ordering, system imperfection and the prevailing practice are not the problem, what is? Law ends his tale in a spirit not far from Perrow's waring about the creation of certain types of complex and tightly coupled organizations (1984). He indicates that the persistent demands of ever-higher speed on the railways and evermore trains coupled with a marked-oriented management approach had resulted in a contracted-out and fragmented railway operation, thereby creating a system that was equally more tightly coupled and more interactively complex. On top of this, Law identifies an interventionist tendency: 'the sense that new technologies might—often should—be introduced' (Law 2000: 15). Such uncritical celebration of change risks devaluating the practices that have developed over time and that have proved valuable in securing, for instance, the needed slack in the system.

> The argument is that change is not a good in and of itself. There are also reasons for relative stability. And, in particular, there are reasons for relative stability in safety-critical contexts where routines have proved workable in the past. (…) To put it simply: bureaucracies don't deal with change, but, contrary to the popular view, they may be flexible and tolerant of error if the demands placed upon them are relatively stable. (Law 2000: 15)

Like Holmes (2009) and Perrow (1972), then, Law reminds us that stability, slowly developed routine and bureaucracy are not necessarily hindrances to flexible organizing, but often preconditions for it.

John Law's argument is important not only because it indicates the dangers of failsafe visions, interventionist optimism and the quest for certainty (whether from a Safety I or II approach), and not only because it highlights the significance of relative stability and established routines, but also because it is a brave argument. Law announces that although a serious accident occurs, it is not necessarily fruitful to rush out and try to 'solve' the problem by reducing all system imperfections. Because systems are not perfect. And striving to make them so can make things worse.

As such, 'the search for system perfection is not only impossible but, more strongly, it may be self-defeating' (Law 2000: 14). This argument is in line with Perrow's reasoning in *Normal Accident* (1984). If one general recommendation can be taken from this classic work, it is to 'stop trying to fix the systems in ways that only make them riskier' (Perrow 1984: 4).

Jessica Mesman on Acts of 'Exnovation'

Jessica Mesman's work on patient safety delivers a third pragmatic and situated attitude to safety management through a particular focus on the routines and competences vital for maintaining safety in healthcare. In her work, Mesman asks not why error happens, but rather why they do not happen more often. In this way, she turns our attention towards the already established practices and their potential safety advantages, and she argues that the one-sided focus on causes and prevention of critical incidents and mishaps of contemporary safety management risks ignoring the importance of identifying the strengths of these sound and safe practices (Mesman 2008, 2009, 2011; Iedema et al. 2013; see also Baxter et al. 2015). Thoroughly founded on empirical analysis, Mesman takes important steps towards reconceptualizing and reinventing healthcare improvement and innovation concepts and practices in order to make visible and leave room for these already existent safety practices in improvement processes. This is done through new analytical constructions, such as the concept of exnovation as an alternative to innovation. As well as through engagement with new methodological tools such as video-based improvement tools—so-called video-reflexive ethnography—used to map the 'in situ' production of safety in clinical situations and thereby to support improvement practices 'from within' (Iedema et al. 2013).

Mesman's book *Uncertainty in Medical Innovation: Experienced Pioneers in Neonatal Care* (2008) is based on ethnographic studies conducted in a neonatal care clinic in a Dutch hospital. Here, she highlights how a complex coordination of competences, skills, experiences, routines, teamwork, technology and organizational systems is needed to secure the delivery of safe care. In this coordination process, where

there is no clear dividing line between 'the known and the unknown, the risk and responsibility, and the collective and the individual' (Mesman 2008: 188), typical processes of technological innovation do not only lead to new treatment opportunities and reduction of risk, but also to new types of uncertainties, dilemmas and unintended consequences.

Mesman uses the concept of 'exnovation' to foreground the resources, competences and skills of the clinician and the clinical team, which, although often unarticulated, constitute an essential part of the organization of safety in healthcare[1]:

> Exnovation pays attention to the mundane, to the implicit local routines, to what is already in place. […] More than innovation, exnovation does justice to the creativity and experience of the clinicians, in their effort to assert themselves in the particular dynamic of the practice they are involved in. (Mesman 2011: 76)

The difference between exnovation and innovation in this quote captures part of the difference between a more pragmatic approach and the interventionism of both Safety I and Safety II. Accordingly, safety is not achieved through innovation, but through focusing specifically on the strengths of the current ways of organizing, of the already established practices and routines and then to let this focus suggest ways forward. Such exercises often draw attention to the routines, skills and competences of clinicians and medical teams as a precondition for stability but also for creativity and resilience. Furthermore, they draw attention to the less transparent parts of healthcare, that is, to the importance of the mundane, implicit local routines, invisible work, hidden competences and the strengths of practices. Hereby, the limits of formal regulations and safety systems become obvious:

> [A]n exnovation of hidden competences reveals not only the complexities of treatment trajectories and the resourcefulness of the actors involved, but also the limited power of medical technology and formal protocols and regulations to ensure the continuity of medical intervention. (Mesman 2008: 6)

Safety science, and especially the advocates of the resilience perspective on safety, Safety II, has adopted the rhetoric of focusing on strengths rather than on errors, problems and weaknesses. It is argued that while Safety I defines safety as a condition where 'as few things as possible go wrong', Safety II defines it as a condition where 'as many things as possible go right' (Hollnagel et al. 2015: 4).

As attested to in Chap. 4 of this book, there are numerous reasons for defending practices of attending and reacting to 'that which go wrong' in medical practice. Within the medical community, practices of detecting, defining, categorizing, punishing or forgiving errors and mistakes serve crucial purposes, not least in drawing and defining the limits of office and of proper conduct, in educating clinicians technically and morally—and in improving practices through learning, experience and sometimes even blame and self-blame. From this perspective, it does not make sense to talk about safe treatment and care without attending to the limits of what can be determined as such. These are limits that are often internally set, relative to concrete clinical situations and somewhat elastic but nonetheless crucial to the practice of medicine and the safety of patients. But although Mesman's rhetoric can be somewhat dichotomizing when she, for instance, argues for skipping the 'deficiency model of safety' or for going from addressing 'causes of weaknesses' to 'causes of strengths' (Mesman 2009: 1705), her work is much more subtle than the engineering perspective. By attending to 'the complexities of human decision-making in the face of uncertainty' (Mesman 2008: 4) and by foregrounding and describing in detail all the hidden safety work that is already taking place in medical practices, Mesman's book should not so much, I believe, be read as an objection to the focus on error management in present patient safety work, but rather as an objection to the tendency of innovating, implementing and optimizing safety systems in healthcare without acknowledging the complex web of experiences, competences, coordination and practices that are already there securing the delivering of safe care almost all of the time. Like Law's analysis of the 'prevailing practices' that creates relative stability in imperfect systems, Mesman delivers fine-grained analyses of the actions and knowledge needed to secure the safe delivery of treatment and care, and she suggests that improvement practices should always start from here.

A Pragmatic Stance in Three Axioms

Holmes's suggestion that existing routines, rules and procedures that have stood the test of time are indispensable in emergency situations, Law's case on the prevailing practices of the signalmen and the necessity of accepting and even appreciating system imperfections, and Mesman's suggestion to attend to exnovation, existing competences and sources of strengths when organizing for and seeking to understand safety are all, I suggest, pointing towards a pragmatic stance on safety management. Taken together with the previously presented representatives of practical and pragmatic reasoning, as well as the empirical cases analysed throughout the book, the contour of such a stance can be summarized in three axioms or 'rules of thumbs' that present the pragmatic attitude to patient safety and are meant to function as advice to anyone who engages in safety improvement efforts in concrete clinical situations.

1. *Take point of departure in the clinical situation*

> Instruction in what to do next can never come from an infinite goal, which for us is bound to be empty. It can be derived only from the study of deficiencies, irregularities and possibilities of the actual situation. (Dewey 1922: 289)

Practising safety is part of practising medicine. It is a practical and context-dependent enterprise that is not separable from the clinical situation as such. Hence, safety knowledge is circumstantial just like medical knowledge; it is fallible, time-dependent and situated. In concrete clinical situations, safety is rarely reflected upon as a separate trait of the situation; it is rather approached as an implicit part of practising medicine. Sometimes, however, particular clinical situations demand that safety issues be addressed more directly in order to decide what is safe and unsafe in the situation and act accordingly. In such safety-critical situations, employment of practical reasoning allows general rules, procedures, earlier experiences and other kinds of knowledge to be applied with regard to the specificities of the situation. Safety management must, in these cases,

necessarily be a practical enterprise in which 'agents must always look at what is appropriate in each case as it happens' (Aristotle 2000: 25, 1104a).

This kind of reasoning is not necessarily directly applicable to other situations or settings. Moreover, because of the fallibility of medical knowledge and the imperfection of the healthcare system, it might be that the 'safe solutions' reached by competent reasoning will later turn out to be mistaken (Paget 1988). From a pragmatic stance, any standard, checklist, guideline or procedure should be understood as a proposition 'adapted to the exigencies of particular cases' (Dewey 1916: 171). Or, as Jessica Mesman explains,

> [w]orkable rules are *codified experiences*. Guidelines can only offer a hold when they are integrally linked to the practice. […] This implies that guidelines should leave room for adjustments based on experiences in practice. (Mesman 2008: 193–194)

Needless to say, this advice goes for safety interventions of all kinds as well; it is always necessary to ask whether they make sense in the specific situation.

This is not, however, to say that a pragmatic stance on patient safety must discount all the important practical findings of safety research. Yet it must treat them as exactly that: practical findings that need to be tested as to their fitness and usefulness in particular situations. Hence, being situation-based and pragmatic does not exclude 'transmitted learning' in some form; safety efforts can easily be 'directed by' others' experiences and best practices—it might even, as Holmes has argued, consist of non-negotiable rules about, for instance, hand hygiene, and still be empirically based rather than abstract or dogmatic. But just because medical emergency teams, safe communication tools or other safety technologies have proved useful in other industries, other countries or other healthcare sectors, we cannot automatically presume that they are useful in a particular hospital, a specific ward or in relation to the concrete clinical situation at hand. As such, safety procedures or technologies should always be treated as 'measures to try'; they are, to recall Dewey's argument about the physician's use of procedures, 'standpoints from which to carry on investigation' (Dewey 1916: 171). In line with this argument, Mesman describes how treatment

processes consist of a constant evaluation of knowledge, guidelines and practices, according to their concrete usefulness: 'Time and time again, the value of the available knowledge has to be weighed, or it has to be decided which guidelines apply or which perspective is most valuable' (Mesman 2008: 188). As a result of that weighing, procedures that turn out to be 'worse than useless' must be discounted (Dewey 1916: 172).

Newer studies on standardization, especially within Science and Technology Studies, have addressed the need for an alternative way of approaching the use of standards, guidelines and rules in healthcare. Interestingly, some of the studies that argue for a situated separation of healthcare practices (see Chap. 7) also posit a more non-dichotomizing and developing approach to improvement practices. Timmerman and Berg, for instance, opt for the possibility of flexibility being built into the standards and argue that '[f]lexibility implies that the system is not more detailed than required, nor more stringent than necessary, nor more imperative than usable' (2003: 211). In line with Dewey (1922), and with more recent work on the flexibility of organizational routines (Feldman and Pentland 2003; Cohen 2007), this implies that a standard can be revisited and adapted whenever new local demands or new types of evidence suggest the need for such adaption: 'A standardized protocol's strength depends on the extent that the tool allows for deviation and improvisation' (Timmermans and Berg 2003: 211). A more pragmatic understanding of the relationship between standards and flexibility is also detectable in Zuiderent-Jerak's work on 'situated standardization', where he introduces 'a more processual understanding' of standards, guidelines and quality improvements in healthcare (Zuiderent-Jerak 2007: 326). From Zuiderent-Jerak's perspective, standards are not to be 'implemented' but must instead be continuously developed and locally renegotiated (Zuiderent-Jerak 2015: 92). This echoes with Mesman's concept of exnovation (2008) and with Iedema, Mesman and Carroll's notion of 'innovation from within' (2013). By presenting us with a processual, time-dependent and adaptable concept of standardization, alternative reflections on standards like the ones presented here can pave the way for a more pragmatic stance on safety management that takes its point of departure in the clinical situation and challenges the dominant quest for certainty.

2. *Be cautious about ideals of risk elimination through system optimization*

In John Law's paper on the Ladbroke Grove accident, he shows how the common reaction to errors and accidents is to introduce change with the intention of creating more perfect systems. In this process, he argues, there is a risk that what is already in place and functioning is ignored or, even worse, made illegitimate. He therefore concludes that 'change is not a good in and of itself' (Law 2000: 15). Other voices evoked throughout the book have uttered similar concerns: Most noticeably, Perrow warns against the idea that safety problems can be solved by adding new procedures or safety innovations, which can increase coupling and complexity of organization (Perrow 1984). Mesman argues that 'good intentions and a gamut of data or guidelines can never really preclude problems from occurring' (Mesman 2008: 188). And, as several of the empirical cases have shown, there is a good chance that when trying to solve certain problems or diminish one type of risk, other problems and risks are likely to appear. Dewey supports this argument in its most general form, with the statement that 'as special problems are resolved, new ones tend to emerge. There is no such thing as a final settlement, because every settlement introduces the conditions of some degree of a new unsettling' (Dewey 1938: 35). This is a general argument that is linked to the situated and fallible status of knowledge claims, and as medical knowledge is particularly fallible and uncertain because it involves individual patients, the idea that we can create failsafe healthcare institutions through a highly interventionist attitude based on an illusion of certainty is problematic.

