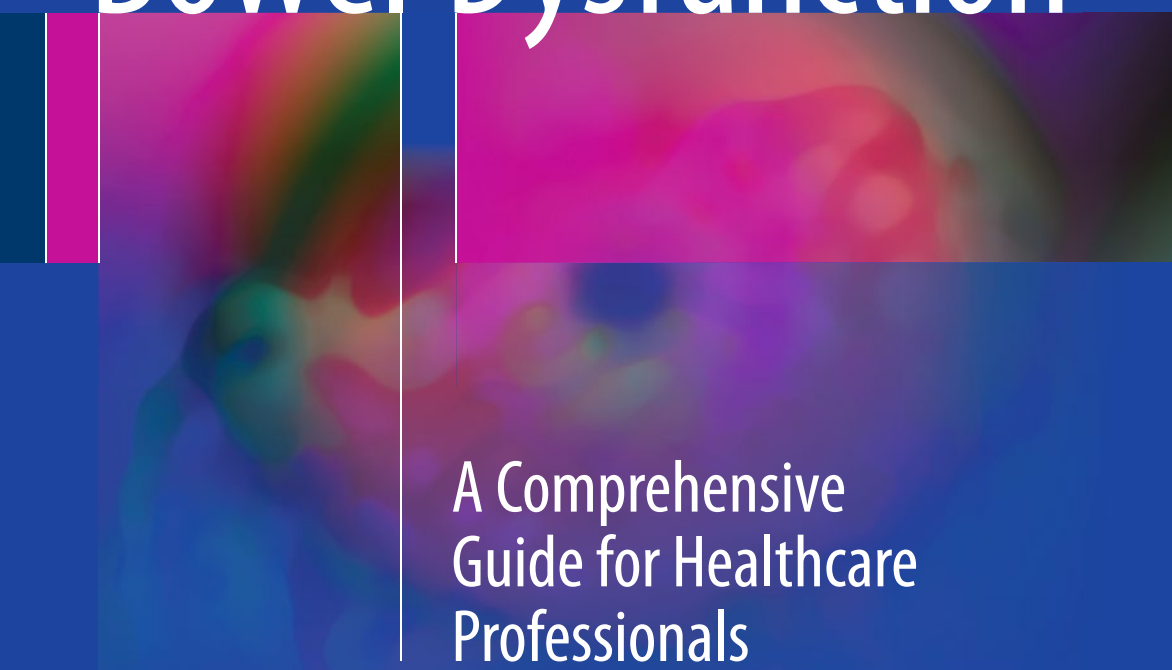
Brigitte Collins
Elissa Bradshaw
Editors

Bowel Dysfunction



A Comprehensive Guide for Healthcare Professionals

Springer

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Foreword for Bowel Dysfunction: The Comprehensive Guide for Healthcare Professionals

Medicine is becoming ever more specialist. Previously any discussion pertaining to constipation or faecal incontinence would have merited no more than a few paragraphs in textbook on gastrointestinal illness. The first edition of this book is a timely reflection of the quantity of emerging literature in the area of colorectal functional disorders. A search of the literature just 25 years ago reveals that there were 447 articles on these two topics combined, whereas by 2015 there was a near four-fold increase, to a total of 1836 manuscripts. This increase in publications has reflected the increasing burden of clinical work: in the USA there are an estimated 2.5 million physician visits and 100,000 hospitalizations annually for chronic constipation.

This book serves the reader both as a clinical guide, but also a source of the basic scientific principles underlying clinical presentation and emerging treatments. It is very much in the model of expertise from a specialist centre, and there is no centre more celebrated internationally than St Mark's in the UK, where the majority of the authorship hails from. The work is a collaborative effort, reflecting the interdisciplinary nature of specialist care in this area. The initial chapters are organised by symptom presentation. The final chapters are organised by treatment modality, appropriately given that bowel evacuation and continence are two ends of a spectrum with considerable presentation overlap. As such, treatments are often tailored to manage both symptoms.

It is easy to see this book becoming a standard text for future students, but it is equally a clinical guide for current practice. The editors and authors are to be congratulated for compiling these state of the art reviews and accomplishing both these objectives in such a readable fashion.

June 2016

Anton Emmanuel,
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Part I

Introduction

The Background

1

Brigitte Collins and Elissa Bradshaw

1.1 Introduction to Bowel Dysfunction

The topic of bowels and bowel control remain a taboo subject for many. From the time we become continent it becomes a largely controlled activity that many of us take for granted and do not discuss in any detail, and yet we are beginning to understand the prevalence of bowel problems.

A functional bowel disorder was first defined as a bowel problem which does not have a structural or biological cause [9]. We would like expand upon this definition because some of the conditions we will discuss in this book do have a structural cause, as with evacuatory dysfunction secondary to a rectocele, or incontinence secondary to a sphincter defect. We will therefore define functional bowel disorders and bowel dysfunction as the subset of troubling symptoms, which may or may not have a structural or biological cause, but which mean the bowel, and or anorectum and/or pelvic floor do not function at an optimum.

Constipation is the most common functional bowel disorder and is defined as a symptom, not a disease with 2.5 million sufferers in the UK (www.my-bowel.co.uk [12]). Nearly all of us will be constipated at one time or another throughout our lives [8]. For some, constipation is temporary and easily preventable therefore health care professionals require an understanding of the causes in order to address symptoms. Constipation and evacuatory dysfunction are no longer viewed as just the preserve of the elderly. Most cases are not caused by one specific condition. Causes are often multifactorial with several contributory factors including secretory and motor functions of the gastrointestinal tract, central and peripheral gastrointestinal function, in addition to external factors of environmental, genetic and comorbidity [3]. Defining Constipation is therefore extremely

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complex [3]. In an attempt to provide classification the