At this point, my earlier discussions on practical reasoning and the subtle relationship between individual judgements in specific cases and the rules, propositions and earlier experiences that guide such judgements should be evoked. In Jonsen and Toulmin's account of casuistry, they dispute the dominant tendency to introduce new rules in cases of errors or misconduct and instead argue for the better use of the rules we already have:

> [W]hat is called for […] is not multiplication of further rules the inflexible application of which will only end creating still more hard cases. Surely the issue is rather one for the exercise of wisdom, discretion, and discernment

> in enforcing the rules we already have. In morality, as in law and public administration, the assumption that all practical decisions need to rest on a sufficiently clear and general system of invariable rules or principles has, from a theoretical point of view, a certain attractiveness. But in the actual business of dealing with particular real-life cases and situations, such rules and principles can never take us more than part of the way. The real-life application of moral, legal, and administrative rules calls always for the exercise of human perceptiveness and discernment—what has traditionally been referred to as 'equity'—and the more problematic the situations become, the greater is the need for such discernment. (Jonsen and Toulmin 1988: 9)

This quote can be read as a critical comment to both the standardization and resilience approaches to safety: to Safety I's search for closing holes in systems via the introduction of new standards and safety fixes; but also to Safety II's suspicion towards existing practices and appreciation of innovation, improvisation and intervention represented in extreme in Karl Weick's 'non-logical' position (2007), where he dismisses old ways, rules and experiences in order to improvise and innovate when faced with safety problems. Johnson and Toulmin's argument is different from these positions: When faced with problems, the best solution is not necessarily to radically change what we do or to introduce new rules, procedures or centralized interventions. Sometimes already established rules and practices are adequate, that is, if one uses discretion in the interpretation of them and does not treat them as universal, unchangeable or dogmatic. This argument is supported by Dewey, who, as quoted earlier, maintains that 'the choice is not between throwing away rules previously developed and sticking obstinately by them. The intelligent alternative is to revise, adapt, expand and alter them' (Dewey 1922: 239–240).

The idea from a pragmatic stance, then, is that instead of immediately introducing new rules, systemic innovations or centralized managerial solutions whenever we experience an error, a critical incident or an accident, it might be enough to look at the rules, procedures, practices and routines that are already in place (formal or informal), as well as to our ability, skill and competence in acting with the flexibility and discretion needed to enforce these rules in a pragmatic and adaptable way.

When approaching, for instance, emergency procedures from this perspective, it is necessary to look at the existing practices at ward level before introducing centralized emergency teams, and when approaching problems of incompetence or misconduct, it is necessary to take into account the existing structures of co-collegial error management before implementing blame-free processes. Jessica Mesman's use of the term 'exnovation' expresses such an attitude, which marks a difference to current managerial efforts' excessive focus on innovation and intervention by which the more invisible structures of well-functioning routines and practices risk being disregarded. She argues that 'where innovation can be defined as "to make something new", exnovation pays attention to what is already in place and challenges the dominant trend to discard existing practices' (Mesman 2008: 5).

This attitude also implies that, in some instances, the obvious consequence of critical incidents or medical error is to do nothing (in terms of new interventions). However, as Law indicates in his analysis of the Ladbroke Grove disaster, this is a difficult argument to maintain—especially if people are hurt or even killed. Doing nothing in terms of system optimizations, action plans or new safety protocols is not, however, the same as ignoring the incident. Instead, processes of formal or informal incident analysis can function as possibilities for taking responsibility for what went wrong, generate learning experiences for the people involved and result in willingness of the involved personnel to modify their future responses.

Today, a less interventionist position is hardly an easy position to hold, and it does not make it easier that patient safety representatives, quality coordinators and risk managers have become part of a distinct profession within healthcare. For a profession eager to maintain its position and worth by 'innovating' healthcare, advice such as 'do nothing' or 'use the rules already in place with more discretion' is, for obvious reasons, not preferable compared with a more interventionist position. The problem, however, of the interventionist faith in failsafe systems is not only that it is unattainable. The problem is that striving towards system perfection can make systems more unsafe. Clever safety management therefore means accepting that systems can fail and that so can management efforts. As argued by Law, 'the art of management is that of accepting some failures by wisely choosing which to try to put right' (2000: 11).

3. *Preserve the importance of training, habits and experiences*

In present safety management efforts, training and experience are deemed 'weak safety solutions' because they are—it is argued—informed by a reliance on human variability and hence fallibility. Likewise, in recent calls for resilience, existing practices and routines are often considered useless and potentially damaging because, it is argued, practices based on the past are less useful in dealing with the new: with uncertainty, change and complexity.

Throughout this book, I have presented a different stance in which the importance of habits, experience and training has been marked as highly significant for delivering safe healthcare. Let us once more take a look at the medical emergency team case presented in Chap. 5. With the introduction of this new safety initiative, the already established and (for the most part) well-functioning emergency routines at ward level were not taken into account although—as Holmes argues—the 'training, disciplining, and coordinating the behaviour of front-line emergency responders' (2009: 308) is especially important in times of emergency and uncertainty. Here Perrow's claim (1972) that rules in terms of well-established practices and professional skills are likely to be reduced by standardization is suggestive; when the standardized teams are introduced, the routines that had been developed over time, through trial and error, and situated in a specific environment are threatened, at least temporarily, until new slowly internalized and routinized practices take their place.

The focus on habits and routines also reminds us that we cannot be alert all the time. In some safety literature, especially within the resilience tradition, constant alertness, preparedness and attentiveness are presumed to be a necessity for safe organizing in times of uncertainty and change. It is essential to 'check all necessary conditions and to take nothing important for granted' (Woods and Hollnagel 2006: 3). However, as Holmes's paper shows, such ideals are neither possible nor preferable in emergency situations, where sufficient and effective responses mean that everybody cannot check everything—and that some things need to be routinized (and in this way 'taken for granted'). As Dewey argues, we need habits in order to act skilfully and creatively. If not, the result is like

that of an untrained violin player: The 'execution is painful and the product is clumsy and halting' (Dewey 1922: 71).

Take also the factor-ten medical error presented in Chap. 7; here, attention to the competences, experiences and established habits and routines could, one would expect, have made a difference had it been discussed during the subsequent RCA. In this case, the call for a 'positive' approach that looks for strengths and not only for weaknesses could have revealed how and especially why the error was discovered and the risk of inflicting harm averted by the experienced nurse before drug administration. In light of this, it would have been more difficult to maintain—as it was done in the RCA sessions—that the reliance on experience was the root cause of the incident as it created unreliability, variability and instilled chance in the system. It would have been equally difficult to determine routines and experiences as inflexible 'old ways' from a Safety II perspective. Rather, these qualities spring forth as essential safeguards when organizing for safety. Experience, here implying routine, training and practice in working with chemotherapy for children, was the precondition for the nurse acting out of the ordinary by using her intelligent habits and discretionary capacities to prevent the error from escalating. And similarly, experience and routine were the reason for the mixer's suspicion that something was not right—a suspicion which could have averted the incident much earlier in the process.

Dewey's use of the term 'habit' captures the important elements of the argument here. The suggestion that we '*know how* by means of our habits' (Dewey 1922: 92), the example of the man who needs to learn how to stand straight and Mauss's story of the English troops that had not learned how to dig with French spades (Mauss 1934) are all illustrative. Delivering safe care is, with this attitude, a matter of training: It is a matter of growing habits and 'muscle knowledge' that enables the clinician to act in certain ways. Framed as such, it can be useful to think of safety as a predisposition, comportment, an attitude or an ability that instigates certain '*ways* or modes of response' (Dewey 1922: 42). Interestingly, the authors evoked throughout this book put forward related arguments. For instance, Perrow speaks of professionals as 'personnel who have complex rules built into them' (Perrow 1972: 26), while Holmes speaks of rules that are 'drilled into' the emergency personnel (Holmes 2009: 302).

The term 'safety dispositions' can be used to describe these internalized habits and ways of response in relation to securing the safe delivery of care to patients. Such dispositions need to be learnt and trained, and therefore safety is inseparable from the daily training and practices of clinicians. The training of safety dispositions is part of what Fox describes as 'training for uncertainty': the transformation and work on the self that clinicians must undergo in order to face up to the fact that their actions might cause patients harm and to steel themselves for failure and uncertainty while acting with (a kind of) certainty in relation to the patient.

Dewey adds a further dimension to this concept of habits: namely, the distinction between intelligent and unintelligent habits, that is, on the one hand, those habits that are a result of earlier reflective experience and inquiry and, on the other, those that are pure 'thoughtless' routines. In other words, it is the difference between acting in a certain way and repeating certain acts (Dewey 1922). Although unmistakably aware that we need both kinds of habits, Dewey argues for the importance of intelligent habits for our ability to think, inquire and draw on earlier experiences. Within this line of reasoning, the interesting choice is not necessarily between 'reason and habit' (Dewey 1922: 77), or between discretion and routine, flexibility and rules, or the like; instead, it becomes imperative to question what kinds of habits, routines and rules health professionals are internalizing. How to form habits that support critical inquiry into uncertain and unsettled cases; competent, swift and concentrated actions in cases of emergency; and honest disclosure of failure and bold self-examination in cases of medical mistakes? In the concluding chapter of this book, I suggest how a rethinking of patient safety education and training and a revitalization of medicine as a moral practice can lead us some of the way.

Notes

1. Jessica Mesman was inspired to use the concept of exnovation by R. Wilde's 'Innovating Innovation: A Contribution to the Philosophy of the Future', keynote at *Policy Agendas for Sustainable Technological Innovation*. London, December 1, 2000.

References

Aristotle. (2000). *Nicomachean ethics* (R. Crisp, Ed.). Port Chester, NY: Cambridge University Press.

Baxter, R., Taylor, N., Kellar, I., & Lawton, R. (2015). Learning from positively deviant wards to improve patient safety: An observational study protocol. *BMJ Open, 5*, e009650. doi:10.1136/bmjopen-2015-009650.

Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of St. Brieuc Bay. In J. Law (Ed.), *Power, action and belief: A new sociology of knowledge* (pp. 196–233). London: Routledge & Kegan Paul.

Cohen, M. D. (2007). Reading Dewey: Reflections on the study of routine. *Organization Studies, 28*(05), 773–786.

Dekker, S. (2006). *The field guide to understanding human error*. London: Ashgate Publishing Ltd.

Dekker, S. (2011). *Drift into failure: From hunting broken components to understanding complex systems*. Burlington, VT and London: Ashgate Publishing Ltd.

Dewey, J. (1916/1966). *Democracy and education: An introduction to the philosophy of education* (1st paperback ed.). New York: The Free Press.

Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York: Promentheus Books.

Dewey, J. (1938). *Logic: The theory of inquiry*. New York: Henry Holt & Co.

Du Gay, P. (2000). *In praise of bureaucracy: Weber, organization, ethics*. London: Sage.

Feldman, M. S., & Pentland, B. T. (2003). Re-conceptualizing routines as a source of flexibility and change. *Administrative Science Quarterly, 48*, 94–118.

Hollnagel, E., Wears, R., & Braithwaite, J. (2015). *From Safety-I to Safety-II: A white paper*. The Resilient Health Care Net, Published by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia.

Holmes, S. (2009). In case of emergency: Misunderstanding tradeoffs in the war on terror. *California Law Review, 92*(2), 301–356.

Iedema, R., Mesman, J., & Carroll, K. (2013). *Visualising health care improvement: Innovation from within*. Oxford, UK: Radcliffe.

Jonsen, A. R., & Toulmin, S. (1988). *The abuse of casuistry: A history of moral reasoning*. Berkeley: University of California Press.

Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Milton Keynes: Open University Press.

Law, J. (2000). *Ladbroke Grove: Or how to think about failing systems*. Centre for Science Studies, Lancaster University, UK. Retrieved June 29, 2013, from http://www.comp.lancs.ac.uk/sociology/papers/Law-Ladbroke-Grove-Failing-Systems.pdf

Mauss, M. (1934). Techniques of the body (B. Brewster, Trans. 1973). *Economy and Society, 2*(1), 70–88.

Mesman, J. (2008). *Uncertainty and medical innovation: Experienced pioneers in neonatal care*. Basingstoke, UK: Palgrave Macmillan.

Mesman, J. (2009). The geography of patient safety: A topical analysis of sterility. *Social Science & Medicine, 69*(9), 1705–1712.

Mesman, J. (2011). Resources of strength: An exnovation of hidden competences to preserve patient safety. In E. Rowley & J. Waring (Eds.), *A sociocultural perspective on patient safety* (pp. 71–94). London: Ashgate Publishing Ltd.

Paget, M. (1988). *The unity of mistake: A phenomenological interpretation of medical work*. Philadelphia: Temple University Press.

Perrow, C. (1972/1979). *Complex organizations: A critical essay* (2nd ed.). New York: McGraw-Hill Publishers.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.

Rasmussen, J. (1999). The concept of human error: Is it useful for the design of safe systems? *Safety Science Monitor*. Special Edition: Philosophy of Safety 3, article 1.

Timmermans, S., & Berg, M. (2003). *The gold standard: The challenge of evidence-based medicine and standardization in healthcare*. Philadelphia: Temple University Press.

Vaughan, D. (1996). *The challenger launch decision, risky technology, culture and deviance at NASA*. Chicago: University of Chicago Press.

Weick, K. E. (2001). *Making sense of the organization*. Boston, MA: Blackwell Publishing.

Weick, K. E. (2007). Drop your tools: On reconfiguring management education. *Journal of Management Education, 31*(1), 5–16.

Woods, D., & Hollnagel, E. (2006). Prologue: Resilience engineering concepts. In E. Hollnagel, D. D. Woods, & N. Leveson (Eds.), *Resilience engineering: Concepts and precepts* (pp. 1–7). London: Ashgate Publishing Ltd.

Zuiderent-Jerak, T. (2007). Preventing implementation: Exploring interventions with standardization in healthcare. *Science as Culture, 16*(3), 311–329.

Zuiderent-Jerak, T. (2015). *Situated intervention: Sociological experiments in healthcare*. Cambridge, MA: The MIT Press.

9

Patient Safety as Trained Dispositions and Moral Education

Throughout this book's presented empirical cases and practical analyses, it has become apparent that safety is not only about the creation of safe systems, but just as importantly about the training and nurturing of safety dispositions and practical reasoning in healthcare practices. Remember the syringe case, where the valuable safety routine of checking the label on the medication was jeopardized by the introduction of oral syringes (Chap. 2); the emergency team case, where gradually developed safety routines, rules and habits were overruled by the implementation of a more centralized system for optimizing emergency responses (Chap. 5); the extrauterine pregnancy, where important intuitions and 'muscle knowledge' about possible misdiagnosis were dismissed because everything 'looked fine on paper' (Chap. 6); and the factor-ten medication error, which was only averted because of an experienced nurse's great skill and routine in handling chemotherapy for children (Chap. 7). Each case points to the skills, routines, intelligent habits, existing practices and accumulated experiences as significant but underdetermined elements of ensuring safety in clinical situations and care delivery processes. In the quest to system-optimize healthcare, the pragmatic practices and safety disposition of health professionals are not only undermined but also often likely to be discharged with.

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7_9

I have developed the concept of safety dispositions to account for these trained abilities, intelligent habits, experience-based intuitions and practical types of reasoning of clinicians which are often the precondition for patient safety understood equally as that which goes right and the ability to detect and act when something goes wrong. I have attended to these dispositions not as an alternative to systems thinking, standards and clever design, and not as a new paradigm of safety management, but as that which current forms of organizing healthcare quality and safety are in risk of ignoring or neglecting. By a strong faith in failsafe systems, a distrust in 'the human condition', an unhindered interventionist optimism and an often naive positivistic approach to medical and safety knowledge, the conditions for training, maintaining, correcting and regulating safety dispositions and practical types of knowledge are less than optimal.

In this concluding chapter, I address the prevailing but pertinent question about how to regain focus on, training of and appreciation for safety dispositions in our healthcare systems. There is no general, single or easy answer to this question. However, there is an obvious place to start: with the education and training of health professionals. The curriculum in medical and nursing schools and the practical training in the clinic to become a doctor or a nurse are natural first places to intervene if we wish to support processes of developing pragmatic attitudes to patient safety based on sound safety dispositions and practical reasoning. In the remainder of the chapter, I therefore discuss the patient safety curriculum in medical schools and address the need to get 'uncertainty' and practical knowledge formally into the education of medical students. I discuss possible ways of training and modifying safety dispositions in the clinic. And I conclude by reflecting on the importance of addressing medical education as moral education and medical conduct as moral conduct, and to allow for regulation of conduct—also through approval and disapproval—in order to inculcate responsibility, modify safety dispositions continuously and thereby affect future acts. I begin the chapter by a short summary of the book's stance on the practical and experience-based types of knowledge that make up safety dispositions.

Practical Knowledge and Safety Dispositions

In a paper on the constitutional historian Herbert Storing, I stumbled over a particularly well-formed definition that summarizes what sets practical forms of knowledge apart from more 'systemic' kinds of knowledge (see also Chap. 3). First, practical knowledge is an understanding that is acquired by undertaking an activity over a longer period of time.

> The subtle nuances and complex interactions among materials, people, and settings acquired by master artisans and craftsman through a long period of 'hands-on' experience exemplify this kind of tacit knowledge. (Morgan et al. 2010: 630)

The slowly accumulated experiences and skills within a particular field provide the 'expert' with the ability to make decisions and act during emergencies, in abnormal cases or 'under conditions of limited resources, short time frames, significant uncertainty, and political conflicts that often make systematic analysis impossible' (Morgan et al. 2010: 630). This category includes the inculcated, slowly trained and internalized rules and procedures needed in emergency situations, of which Holmes speaks (2009), and the routines, clinical experiences and skill needed for health professionals to succeed in 'acting promptly and adequately in situations of uncertainty and doubt' (2008: 8) that Mesman enquires into.

A second feature of practical knowledge is that it involves 'a feel for the whole'—and the development of 'a sense of proportion among priorities, and of balancing competing demands' (Morgan et al. 2010: 630). It is the ability that Dewey refers to as 'good sense' with clear proximity to Aristotle's *phronesis*:

> Sagacity is power to discriminate the factors that are relevant and important in significance in given situations; it is power of discernment; in a proverbial phrase, the ability to tell a hawk from a hernshaw [heron], chalk from cheese, and to bring the discriminations made to bear upon what is to be done and what is to be abstained from. (Dewey 1938: 61)

Thus, practical knowledge refers to the clinician's trained ability to compare, describe and interpret cases, symptoms and personal stories, to infer from guidelines to specific clinical situations and back again, to use rules with disconcertment and to make clinical judgements and discretionary choices of action, even when knowledge is uncertain, impartial or unstable.

Third, practical knowledge concerns a certain 'sixth sense' or a particular type of critical knowledge 'that gives skilled practitioners a sense of when things are not quite right, or do not add up. In these situations, their judgments often run against perceived facts and guiding principles' (Morgan et al. 2010: 630). This is the type of critical knowledge, or 'muscle knowledge' (Dewey 1922), that in the case of the misdiagnosed pregnant woman made an attending physician walk around with 'wrinkles in his forehead' and a non-verbal feeling that although everything looked fine on paper, something was not quite as it should be. Or it is the hunch of the mixer in the chemotherapy production process that the mixtures were too strong for a child. In these cases, practical knowledge, and what I determine as safety dispositions, ran counter to the 'facts' of the case. For various reasons including lack of slack, busyness and safety procedures that gave a false sense of security, the 'facts' of the case in both instances ended up overruling the safety dispositions of the health professionals. Thus, the experience-based intuitions, habits and dispositions of the health professionals were not reacted on and inquired into and in both cases this nearly had fatal consequences for the patient in question.

Here it is also useful to recall Dewey's concept of habits. By understanding habits as predispositions to act, or as a readiness to respond in particular ways to problems or context-specific situations, Dewey understands habits not only as mechanical repetitions but also as active and adaptable; they are arts involving 'skill of sensory and motor organs, cunning or craft, and objective materials' as well as 'order, discipline, and manifest technique' (1922: 15). Moreover, habits to Dewey are physical, like walking and standing straight, but they are equally mental as it is habits that guide our thoughts and enable us to think and inquire into the problems and uncertain situations we encounter. From this perspective the disposition to react on critical knowledge is a habit we need to develop.

There are no easy, simple and readily implementable answers to the question of how to support the development and maintenance of practical reasoning and safety dispositions in medicine in general. And, unfortunately, the dominant safety and error management solutions given within mainstream patient safety thinking are likely to make the preservation of such dispositions worse, not better. As implied in Jerak-Zuiderent's distinction between 'certain unsafety' and 'uncertain safety' (2012), the programme's faith in failsafe systems and its fight against variation through the enforcement of standardized knowledge have serious 'unsafe' consequences for practical clinical decision-making and the 'lived and located judgement' that is the basis of safe care in concrete situations (Jerak-Zuiderent 2012: 16). At the same time, an attitude that takes account of uncertainty and the possibility of error—an 'uncertain safety' approach—is often more likely to accommodate safety (2012: 16–17).

The problem of predetermining certainty in health system design is, as described in Chap. 7, even present in some of the more situated approaches to safety management when these are based on the idea that well-defined parts of healthcare can be organized to give space to intuitions and responses of health professionals through, for instance, timeouts, reflexive spaces and red stickers to express doubt. Although such solutions can prove an important step in refocusing attention to safety dispositions and their worth, not least in identifying system breakdowns, the situated approach supports the illusion of certainty if it imagines parts of healthcare organization where practical knowledge and pragmatic attitudes are *not* important for the safe delivery of care. With the dichotomy between stability and change, it risks neglecting that practical knowledge is important for keeping things 'running' all of the time, and for noticing and reacting to emergencies, insecurities, abnormal cases also, or perhaps especially, in instances where that which apparently seems routine, linear, standardized and simple turns out uncertain and unstable.

It is therefore not enough, I propose, to design spaces of reflectivity. And what is more, it is dangerous not to attend to all that which makes such reflexivity possible; to all that which supports the development of intelligent and experience-based habits; and to that which trains, maintains and regulates the health professionals' discretionary abilities, power

of discernment and critical sense. I therefore now turn to the important question of medical training and education in medical schools and in the clinic, as some of the places in which the habits of reflexivity, discretion and the development of a critical sense are founded.

The Patient Safety Curriculum in Medical Schools

In Rene Fox's study 'Training for Uncertainty' (1957), she describes how medical students in their early years of training get acquainted with the uncertainty of medical knowledge and their own inadequacy through a culture in which doubt is praised. Later, through education, hard training and work on the self, the clinicians learn how to act with the inherent uncertainty of medical practice and foster a necessary 'manner of certitude' (Fox 1957: 227) that enables them to commit to their clinical judgements and act decisively on behalf of their patients while also bearing the ever-present possibility of error in mind (see Chap. 4).

This compares with the way the ethical norm of non-maleficence has been taught in medical schools for centuries. Not as a principle, but as a reminder of the need for sound clinical judgement and of the fact that all clinical activity carries the possibility of harm and medical error (Brewin 1994; Smith 2005).

Evidently, this type of 'training for uncertainty' is still part of the practical elements of medical training in the clinic, where uncertainty, doubt and the need for pragmatic adaptation and practical knowledge in linking biomedical evidence and personal illness stories or in making decisions based on partial information is all inevitably part of the clinical situation. It is much less evident, however, whether curriculums at medical schools support this training and allow for the culture of doubting of which Fox spoke (1957). Rather, uncertainty and doubt seem alarmingly absent. Judged from the content of course descriptions of the largest Danish medical school, references to medical knowledge as something that is not only strictly scientific but also uncertain, situated and practical are practically absent. Courses in clinical decision-making, patient safety and medical ethics treat medical knowledge as evidence-based, safety

knowledge as 'scientific' (understood here as highly reliable, linear, measurable and generalizable) and ethics as based on fundamental and imperative principles. In the obligatory 'Course in Patient Safety and Quality Development', the goal is to introduce students to the programmatic aspirations of the quality and safety agendas and to enable them to 'discuss basic methods of quality assurance and quality monitoring, including management and feedback, evidence-based medicine, clinical guidelines, improvement models, patient involvement, audit, surveys, indicators and statistical process control' (CU 2016). In relation to patient safety, the course strives to make the medical student familiar with dominants terms, goals and methodologies of the patient safety programme, including 'the concept of the human factor and how the work place should be designed and organized to minimize the risk of errors' (CU 2016). But there is no mention of discussions about how to relate evidence and cases, how to act with partial knowledge or how to choose between conflicting guidelines. And there is no mention of the limitations or unwanted consequences of introducing patient safety and quality methods, audits, surveys, indicators, monitoring, statistics and safety systems.

Courses in patient safety, like the one just described, are increasingly becoming an obligatory part of the curriculum in medical schools worldwide—and education is of late described as one of the main focus areas for the patient safety programme in the upcoming years (IHI 2017). To accelerate this trend, the WHO's World Alliance for Patient Safety has published the *WHO Patient Safety Curriculum Guide for Medical Schools* (2009a), a step-by-step guide to teachers and a comprehensive curriculum on patient safety topics focusing primarily on 'new areas of knowledge such as human factors, systems, root cause analysis and risk reduction' (Walton 2010: 553). In 2011, an inter-professional guide was presented (WHO 2011).

In this curriculum guide of more than 250 pages, the WHO introduces the requirements of the discipline of patient safety in strict accordance with, and through a sometimes worryingly simplified version of, the dominant assumptions of the patient safety programme as they have been laid out in this book. As expected, a main enemy here is blame, which is understood as 'one of the main constraints on the health system's

ability to manage risk' (WHO 2009a: 85). Therefore, the medical student needs to learn how to go from a blame culture to a learning culture through adopting a blame-free attitude and safety technologies from other high-risk industries; in short, '[i]t is crucial that students begin their vocation understanding the difference between blame and systems approaches' (WHO 2009b: 4). Linked to this, another dominant message is that medical students must be able to develop systems-thinking abilities. Healthcare is a complex system in which errors happen, it is argued, but in which humans are still the most unchangeable and unreliable part. Thus, it is maintained that while 'it is hard to change aspects of complex systems, it is harder to change the behaviour and thinking processes of human beings in terms of their contributions to errors' (WHO 2009a: 111). Therefore, medical students must learn to think as system engineers and act to reduce errors through system redesign.

Finally, the curriculum includes a strong advocacy for human factors' thinking, describing it as 'an established science' that uses 'evidence-based guidelines and principles to design' and that is led by a group of human factors' specialists indispensable in the design of the health system (WHO 2009a: 101). Here it is stated that humans are 'distractible'; that our minds 'play "tricks" on us by misperceiving the situation and thereby contribute to errors occurring'; that we make '"silly" mistakes—regardless of experience level, intelligence, motivation or vigilance' and finally that '[i]n simple terms, error is the downside of having a brain' (WHO 2009a: 102). We are therefore, quite simply, in need of failsafe machines:

> Human beings are not machines; machines, when maintained, are on the whole very predictable and reliable. In fact, compared to machines, humans are unpredictable and unreliable, and our ability to process information is limited due to the capacity of our (working) memory. However, human beings are very creative, self-aware, imaginative and flexible in their thinking. (WHO 2009a: 102)

Accordingly, the message to medical students is something like this: 'Your imperfect brains make you fail regardless of your level of experience and training, therefore it is better to trust in machines, technologies and failsafe systems. Sometimes, however, complex systems such as health

systems fail too. In these instances you need to learn how to redesign these systems, because it is (again) easier to do so than to try to change humans.' So the solutions to human failure and system failure alike are systems thinking and system redesign. These arguments are, by the by, an exact reproduction of the arguments in the American Institute of Medicine classic on patient safety *To Err Is Human* (Kohn et al. 2000; see also Jensen 2008 and Chap. 3).

Practical Reasoning on the Curriculum

Although it is of course true that some errors happen because of human distractions and misconceptions, the messages delivered in the patient safety curriculum—to medical students around the world—are dangerous for several reasons. For one, and as I have shown throughout this book, systems and machines are not always predictable and reliable. Often 'failsafe' technologies, standardized safety procedures and electronic systems fail, are insufficient or have unwanted consequences for the situated practices of medicine. Here it is likely to be exactly the health professionals' practical abilities to work around, make pragmatic adaptations, use technologies and guidelines with discernment and react when something is going wrong that keep things 'running' and practices safe (see also Law 2000; Perrow 1984; Mesman 2008; Owen et al. 2009). So while machines are not always predictable and reliable, humans—or more specifically health professionals—are certainly not always unpredictable and unreliable. Rather, the celebrated flexibility and creativity of humans is based on 'stable' and reliable routinized practices, thoroughly trained skills, intelligent habits and the practical knowledge that comes with having experience within a particular field, and having done something many times before. Any human is not able to act creatively in a case of sudden problems during a standard surgical procedure; a highly skilled and experienced surgeon is. And any human is not able to act promptly in emergency situations, but a thoroughly trained emergency nurse is.

Therefore, the WHO curriculum guide is not only problematic because it refrains from describing the importance of safety dispositions and

practical reasoning needed in securing safe care and the necessity of inculcating such habits and reasoning in daily work practices, but also because blind faith in standardization, failsafe systems and technological fixes contains an accompanying risk of slowly and unnoticeably undermining and devaluating the health professionals' safeguarding thoroughly trained bodily and discretionary dispositions.

One could therefore wish for a more pragmatic attitude to teaching patient safety in medical schools. One that addresses uncertainty not as a condition that can be discharged with by introducing predictable and reliable machines, systems and evident-based knowledge, but rather as a possibility of every clinical situation and therefore as something that medical students must learn and train how to deal with in the best possible way. This includes the development of habits of revisiting decisions of for instance diagnosis, if new facts of the case put them in doubt, or habits of listening to intuitions and hunts—and allowing oneself to inquire into these—when something does not quite add up. This also includes spending time on rehearsing and internalizing important bodily and mental techniques and modes of acting. And it means allowing oneself to deviate from clinical guidelines or safety procedures when these are not delivering the optimal solution in the concrete clinical situation. In Dewey's words, when guidelines, procedures and standards 'come between him [the physician or researcher] and the situation in which he has to act, they are worse than useless' (Dewey 1916: 172).

Obviously, safety dispositions are not something that can be learnt and trained in the classroom, but it is not unlikely that the seeds for the development of a pragmatic attitude can be planted in the classroom if the curriculum allows for a more comprehensive description of medical work, the developmental and situated nature of such work and the practical type of reasoning that supports it. This should sit alongside training in understanding and detecting various types of errors, mistakes, mishaps, slips and systemic failure, as well as cases of incompetence and malpractice and the multiple causes for these. Here, students should be presented to the fact that there is, as Rosenthal argues, often no easy way to set these different types of errors apart: i.e., 'there is no clear-cut way to distinguish between accidents, mishaps, mistakes, errors' (1995: 37). Such difficulties

make the training and development of skill in making this type of distinctions and in acting accordingly all the more important—not least in cases of malpractice. Thus, students should be taught that their professional office as nurses or doctors are largely defined and legitimized by exactly the quality of their internal professional practices for error detection and medical self-regulation.

All this is of course not to say that students should *not* learn about systemic failure or about how to improve the contextual, technological and institutional conditions under which they work. It is important that they are taught about the complex organization of wider health systems and complicated issues of coordination, accountability and distributed agency related to these systems. Here it would be useful for them to become acquainted with the specific dangers of working in complex and tightly coupled systems (Perrow 1984), as well as with 'best practice' or 'positive deviance' (Baxter 2015) cases for how to—if possible—reduce such complexities and couplings through reorganization. But such an understanding of health systems should only be considered as one component of safety, when safety is approached as a delicate combination of elements such as skills, practical knowledge, trained routines, thoroughly rehearsed teamwork, patient involvement, discretionary elements, critical sense and intuition, as well as properly working systems and technologies.

Training and Modifying Safety Dispositions in the Clinic

While the message that humans fail because of their imperfect brains and their unchangeable 'human condition' is highly problematic in medical schools, it can have severe unwanted effects when imported into the clinic as a principle of safety management. Taken seriously, the perspective fundamentally distrusts the health professionals' ability to learn and to modify their habits and conduct continuously, and, as such, it challenges one of the most important foundations for the delivery of safe care (see Chap. 6). In the WHO curriculum guide, an example from the clinic is used to

illustrate the problem of the 'human mind' and to argue for the need of 'machines' instead:

> Consider a medical student taking blood from a patient. As the student is in the process of cleaning up after taking the blood, a patient in a neighbouring bed calls out for assistance. The student stops what she is doing and goes to help and forgets that the blood tubes are not labelled, which the student forgets when she returns to collect the tubes. (WHO 2009a: 102)

Let us stay with this example for a while to imagine possible solutions to the problem of the labelling of tubes. It is implied in the guide that, because of the risk of distraction, a safety solution should be designed that makes it impossible for the medical student to fail. The guide does not give its own 'failsafe' solution to the problem, but the idea would be to develop some kind of technical or systemic arrangement that secures the labelling of the tubes, regardless of any irregular conduct of the health professional. It is difficult to imagine a failsafe fix to this particular problem, and as the oral syringe case in Chap. 2 showed, the implementation of technical solutions is, as any organizational change, likely to have unintended consequences in terms of redistributions of tasks, risks and responsibilities. Yet, the most important problem of the incident with the missing labels is that when patient safety management is understood though a failsafe systems perspective, the distracted medical student is taken out of the equation. Thus, when approaching the incident as an opportunity for system redesign, a crucial fact is neglected: Becoming a clinician is about inculcating particular modes of action, discretionary habits and bodily techniques, including a large number of important safety routines, such as labelling the blood tubes at a particular point in the process of blood administration or checking the medication before it is administered to a patient. In Holmes's paper on emergency-room personnel in hospitals (2009), he argues that routines and protocols that have stood the test of time, been developed through trial and error and been drilled into the health professionals reduce their risk of being distracted, misinterpret situations and overconcentrate on a single issue. Here the message is that by inculcating particular modes of action, we

can change 'the human condition' and reduce the possibility of human factors error as well as other types of error. Such inculcation is a vital part of the training to become a professional within a particular field.

So although the patient safety programme deems training a weak safety solution because it does not eliminate the possibility of error, training is, from a pragmatic stance, the most obvious way to deal with the problem of the hypothetical case of missing labels. Rather than inventing a new safety system, it is likely that in most clinics there are already well-functioning practical rules, and probably also written protocols, for the labelling of blood samples. The need then is not necessarily for new rules, but rather that the rules already in place are properly trained in. The solution might simply be that the medical student trains and internalizes the proper conduct in relation to handling blood samples which will then reduce the likelihood of attention slips.

This is of course not to say that organization and design should not be considered. Labelling blood samples, administering medication, operating knees or delivering a critical diagnosis to a patient are all specialized tasks that are meticulously dependent on the design of the environment, the functioning of technological systems, the use of tools and devices and not least a close coordination and cooperation between the more technical and the more human elements. The importance of these sometimes specialized and complex but often mundane interactions—or what the late Dewey called transactions (Dewey and Bentley 1949)—is rarely noticed except in cases of organizational change where a new information technology (IT) system or a new safety initiative messes with the slowly developed infrastructure of connections between human and environment. In the case of the introduction of medical emergency teams, for instance, the ward's established human and technical infrastructure for dealing with emergencies, including routines for note-taking, telephone calls, teamwork and distribution of roles, became visible as soon as they were disrupted by the implementation of the new teams (see Chap. 5).

With a Deweyian stance, it can even be argued that habits and routines are 'done' by the environment as much as by the individual. Habits require 'the cooperation of organism and environment' (Dewey 1922: 14) and they are 'functions of the surroundings as truly as of a person'

(Dewey 1922: 14). We should laugh, Dewey argues, 'at any one who said that he was master of stone working, but that the arts was cooped up within himself and in no wise dependent upon support from objects and assistance from tools' (Dewey 1922: 15). From this perspective, talking about acts as owned exclusively by the individual becomes misleading. And it becomes impossible to think about developing or changing safety dispositions or securing patient safety from *either* a systems perspective *or* a human perspective.

Failsafe Fantasies

The failsafe vision is indeed tempting. It is appealing to imagine that no matter whether you meet an experienced, well-trained or competent health professional or an inexperienced, tired, stressed, clumsy or ill-prepared one, the system will keep you safe and eliminate the possibility of error. This vision is easily sold to the public who are accustomed to the typical anti-variation argument such as 'any patient must receive the same treatment no matter who is on call'. It is also convenient for politicians because it supports a general improvement and efficiency agenda, where increased pressure on health systems and personnel is addressed as a question of smarter and more optimized designs. And it has, perhaps surprisingly, even proven eatable to the health professions. Surprisingly, because the vision challenges their authority considerably, not least by making safety into something outside of their professional expertise and thereby paving the way for system engineers to become the new 'experts' on something that was earlier solely within the health professionals' jurisdiction. When health professionals do accept the programme, and often endorse it, there are several possible explanations. To name some, one concerns the programme's image and language of 'science' (see Chap. 3); a second that the alternative to human factors and systems thinking is understood to be even more malpractice claims and liability suits; and a third, for some at least, that safety and systems thinking as a discipline have led to the establishment of a new area of competence, even a new profession.

However, the failsafe vision is a fantasy; no matter how cleverly we design health systems and no matter how many failsafe systems we introduce, safe care is dependent on expertise and therefore it does matter who is on call—and it should matter. This book has further attested that although the failsafe vision is a fantasy, it has very real unwanted effects for the attention given to those on call, and the skills, discretionary abilities, practical knowledge and safety dispositions they need in order to deliver safe care and detect and avert unsafe situations. And it has unwanted consequences for the focus given to the delicate professional structures of detection and regulation of error and malpractice in clinical practice than was earlier identified as the foundation of safety management in healthcare (Bosk 2003; Rosenthal 1995). From this perspective, regulating error and discriminating between appropriate and inappropriate behaviour are part of the moral education of becoming a clinician and learning the rules and the limits of office.

Medicine as Moral Practice

It seems that the systems perspective on patient safety is here to stay. In recent years, safety engineers have challenged mainstream patient safety thinking's faith in stable and predictable systems and argued for complex and unpredictable systems instead. But the resilience engineers and their Safety II approach have not challenged the general faith in systems optimization; they understand patient safety as a safety science that is essentially to 'put knowledge into the world' through failsafe systems designs (Murphy et al. 2009; see also Braithwaite et al. 2015; Hollnagel et al. 2015). Although there is increasing focus on 'fair blame' and the need to balance accountability with learning (Timbs 2007; Khatri 2009; Dekker 2012), the dominant ideal is still that of non-blame, as this principle is understood to be the precondition for disclosure and reporting of errors in healthcare. As argued by the resilience advocates Sheps and Cardiff,

> [t]he re-emphasis on personal accountability in complex, dynamic and risky work environments […] is worrisome and may set the patient safety agenda back 20 years, and is unlikely to prevent patient harm. (2011: 152)

This echoes Woodward et al.'s line of reasoning, where the principle of non-blame is understood as so vital to patient safety that it must be maintained even when nuances are lost:

> Wholehearted adoption of the new paradigm will require an abandonment of the old, and its associations. A call for a blame-free culture is therefore more likely to be effective in breaking with the old ways than a more nuanced argument. (2009: 1293)

The rhetoric towards those who question these principles can sometimes be harsh. They might even be described as 'witch hunters' trying to pull healthcare back to 'the dark ages of blame and shame in medicine' (Woodward et al. 2009: 1293).

In this book, I have argued for the dangers of dogmatically pursuing these principles, as they are likely to interfere with the delicate structures for handling and regulating error within medical practice and with the training of safety dispositions and uses of practical types of reasoning in concrete clinical situations. It can even be held that the principle-based view of safety management challenges the understanding of medicine as a moral practice.

According to Dewey, moral can be defined as any kind of conscious valuation of alternative possibilities. This stance on moral 'saves us from the mistake which makes morality a separate department of life' (Dewey 1922: 279). Moreover, it determines morals as an ongoing achievement that entails revising one's judgements and acts based on the consequences of earlier actions: 'When we observe that morals is at home wherever considerations of the worse and better are involved, we are committed to noticing that morality is a continuing process not a fixed achievement' (Dewey 1922: 280).

The Deweyian notion entails that morals should be ascribed not only to persons but to actions and conduct. Yet the 'shared' element of conduct and the transactional relation between human and environment is not antithetical to addressing questions of character, dispositions and responsibility because the shared and embedded nature of human conduct does not exempt us from accountability:

> A human being is held accountable in order that he may learn not theoretically and academically but in such a way as to modify and—to some extent—remake this prior self. The question of whether he might when he acted have acted differently from the way in which he did act is irrelevant. The question is whether he is capable of acting differently *next* time; the practical importance of effecting changes in human character is what makes responsibility important. (Dewey 1932: 304)

In this way, Dewey's version of ethics is close to the Aristotelian notion of virtue. The assignment of responsibility, blame or forgiveness is about establishing conditions for learning, for the regulation of habits and therefore for the creation of 'better' persons (or clinicians) who are good judges of 'relative values' in concrete clinical situations:

> We may say, for short, that a person of sound judgment is one who, in the idiomatic phrase, has 'horse sense'; he is a good judge of *relative values*; he can estimate, appraise, evaluate, with tact and discernment. (Dewey 1933: 210)

This notion of ethics is also close to notions of casuistry or case-based reasoning where being a good clinician is a question of being a good casuist, that is, to be able to apply 'general rules to particular cases with discernment' whereas a bad casuist does 'the same thing sloppily' (Jonsen and Toulmin 1988: 16). Consequently, ethics become about fostering, training and internalizing those abilities, and no one, argue Jonsen and Toulmin, does so more consistently than the skilful doctor.

> [W]hen medicine is practiced conscientiously as well as skillfully, it becomes a prototypically *moral* enterprise. A doctor who diagnoses correctly and who prescribes successfully behaves meritoriously, nor merely because his actions are *effective* but equally because, given his relationship to the patient, these kinds of actions are *appropriate*: that is, they fulfill his *duty* as a physician—so much that one might even regard clinical practice as a 'special case' of moral conduct generally. (1988: 42)

With a practical and pragmatic stance, then, the better clinician is not he or she who follows guidelines or safety standards dogmatically or who

excels in systems thinking but he or she who is a good judge of relative values in particular instances; it is he or she who, when met with problems or uncertainties, is able to use procedures, guidelines, existing practices and earlier experiences with discernment and discretion; and it is he or she who engages in consistent work on the self to modify inappropriate habits.

To illustrate that morals, disclosure, learning and individual accountability *can* be combined in medical practice, let us recall Charles Bosk's study (1979/2003) of the internal regulation of error between residents and attending surgeons in a US hospital in the 1970s. Bosk found that approval, disapproval and taking responsibility for incidents and errors were all vital parts of the moral education of the residents. As the title *Forgive and Remember* indicates, both condemnation and forgiveness of different types of error inculcate responsibility in the resident, and demonstrate to him or her professional codes of conduct and the formal and informal limits of office. A crucial thing here is the hierarchical relation between attending physicians and residents—a relationship that is made possible within the institution of the clinical hospital, and through which both medical expertise and ethical attitudes are transmitted. In the so-called Mortality and Morbidity Conferences, such transmissions were particularly evident. Here the attendings would 'put on a hair shirt' and take full responsibility for mortality cases in order to show their subordinates the importance of disclosure, the appropriate amount of regret and self-blame, that medical practice is uncertain and that errors can happen to everyone—and lastly just how seriously they take their responsibility for the patients. In this way, the Mortality and Morbidity Conferences combine learning, disclosure and responsibility in a way impossible for the blame-free incident analysis methodologies of today (see Chap. 6; Iedema 2007; Mengis and Nicolini 2011).

Processes of co-collegial identification, control and regulation of misconduct; appointing and taking responsibility for things going wrong—and even blaming oneself and others; as well as forgiveness, understanding, restitution and learning from one's mistakes are all ideally constituents of a moral education of clinicians who must learn through training, trial, error and apprenticeship how to fulfil a particular type of office.

To approach, and to have a language to talk about, medical practice as a moral practice, and the training, nurturing and modifications of safety dispositions as moral education is an important step towards creating safer health organizations. And in this context, disapproval and approval, blame and forgiveness, disapprobation and approbation are all 'ways of influencing the formation of habits' (Dewey 1922: 121); they are ways of trying to influence 'the development of character and conduct' (Dewey 1922: 121) of the clinicians as a foundation for the delivery of safe care.

An Unsettled Settlement

> The 'settlement' of a particular situation by a particular inquiry is no guarantee that *that* settled conclusion will always remain settled. The attainment of settled beliefs is a progressive matter; there is no belief so settled as not to be exposed to further inquiry. […] In scientific inquiry, the criterion of what is taken to be settled, or to be knowledge, is being *so* settled that it is available as a resource in further inquiry. (Dewey 1938: 8–9)

Pragmatism is known for the close connection it instils between thinking, inquiring and acting, but it is a common misunderstanding that the quality or correctness of an inquiry is to be judged by the usefulness of its action. Rather, an inquiry is to be judged by its ability to enlighten and 'settle' the problem under scrutiny (Dewey 1941). And any such 'settlement' or judgement is situated in time and space, and 'individual' as in particular. Judgements have probability not certainty, and hence, 'the actions that are performed in consequence of accepting them are not logically *ex post facto*. […] They are operations that provide additional evidence, which confirms, weakens, or in some way modifies, the provisionally accepted appraisal' (Dewey 1938: 226).

To Dewey, inquiring is not a passive observational exercise instigated to reach some kind of detached objectivity but an activity by which we engage with the subject under scrutiny. Dewey foreshadows recent debates on performativity (e.g., MacKenzie et al. 2008) by holding the view that inquiry has 'formative' consequences insofar as 'new formal properties accrue to subject-matter in virtue of its subjection to certain

types of operation' (Dewey 1938: 101). With reference to the practice of law, he describes how 'formal conceptions arise out of ordinary transactions; they are not imposed upon them from on high or from any external and *a priori* source. But when they are formed, they are also formative; they regulate the proper conduct of the activities out of which they develop' (Dewey 1938: 102). And it is in this 'formative' way that thinking/concepts become operational; 'they formulate and define *ways* of operation on the part of those engaged in the transactions' (1938: 102).[1]

The pragmatic stance on patient safety developed in this book should be understood in this perspective: As a number of spatio-temporal propositions put forth in order to identify and enlighten the problem of patient safety. These findings should be approached as 'available resources in further inquiries' into the nature of error, safety and improvement in healthcare.

Notes

1. Contemporary uses of performativity, particularly in its poststructuralist version represented in, for instance, Judith Butler's feminist theory, are quite far from the rather practical and commonsensical Deweyian approach to the concept. This suggestion is in line with Paul du Gay's argument that recent approaches to performativity seek to establish it as a transcendental truth claim, rather than a useful way to engage with certain empirical phenomena (Du Gay 2010).

References

Baxter R, Taylor N, Kellar I and Lawton R (2015). Learning from positively deviant wards to improve patient safety: an observational study protocol. BMJ Open, 5: e009650. doi:10.1136/bmjopen-2015-009650

Bosk, C. L. (1979/2003). *Forgive and remember: Managing medical failure* (2nd ed.). Chicago: The University of Chicago Press.

Braithwaite, J., Wears, R. L., & Hollnagel, E. (2015). Resilient health care: Turning patient safety on its head. *International Journal for Quality in Healthcare, 27*(5), 418–420.

Brewin, T. (1994). Primum non nocere? *Lancet, 344*, 1487–1488.

Copenhagen University. (2016). SMEA15025U Kursus i patientsikkerhed og kvalitetsudvikling Årgang2016/2017. Retrieved from http://kurser.ku.dk/course/smea15025u

Dekker, S. (2012). *Just culture: Balancing safety and accountability* (2nd ed.). Farnham, London: Ashgate Publishing Ltd.

Dewey, J. (1916/1966). *Democracy and education: An introduction to the philosophy of education* (1st paperback ed.). New York: The Free Press.

Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York: Promentheus Books.

Dewey, J. (1932/1985). Ethics. In J. A. Boydston (Ed.), *The later works of John Dewey, 1925–1953* (Vol. 7). Carbondale: Southern Illinois University Press.

Dewey, J. (1933/1986). Essays and how we think. In J. A. Boydston (Ed.), *The later works of John Dewey, 1925–1953* (Vol. 8). Carbondale: Southern Illinois University Press.

Dewey, J. (1938). *Logic: The theory of inquiry*. New York: Henry Holt & Co.

Dewey, J. (1941). Propositions, warranted assertibility, and truth. *The Journal of Philosophy, 38*(7), 169–186.

Dewey, J., & Bentley, A. (1949). *Knowing and the know*. Boston, MA: The Beacon Press.

Du Gay, P. (2010). Performativities: Butler, Callon and the moment of theory. *Journal of Cultural Economy, 3*(2), 171–179.

Fox, R. (1957). Training for uncertainty. In R. K. Merton, G. Reader, & P. L. Kendall (Eds.), *The student-physician: Introductory studies in the sociology of medical education* (pp. 207–241). Cambridge, MA: Harvard University Press.

Hollnagel, E., Wears, R., & Braithwaite, J. (2015). *From Safety-I to Safety-II: A white paper*. The Resilient Health Care Net, Published by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia.

Holmes, S. (2009). In case of emergency: Misunderstanding tradeoffs in the war on terror. *California Law Review, 92*(2), 301–356.

Iedema R (2007). Critical Incident Reporting and the Discursive Reconfiguration of Feeling and Positioning. Journal of Applied Linguistics 2(3): 343–364.

Institute for Healthcare Improvement. (2017). *The next wave of patient safety*. Podcast featuring Derek Freeley and Donald Berwick. January 26. Retrieved

from http://www.ihi.org/resources/Pages/AudioandVideo/WIHI_NextWave_of_Patient_Safety.aspx

Jensen, C. B. (2008). Sociology, systems and (patient) safety: Knowledge translation in healthcare policy. *Sociology of Health & Illness, 30*(2), 309–324.

Jerak-Zuiderent, S. (2012). Certain uncertainties: Modes of patient safety in healthcare. *Social Studies of Science, 42*(5), 732–752.

Jonsen, A. R., & Toulmin, S. (1988). *The abuse of casuistry: A history of moral reasoning*. Berkeley: University of California Press.

Khatri, N., Brown, G.D., Hicks, L.L. (2009) From a blame culture to a just culture in health care, Health Care Management Review, 34(4):312–22.

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To err is human: Building a safer health system*. Committee on Quality of Healthcare in America, Institute of Medicine. Washington, DC: National Academy Press.

Law, J. (2000). *Ladbroke Grove: Or how to think about failing systems*. Centre for Science Studies, Lancaster University, UK. Retrieved June 29, 2013, from http://www.comp.lancs.ac.uk/sociology/papers/Law-Ladbroke-Grove-Failing-Systems.pdf

MacKenzie D, Muniesa F and Siu L (eds.) (2008). Do Economists Make Markets? On the Performativity of Economics, Princeton, NJ: Princeton University Press.

Mengis, J., & Nicolini, D. (2011). Challenges to learning from clinical adverse events: A study of root cause analysis in practice. In E. Rowley & J. Waring (Eds.), *A socio-cultural perspective on patient safety* (pp. 171–188). London: Ashgate Publishing Ltd.

Mesman, J. (2008). *Uncertainty and medical innovation: Experienced pioneers in neonatal care*. Basingstoke, UK: Palgrave Macmillan.

Morgan, D., Kirwan, K., Rorh, J., Rosenbloom, D., & Schaefer, D. (2010). Recovering, restoring, and renewing the foundations of American public administration: The contributions of Herbert J. Storing. *Public Administration Review, 70*, 621–633.

Murphy J, Allstetter P, Dropp K, Taylor L and Heath C (2009) The Root Cause Analysis (RCA) Process, One Step at a Time, Topic in Patient Safety, 9(3): 1–3.

Owen, C., Beguin, P., & Wackers, G. (Eds.). (2009). *Risky work environments: Reappraising human work within fallible systems*. Aldershot, London: Ashgate Publishing Ltd.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.

Rosenthal, M. M. (1995). *The incompetent doctor: Behind closed doors*. Philadelphia: Open University Press.

Sheps, S. B., & Cardiff, K. (2011). Patient safety: A wake-up call. *Clinical Governance: An International Journal, 16*(2), 148–158.

Smith, C. M. (2005). Origin and uses of *Primum Non Nocere*—Above all, do no harm! *The Journal of Clinical Pharmacology, 45*, 371–377.

Timbs, O. (2007). Introducing the idea of fair blame. *The Pharmaceutical Journal, 279*(Suppl.), B37–B38.

Walton, M. (2010). The WHO patient safety curriculum guide for medical schools. *Quality and Saftey in Health Care, 19*(6), 542–546. doi:10.1136/qshc.2009.036970.

WHO. (2009a). *Patient safety curriculum guide for medical schools*. Geneva, Switzerland: World Health Organization.

WHO. (2009b). *Curriculum guide: A summery*. Geneva, Switzerland: World Health Organization.

WHO. (2011). *Multi-professional patient safety curriculum guide*. Geneva, Switzerland: World Health Organization.

Woodward, H., Lemer, C., & Wu, A. (2009). An end to the witch hunts: Responding to the defenders of blame and shame: A commentary on Collins, Block, Arnold and Christakis. *Social Science and Medicine, 69*(9), 1291–1293.

References

Allen, D., Braithwaite, J., Sandall, J., & Waring, J. (2016). Towards a sociology of healthcare safety and quality. *Sociology of Health and Illness, 38*(2), 181–197.

Aristotle. (2000). *Nicomachean ethics* (R. Crisp, Ed.). Port Chester, NY: Cambridge University Press.

Arras, J. (1991). Getting down to cases: The revival of casuistry in bioethics. *The Journal of Medicine and Philosophy, 16*, 29–51.

Aspden, P., Wolcott, J., Bootman, J. L., & Cronenwett, L. R. (Eds.). (2006). *Preventing medication errors*. Medication Errors, Institute of Medicine. Washington, DC: The National Academies Press.

Atkinson, P. A. (1984). Training for certainty. *Social Science and Medicine, 19*, 949–956.

Baker, G. R., Norton, P. G., Flintoft, V., Blais, R., Brown, A., Cox, J., et al. (2004). The Canadian Adverse Events Study: The incidence of adverse events among hospital patients in Canada. *CMAJ: Canadian Medical Association Journal, 170*(11), 1678–1686.

Barker, G. R. (2004). The Canadian adverse events study: The incidence of adverse events among hospital patients in Canada. *Canadian Medical Association Journal, 170*(11), 1678–1686.

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7

Baxter, R., Taylor, N., Kellar, I., & Lawton, R. (2015). Learning from positively deviant wards to improve patient safety: An observational study protocol. *BMJ Open, 5*, e009650. doi:10.1136/bmjopen-2015-009650.

Becker, H. S. (1998). *Tricks of the trade: How to think about your research while you are doing it*. Chicago: The University of Chicago Press.

Beguin, P. (2009). Introduction: Shifting the focus to human work within complex socio-technical systems. In C. Owen, P. Beguin, & G. Wackers (Eds.), *Risky work environments: Reappraising human work within fallible systems*. London: Ashgate Publishing Ltd.

Benner, P., & Tanner, C. A. (1987). Clinical judgment: How expert nurses use intuition. *American Journal of Nursing, 87*(1), 23–31.

Berg, M. (1997). *Rationalizing medical work: Decision-support techniques and medical practices*. Cambridge, MA: MIT Press.

Bosch, S. J., & Wears, R. L. (2013). Resilience engineering: A better way of approaching patient safety? *Edra Connections, 1*, 7–9.

Bosk, C. L. (1979/2003). *Forgive and remember: Managing medical failure* (2nd ed.). Chicago: The University of Chicago Press.

Boud, D., Keogh, R., & Walker, D. (1985). *Reflection: Turning experience into learning*. London: Kogan Page.

Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge: Cambridge University Press.

Bowker, G. C., & Star, S. L. (1999). *Sorting things out: Classification and its consequences*. Cambridge, MA: MIT Press.

Bowker, G. C., Timmermans, S., & Star, S. L. (1995). Infrastructure and organizational transformation: Classifying nurses work. In W. Orlikowski, G. Walsham, M. R. Jones, & J. I. DeGross (Eds.), *Information technology and changes in organizational work* (pp. 344–370). London: Chapman and Hall.

Braithwaite, J., Wears, R. L., & Hollnagel, E. (2015). Resilient health care: Turning patient safety on its head. *International Journal for Quality in Healthcare, 27*(5), 418–420.

Brennan, T. A., Leape, L. L., Laird, N., et al. (1991). Incidence of adverse events and negligence in hospitalized patients: Results from the Harvard Medical Practice Study I. *New England Journal of Medicine, 324*, 370–376.

Brewin, T. (1994). Primum non nocere? *Lancet, 344*, 1487–1488.

Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of St. Brieuc Bay. In J. Law (Ed.), *Power, action and belief: A new sociology of knowledge* (pp. 196–233). London: Routledge & Kegan Paul.

Cassell, J. (2002). Social scientists studying doctors: 1951 to 2001. *Reviews in Anthropology, 31*(3), 243–262.

Cohen, M. D. (2007). Reading Dewey: Reflections on the study of routine. *Organization Studies, 28*(05), 773–786.

Collins, M. E., Block, S. D., Arnold, R. M., & Christakis, N. A. (2009). On the prospects for a blame-free medical culture. *Social Science and Medicine, 69*(9), 1287–1290.

Conway, J. B., & Weingart, S. N. (2005). Organizational change in the face of highly public errors—I. The Dana-Faber Cancer Institute experience. *Perspectives on Safety*, Patient Safety Network, Agency for Healthcare Research and Quality, US Department for Health and Human Services.

Copenhagen University. (2016). SMEA15025U Kursus i patientsikkerhed og kvalitetsudvikling Årgang2016/2017. Retrieved from http://kurser.ku.dk/course/smea15025u

Currie, G., Waring, J., & Finn, R. (2008). The limits of knowledge management for UK public services modernization: The case of patient safety and service quality. *Public Administration, 86*, 363–385.

Davis, P., Lay-Yee, R., Briant, R., et al. (2002). Adverse events in New Zealand public hospitals I: Occurrence and impact. *The New Zealand Medical Journal, 115*(1167), 1167–1172.

Dekker, S. (2006). *The field guide to understanding human error*. London: Ashgate Publishing Ltd.

Dekker, S. (2011). *Drift into failure: From hunting broken components to understanding complex systems*. Burlington, VT and London: Ashgate Publishing Ltd.

Dekker, S. (2012). *Just culture: Balancing safety and accountability* (2nd ed.). Farnham, London: Ashgate Publishing Ltd.

Dekker, S. W. A., & Breakey, H. (2016). 'Just culture': Improving safety by achieving substantive, procedural and restorative justice. *Safety Science, 85*, 187–193.

Department of Health. (2000). *An organisation with a memory: Expert group report*. London: Department of Health.

Department of Health. (2001). *Building a safer NHS for patients: Implementing an organization with a memory*. London: Department of Health.

Dewey, J. (1896). The reflex arc concept in psychology. *The Psychological Review, III*(4), 357–370.

Dewey, J. (1908/1978). Ethics. In J. A. Boydston (Ed.), *The middle works of John Dewey, 1899–1924* (Vol. 5). Carbondale: Southern Illinois University Press.

Dewey, J. (1916/1966). *Democracy and education: An introduction to the philosophy of education* (1st paperback ed.). New York: The Free Press.

Dewey, J. (1917). Duality and dualism. *The Journal of Philosophy, Psychology and Scientific Methods, 14*(18), 491–493.

Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology*. New York: Promentheus Books.

Dewey, J. (1925/1958). *Experience and nature*. Reprint 1958. New York: Dover Publications.

Dewey, J. (1929/1984). The quest for certainty. In J. A. Boydston (Ed.), *The later works of John Dewey, 1925–1953* (Vol. 4). Carbondale: Southern Illinois University Press.

Dewey, J. (1932/1985). Ethics. In J. A. Boydston (Ed.), *The later works of John Dewey, 1925–1953* (Vol. 7). Carbondale: Southern Illinois University Press.

Dewey, J. (1933/1986). Essays and how we think. In J. A. Boydston (Ed.), *The later works of John Dewey, 1925–1953* (Vol. 8). Carbondale: Southern Illinois University Press.

Dewey, J. (1938). *Logic: The theory of inquiry*. New York: Henry Holt & Co.

Dewey, J. (1941). Propositions, warranted assertibility, and truth. *The Journal of Philosophy, 38*(7), 169–186.

Dewey, J., & Bentley, A. (1949). *Knowing and the know*. Boston, MA: The Beacon Press.

Dodds, A., & Kodate, N. (2011). Accountability, organisational learning and risks to patient safety in England: Conflict or compromise? *Health, Risk and Society, 13*(4), 327–346.

Douglas, M. (1992). Risk and blame. In *Risk and blame: Essays in cultural theory* (pp. 3–21). London: Routledge.

Du Gay, P. (2000). *In praise of bureaucracy: Weber, organization, ethics*. London: Sage.

Du Gay, P. (2008). Without affection or enthusiasm' problems of involvement and attachment in 'responsive' public management. *Organization, 15*(3), 335–353.

Du Gay, P. (2010). Performativities: Butler, Callon and the moment of theory. *Journal of Cultural Economy, 3*(2), 171–179.

Du Gay, P., & Vikkelsø, S. (2012). Reflections: On the lost specification of 'change'. *Journal of Change Management, 12*(2), 121–143.

Du Gay, P., & Vikkelsø, S. (2013a). Exploitation, exploration and exaltation: Notes on a metaphysical (re)turn to 'one best way of organizing'. *Research in the Sociology of Organizations, 37*, 251–281.

Du Gay, P., & Vikkelsø, S. (2013b). What makes organization? Organizational theory as a 'practical science'. In P. Adler, P. Du Gay, G. Morgan, & M. Reed (Eds.), *Oxford handbook of sociology, social theory and organization studies: Contemporary currents*. Oxford: Oxford University Press.

Dyer, C., & Bryan, G. (2011). Devices designed to avoid wrong route administration of drugs. *Anaesthesia, 66*(12), 1181–1182.

Elkjaer, B. (2001). The learning organisation: An undelivered promise. *Management Learning, 32*(4), 437–452.

Elkjaer, B. (2004). Organizational learning: The third way. *Management Learning, 35*(4), 419–434.

Farjoun, M. (2010). Beyond dualism: Stability and change as a duality. *Academy of Management Review, 35*(2), 202–225.

Feldman, M. S., & Pentland, B. T. (2003). Re-conceptualizing routines as a source of flexibility and change. *Administrative Science Quarterly, 48*, 94–118.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry, 12*(2), 219–245.

Foucault, M. (1994). *The birth of the clinic: An archaeology of medical perception*. French edn 1963, English edn 1973. New York: Vintage Books.

Fox, R. (1957). Training for uncertainty. In R. K. Merton, G. Reader, & P. L. Kendall (Eds.), *The student-physician: Introductory studies in the sociology of medical education* (pp. 207–241). Cambridge, MA: Harvard University Press.

Fox, R. (1959). *Experiment perilous: Physicians and patients facing the unknown*. New Brunswick, NJ: Transaction Publishers.

Fox, R. C. (1980). The evolution of medical uncertainty. *The Milbank Memorial Fund Quarterly. Health and Society, 58*(1), 1–49.

Fox, R. C. (2000a). Medical uncertainty revisited. In G. L. Albrecht, R. Fitzpatrick, & S. C. Scrimshaw (Eds.), *The handbook of social studies in health and medicine* (pp. 409–427). London: Sage Publications.

Fox, R. C., & Swazey, J. (1974). *The courage to fail: A social view of organ transplants and dialysis*. Chicago: University of Chicago Press.

Fox, S. (2000b). Communities of practice: Foucault and actor network theory. *Journal of Management Studies, 37*(6), 853–868.

Freidson, E. (1975). *Doctoring together: A study of professional social control*. Chicago: University of Chicago Press.

Freidson, E. (2001). *Professionalism, the third logic: On the practice of knowledge*. Chicago: The University of Chicago Press.

Gherardi, S. (2000). Practice-based theorizing on learning and knowing in organizations. *Organization, 7*(2), 211–233.

Glaser, B. G., & Strauss, A. L. (1968). *Time for dying*. Hawthorne, NY: Aldine.
Gorovitz, S., & MacIntyre, A. (1976). Toward a theory of medical fallibility. *Journal of Medicine and Philosophy, 1*(1), 51–53.
Green, C. (2012). Nursing intuition: A valid form of knowledge. *Nursing Philosophy, 13*(2), 98–111.
Grol, R., Berwick, D., & Wensing, M. (2008). On the trail of quality and safety in healthcare. *British Medical Journal, 336*, 74–76.
Hale, A. (2014). Foundations of safety science: A postscript. *Safety Science, 67*, 64–69.
Harris, F. (2007). Dewey's concepts of stability and precariousness in his philosophy of education. *Education and Culture, 23*(1), 38–54.
Hilgartner, S. (1992). The social construction of risk objects: Or, how to pry open networks of risk. In J. F. Short & L. Clarke (Eds.), *Organizations, uncertainties and risk* (pp. 39–53). Boulder, CO: Westview Press.
Hillman, K., Chen, J., Cretikos, M., et al. (2005). Introduction of the medical emergency team (MET) system: A cluster-randomized controlled trial. *Lancet, 365*, 2091–2097.
Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics, 4*, 1–23.
Hollnagel, E. (2006). Resilience: The challenge of the unstable. In E. Hollnagel, D. D. Woods, & N. Leveson (Eds.), *Resilience engineering: Concepts and precepts* (pp. 9–17). London: Ashgate Publishing Ltd.
Hollnagel, E. (2012a). *FRAM: The Functional Resonance Analysis Method: Modelling complex socio-technical systems*. Surrey, London: Ashgate Publishing Ltd.
Hollnagel, E. (2012b). Coping with complexity*:* Past, present and future. *Cognition, Technology & Work, 14*, 199–205.
Hollnagel, E., Braithwaite, J., & Wears, R. (Eds.). (2013). *Resilient health care*. Surrey, London: Ashgate Publishing Ltd.
Hollnagel, E., Wears, R., & Braithwaite, J. (2015). *From Safety-I to Safety-II: A white paper*. The Resilient Health Care Net, Published by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia.
Hollnagel, E., Woods, D. D., & Leveson, N. (2006). *Resilience engineering: Concepts and precepts*. London: Ashgate Publishing Ltd.
Holmes, S. (2009). In case of emergency: Misunderstanding tradeoffs in the war on terror. *California Law Review, 92*(2), 301–356.
Hunter, I. (2006). The history of theory. *Critical Inquiry, 3*, 78–112.

Hunter, I., & Saunder, D. (1995). Walks of life: Mauss on the human gymnasium. *Body & Society, 1*, 65–81.

Iedema, R. (2007). Critical incident reporting and the discursive reconfiguration of feeling and positioning. *Journal of Applied Linguistics, 2*(3), 343–364.

Iedema, R. (2009). New approaches to researching patient safety. *Social Science & Medicine, 69*(9), 1701–1704.

Iedema, R., & Carroll, K. (2011). The "clinalyst": Institutionalizing reflexive space to realize safety and flexible systematization in health care. *Journal of Organizational Change Management, 24*(2), 175–190.

Iedema, R., Jorm, C., Braithwaite, J., et al. (2006). A root cause analysis of clinical error: Confronting the disjunction between formal rules and situated clinical activity. *Social Science and Medicine, 63*(6), 1201–1212.

Iedema, R., Mesman, J., & Carroll, K. (2013). *Visualising health care improvement: Innovation from within*. Oxford, UK: Radcliffe.

Institute for Healthcare Improvement. (2017). *The next wave of patient safety*. Podcast featuring Derek Freeley and Donald Berwick. January 26. Retrieved from http://www.ihi.org/resources/Pages/AudioandVideo/WIHI_NextWave_of_Patient_Safety.aspx

Jaeger, W. (1957). Aristotle's use of medicine as model of method in his ethics. *The Journal of Hellenic Studies, 77*(1), 54–61.

Jeffcott, S., Ibrahim, J., & Cameron, P. (2009). Resilience in healthcare and clinical handover. *Quality and Safety in Health Care, 18*, 256–260.

Jensen, C. B. (2008). Sociology, systems and (patient) safety: Knowledge translation in healthcare policy. *Sociology of Health & Illness, 30*(2), 309–324.

Jensen, E. B. (2004). *Root cause analysis: Compendium for use by patient safety officers and others responsible for conducting root cause analysis of adverse events*. Copenhagen: Dansk Selskab for Patientsikkerhed.

Jensen, M. L., & Pedersen, K. Z. (2010). *Utilsigtede hændelser i den kommunale plejesektor*. Copenhagen: DSI.

Jerak-Zuiderent, S. (2012). Certain uncertainties: Modes of patient safety in healthcare. *Social Studies of Science, 42*(5), 732–752.

Joint Commission. (2013). Root cause analysis and action plan framework template. March 22. Retrieved from https://www.jointcommission.org/framework_for_conducting_a_root_cause_analysis_and_action_plan/

Jonsen, A. R. (1996). Morally appreciated circumstances: A theoretical problem for casuistry. In W. Sumner & J. Boyle (Eds.), *Philosophical perspectives on bioethics* (pp. 37–49). Toronto: University of Toronto Press.

Jonsen, A. R., & Toulmin, S. (1988). *The abuse of casuistry: A history of moral reasoning*. Berkeley: University of California Press.

Jordan, S., Messner, M., & Becker, A. (2009). Reflection and mindfulness in organizations: Rationales and possibilities for integration. *Management Learning, 40*(4), 465–473.

Khatri, N., Brown, G. D., & Hicks, L. L. (2009). From a blame culture to a just culture in health care. *Health Care Management Review, 34*(4), 312–322.

Khatri, N., Brown, G. D., & Lanis, L. (2009). From a blame culture to a just culture in health care. *Hicks Health Care Manage Rev, 34*(4), 312–322.

Khushf, G. (2004). *Handbook of bioethics: Taking stock of the field from a philosophical perspective*. Hingham, MA: Kluwer Academic Publishers.

Klevens, R. M., Edwards, J. R., Richards, C. L., Jr., et al. (2007). Estimating health care-associated infections and deaths in U.S. hospitals, 2002. *Public Health Reports, 122*, 160–166.

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To err is human: Building a safer health system*. Committee on Quality of Healthcare in America, Institute of Medicine. Washington, DC: National Academy Press.

Landrigan, C. P., Parry, G. J., Bones, C. B., et al. (2010). Temporal trends in rates of patient harm resulting from medical care. *The New England Journal of Medicine, 363*(22), 2124–2134.

Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Milton Keynes: Open University Press.

Latour, B., & Woolgar, S. (1979). *Laboratory life: The social construction of scientific facts*. Beverly Hills, CA: Sage.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.

Law, J. (2000). *Ladbroke Grove: Or how to think about failing systems*. Centre for Science Studies, Lancaster University, UK. Retrieved June 29, 2013, from http://www.comp.lancs.ac.uk/sociology/papers/Law-Ladbroke-Grove-Failing-Systems.pdf

Leape, L. L. (1994). Error in medicine. *JAMA: The Journal of the American Medical Association, 272*(23), 1851–1857.

Leape, L. L. (1997). A systems analysis approach to medical error. *Journal of Evaluation in Clinical Practice, 3*(3), 213–222.

Leape, L. L. (2009). Errors in medicine. *Clinica Chimica Acta; International Journal of Clinical Chemistry, 404*(1), 2–5.

Leape, L. L., Brennan, T. A., Laird, N., et al. (1991). The nature of adverse events in hospitalized patients: Results of the Harvard Medical Practice Study II. *New England Journal of Medicine, 324*(6), 377–384.

Leape, L. L., Woods, D. D., Hatlie, M. J., et al. (1998). Promoting patient safety by preventing medical error. *JAMA, 280*(16), 1444–1447.

Lesar, T. S. (2002). Tenfold medication dose prescribing errors. *The Annals of Pharmacotherapy, 36*(12), 1833–1839.

Levinthal, D. A., & Rerup, C. (2006). Crossing an apparent chasm: Bridging mindful and less-mindful perspectives on organizational learning. *Organization Science, 17*, 502–513.

Lloyd-Bostock, S., & Hutter, B. M. (2008). Reforming regulation of the medical profession: The risks of risk-based approaches. *Health, Risk and Society, 10*(1), 69–83.

Maharaj, R., Raffaele, I., & Wendon, J. (2015). Rapid response systems: A systematic review and metanalysis. *Critical Care, 19*, 254.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*, 71–87.

Mauss, M. (1934). Techniques of the body (B. Brewster, Trans. 1973). *Economy and Society, 2*(1), 70–88.

McDonald, R., Waring, J., & Harrison, S. (2005). 'Balancing risk, that is my life': The politics of risk in a hospital operating theatre department. *Health, Risk & Society, 7*(4), 397–411.

McDonald, R., Waring, J., & Harrison, S. (2006). Rules, safety and the narrativisation of identity: A hospital operating theatre case study. *Sociology of Health & Illness, 28*, 178–202.

Mengis, J., & Nicolini, D. (2011). Challenges to learning from clinical adverse events: A study of root cause analysis in practice. In E. Rowley & J. Waring (Eds.), *A socio-cultural perspective on patient safety* (pp. 171–188). London: Ashgate Publishing Ltd.

Merleau-Ponty, M. (1962). *Phenomenology of perception* (C. Smith, Trans.). London: Routledge & K. Paul.

Mesman, J. (2008). *Uncertainty and medical innovation: Experienced pioneers in neonatal care*. Basingstoke, UK: Palgrave Macmillan.

Mesman, J. (2009). The geography of patient safety: A topical analysis of sterility. *Social Science & Medicine, 69*(9), 1705–1712.

Mesman, J. (2011). Resources of strength: An exnovation of hidden competences to preserve patient safety. In E. Rowley & J. Waring (Eds.), *A socio-cultural perspective on patient safety* (pp. 71–94). London: Ashgate Publishing Ltd.

Miller, P. (1990). On the interrelations between accounting and the state. *Accounting, Organizations and Society, 15*(4), 315–338.

Miller, P. (1991). Accounting innovation beyond the enterprise: Problematizing investment decisions and programming economic growth in the UK in the 1960s. *Accounting, Organizations and Society, 18*(8), 733–762.

Ministry of Interior and Health. (2011). *Vejledning om rapportering af utilsigtede hændelser i sundhedsvæsenet m.v.* Vejledning nr. 1 af 03.01.2011. Copenhagen: Indenrigs- og sundhedsministeriet.

Mintzberg, H. (1983). *Structure in fives: Designing effective organizations*. Engelwood Cliffs, NJ: Prentice-Hall.

Montgomery, K. (2005). *How doctors think: Clinical judgment and the practice of medicine*. Cary, NC: Oxford University Press.

Montgomery, K. (2009). Thinking about thinking: Implications for patient safety. *Healthcare Quarterly (Toronto, Ont.)*, 12 Spec No Patient.

Morgan, D., Kirwan, K., Rorh, J., Rosenbloom, D., & Schaefer, D. (2010). Recovering, restoring, and renewing the foundations of American public administration: The contributions of Herbert J. Storing. *Public Administration Review, 70*, 621–633.

Murphy, J., Allstetter, P., Dropp, K., Taylor, L., & Heath, C. (2009a). The root cause analysis (RCA) process, one step at a time. *Topic in Patient Safety, 9*(3), 1–3.

Murphy, J., Allstetter, P., Dropp, K., Taylor, L., & Heath, C. (2009b). The root cause analysis (RCA) process, one step at a time. *Topic in Patient Safety, 9*(3), 1–3.

National Patient Safety Agency. (2007, March 28). Promoting safer measurement and administration of liquid medicines via oral and other enteral routes. *Patient Safety Alert, 19*, 1–12.

Nemeth, C., Wears, R., Woods, D., et al. (2008). Minding the gaps: Creating resilience in health care. In K. Henriksen, J. B. Battles, M. A. Keyes, et al. (Eds.) *Advances in patient safety: New directions and alternative approaches* (Vol. 3: Performance and Tools). Rockville, MD: Agency for Healthcare Research and Quality

NHS. (2008). Root Cause Analysis Investigation Tools: Guide to investigation report writing following Root Cause Analysis of patient safety incidents. National Patient Safety Agency.

Nielsen, AJ (2010). *Travelling technologies and transformations in healthcare*. PhD Series, Copenhagen Business School, Copenhagen.

Owen, C., Beguin, P., & Wackers, G. (Eds.). (2009). *Risky work environments: Reappraising human work within fallible systems*. Aldershot, London: Ashgate Publishing Ltd.

Pagan, NO (2008). Configuring the moral self: Aristotle and Dewey. *Foundations of Science, 13*, 239–250. The Netherlands: Springer Science & Business Media B.V.

Paget, M. (1988). *The unity of mistake: A phenomenological interpretation of medical work*. Philadelphia: Temple University Press.

Pedersen, KZ (2013). *Failsafe organizing: A pragmatic stance on patient safety*. PhD Series 32.2013, Doctoral School of Organisation, Copenhagen Business School, Copenhagen.

Pedersen, K. Z. (2016). Standardization or resilience? The paradox of stability and change in patient safety. *Sociology of Health and Illness, 38*(7), 1180–1193.

Pedersen, K. Z., & Kjaer, P. (2017). "The new patient": The emergence of a political persona. *International Journal of Public Sector Management, 30*(1), 85–98.

Perrow, C. (1972/1979). *Complex organizations: A critical essay* (2nd ed.). New York: McGraw-Hill Publishers.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.

Pirnejad, H., & Bal, R. (2011). The precarious gap between information technology and patient safety: Lessons from medication systems. In E. Rowley & J. Waring (Eds.), *A socio-cultural perspective on patient safety* (pp. 51–70). London: Ashgate Publishing Ltd.

Power, M. (1997). *The audit society: Rituals of verification*. Oxford: Oxford University Press.

Power, M. (2004). *The risk management of everything: Rethinking the politics of uncertainty*. London: Demos.

Power, M. (2007). *Organized uncertainty: Designing a world of risk management*. Oxford: Oxford University Press.

Power, M., Scheytt, T., Soin, K., & Sahlin, K. (2009). Reputational risk as a logic of organizing in late modernity. *Organization Studies, 30*(2/3), 301–324.

Rasmussen, J. (1999). The concept of human error: Is it useful for the design of safe systems? *Safety Science Monitor*. Special Edition: Philosophy of Safety 3, article 1.

Reason, J. (1990). *Human error*. Cambridge: Cambridge University Press.

Reason, J. (1997). *Managing the risks of organizational accidents*. London: Ashgate Publishing Ltd.

Reason, J. (2000). Human error: Models and management. *BMJ, 320*, 768–770.

Reason, J., Carthey, J., & de Leval, M. R. (2001). Diagnosing "vulnerable system syndrome": An essential prerequisite to effective risk management. *Quality in Health Care, 10*(2), 21–25.

Reason, J., Hollnagel, E., & Paries, J. (2006). *Revisiting the Swiss Cheese Model of accidents*. Project Safbuild. EEC Note No. 13/06. Eurocontrol: European Organisation for the Safety of Air Navigation.

Rew, L., & Barron, E. (1987). Intuition: A neglected hallmark of nursing knowledge. *Advances in Nursing Science, 10*(1), 49–62.

Rose, N., & Miller, P. (1992). Political power beyond the state: Problematics of government. *British Journal of Sociology, 43*(2), 172–205.

Rosenthal, M. M. (1995). *The incompetent doctor: Behind closed doors*. Philadelphia: Open University Press.

Rowley, E., & Waring, J. (2011). Introduction: A socio-cultural perspective on patient safety. In E. Rowley & J. Waring (Eds.), *A socio-cultural perspective on patient safety* (pp. 1–12). London: Ashgate Publishing Ltd.

Schiøler, T., Lipczak, H., Frølich, A., et al. (2001). *Utilsigtede hændelser på danske sygehuse*. Copenhagen: DSI.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.

Schön, D. A. (1987). *Educating the reflective practitioner: Towards a new design for teaching and learning in the professions*. San Francisco, CA: Jossey-Bass.

Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday Currency.

Senge, P. M. (1999). The life cycle of typical change initiatives. In P. M. Senge et al. (Eds.), *The dance of change: The challenges of sustaining momentum in learning organizations* (pp. 5–10). London: Nicholas Brealey Publishing.

Senge, P. M., & Sterman, J. D. (1992). Systems thinking and organizational learning: Acting locally and thinking globally in the organization of the future. *European Journal of Operational Research, 59*, 137–150.

Sheps, S. B., & Cardiff, K. (2011). Patient safety: A wake-up call. *Clinical Governance: An International Journal, 16*(2), 148–158.

Smith, C. M. (2005). Origin and uses of *Primum Non Nocere*—Above all, do no harm! *The Journal of Clinical Pharmacology, 45*, 371–377.

Star, S. L., & Strauss, A. (1999). Layers of silence, arenas of voice: The ecology of visible and invisible work. *Computer Supported Cooperative Work, 8*(1–2), 9–30.

Strathern, M. (Ed.). (2000a). *Audit cultures: Anthropological studies in accountability, ethics and the academy*. London: Routledge.

Strathern, M. (2000b). The tyranny of transparency. *British Educational Research Journal, 26*(3), 309–321.

Strauss, A. L., Faugerhaugh, S., Suczek, B., & Wiener, B. (1985). *Social organization of medical work*. Chicago and London: University of Chicago Press.

Sutcliffe, K. M., Sitkin, S. B., & Browning, L. D. (2004). Tailoring process management to situational requirements: Beyond the control and exploration dichotomy. In M. L. Tushman & P. Anderson (Eds.), *Managing strategic innovation and change* (pp. 178–191). New York: Oxford University Press.

Svenningsen, S. (2003). *Electronic patient records and medical practice: Reorganization of roles, responsibilities, and risks*. PhD Series 10.2003, Copenhagen Business School, Copenhagen.

Taxis, K., & Barber, N. (2003). Causes of intravenous medication errors: An ethnographic study. *Qual Saf Health Care, 12*, 343–348.

The Danish Patient Safety Authority. (2016). Dansk Patientsikkerhedsdatabase Årsberetning 2015. Styrelsen for Patientsikkerhed, Copenhagen.

The Danish Patient Safety Authority. (2017a). Dansk Patientsikkerhedsdatabase Årsberetning 2016. Styrelsen for Patientsikkerhed, Copenhagen.

The Danish Patient Safety Authority. (2017b). Dansk Patientsikkerhedsdatabase Årsberetning 2016. Styrelsen for Patientsikkerhed, Copenhagen.

Thorpe, K. E. (2004). The medical malpractice 'crisis': Recent trends and the impact of state tort reforms. *Health Affairs*, Web exclusives, W4-20-30.

Timbs, O. (2007). Introducing the idea of fair blame. *The Pharmaceutical Journal, 279*(Suppl.), B37–B38.

Timmermans, S., & Almeling, R. (2009). Objectification, standardization, and commodification in healthcare: A conceptual readjustment. *Social Science & Medicine, 69*(9), 21–27.

Timmermans, S., & Angell, A. (2001). Evidence-based medicine, clinical uncertainty, and learning to doctor. *Journal of Health and Social Behavior, 42*(4), 342–359.

Timmermans, S., & Berg, M. (2003). *The gold standard: The challenge of evidence-based medicine and standardization in healthcare*. Philadelphia: Temple University Press.

Timmermans, S., & Mauck, A. (2005). The promises and pitfalls of evidence-based medicine. *Health Affairs, 24*(1), 18–28.

Toulmin, S. (1984). Introduction to the quest for certainty. In J. A. Boydston (Ed.), *The later works of John Dewey 1925–1953: Vol. 4: 1929: The quest for certainty* (pp. vii–xxii). Carbondale: Southern Illinois University Press.

Toulmin, S. (1993). Literary theory, philosophy of science, and persuasive discourse: Thoughts from a neo-premodernist. Interview by Olson GA. *JAC, 13*(2): 283–309.

Van Fraassen, B. C. (2002). *The empirical stance*. New Haven, CT and London: Yale University Press.

Vaughan, D. (1996). *The challenger launch decision, risky technology, culture and deviance at NASA*. Chicago: University of Chicago Press.

Vikkelsø, S. (2005). Subtle redistribution of work, attention and risks: Electronic patient records and organisational consequences. *Scandinavian Journal of Information Systems, 17*(1), 3–30.

Vincent, C. (2010). *Patient safety* (2nd ed.). BMJ Books. West Sussex, UK: Blackwell Publishing.

Vincent, C., Burnett, S., & Carthey, J. (2013). *The measurement and monitoring of safety: Drawing together academic evidence and practical experience to produce a framework for safety measurement and monitoring*. London: The Health Foundation.

Vincent, C., Neale, G., & Woloshynowych, M. (2001). Adverse events in British hospitals: Preliminary retrospective record review. *British Medical Journal, 322*(7285), 517–519.

Vincent, C. A., & Coulter, A. (2002). Patient safety: What about the patient? *Quality and Safety in Health Care, 11*(1), 76–80.

Wachter, R. M., & Pronovost, P. J. (2009). Balancing no-blame with accountability in patient safety. *New England Journal of Medicine, 361*, 1401–1406.

Walker, J., & Cooper, M. (2011). Genealogies of resilience: From systems ecology to the political economy of crisis adaptation. *Security Dialogue, 42*(2), 143–160.

Walton, M. (2010). The WHO patient safety curriculum guide for medical schools. *Quality and Saftey in Health Care, 19*(6), 542–546. doi:10.1136/qshc.2009.036970.

Waring, J. (2007a). Adaptive regulation or governmentality: Patient safety and the changing regulation of medicine. *Sociology of Health & Illness, 29*(2), 163–179.

Waring, J. (2007b). Doctors' thinking about 'the system' as a threat to patient safety. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine, 11*(1), 29–46.

Waring, J. (2009). Constructing and re-constructing narratives of patient safety. *Social Science & Medicine, 69*(9), 1722–1731.

Waring, J., Allen, D., Braithwaite, J., & Sandall, J. (2016). Healthcare quality and safety: A review of policy, practice and research. *Sociology of Health and Illness, 38*, 198–215.

Weick, K. E. (2001). *Making sense of the organization*. Boston, MA: Blackwell Publishing.

Weick, K. E. (2007). Drop your tools: On reconfiguring management education. *Journal of Management Education, 31*(1), 5–16.

Weick, K. E., & Quinn, R. E. (1999). Organizational change and development. *Annual Review of Psychology, 50*, 361–386.

Weick, K. E., & Sutcliffe, K. M. (2007). *Managing the unexpected: Resilient performance in an age of uncertainty* (2nd ed.). San Francisco: Jossey-Bass, Wiley.
Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge, UK: Cambridge University Press.
Westbrook, J. I., Rob, M. I., Woods, A., et al. (2011). Errors in the administration of intravenous medications in hospital and the role of correct procedures and nurse experience. *BMJ Quality & Safety, 20*(12), 1027–1034.
WHO. (2004). *World alliance for patient safety*. Geneva: World Health Organization.
WHO. (2005). *World alliance for patient safety: Draft guidelines for adverse event reporting and learning systems. From information to action*. Geneva, Switzerland: World Health Organization.
WHO. (2008). WHO surgical safety checklist. World Alliance for Patient Safety.
WHO. (2009a). *Patient safety curriculum guide for medical schools*. Geneva, Switzerland: World Health Organization.
WHO. (2009b). *Curriculum guide: A summery*. Geneva, Switzerland: World Health Organization.
WHO. (2011a). *Multi-professional patient safety curriculum guide*. Geneva, Switzerland: World Health Organization.
WHO. (2011b). *Report on the burden of endemic health care-associated infection worldwide*. Geneva, Switzerland: World Health Organization.
WHO. (2016a). Retrieved from http://www.euro.who.int/en/health-topics/Health-systems/patient-safety
WHO. (2016b). Patient safety research: Introductory course. Retrieved from http://www.who.int/patientsafety/research/online_course/en/
Wildavsky, A. (1991). *Searching for safety*. New Brunswick, NJ: Transaction.
Wilson, R. M., Runciman, W. B., Gibberd, R. W., et al. (1995). The quality in Australian health care study. *The Medical Journal of Australia, 163*(9), 458–471.
Woods, D., & Hollnagel, E. (2006). Prologue: Resilience engineering concepts. In E. Hollnagel, D. D. Woods, & N. Leveson (Eds.), *Resilience engineering: Concepts and precepts* (pp. 1–7). London: Ashgate Publishing Ltd.
Woodward, H., Lemer, C., & Wu, A. (2009). An end to the witch hunts: Responding to the defenders of blame and shame: A commentary on Collins, Block, Arnold and Christakis. *Social Science and Medicine, 69*(9), 1291–1293.
Wu, A. (2000). Medical error: The second victim. *British Medical Journal, 320*, 726–727.

Yakhlef, A. (2010). The corporeal of practice-based learning. *Organizations Studies, 31*, 409–430.

Zuiderent-Jerak, T. (2007). Preventing implementation: Exploring interventions with standardization in healthcare. *Science as Culture, 16*(3), 311–329.

Zuiderent-Jerak, T. (2015). *Situated intervention: Sociological experiments in healthcare*. Cambridge, MA: The MIT Press.

Zuiderent-Jerak, T., & Berg, M. (2010). The sociology of quality and safety in healthcare: Studying a movement and moving sociology. In C. E. Bird, P. Conrad, A. M. Fremont, & S. Timmermans (Eds.), *The handbook of medical sociology* (6th ed., pp. 324–340). Nashville, TN: Vanderbilt University Press.

Zuiderent-Jerak, T., Strating, M., Nieboer, A., & Bal, R. (2009). Sociological refigurations of patient safety: Ontologies of improvement and 'acting with' quality collaboratives in healthcare. *Social Science & Medicine, 69*(9), 1713–1721.

Index

K.Z. Pedersen, *Organizing Patient Safety*, Health, Technology and Society,
https://doi.org/10.1057/978-1-137-53786-7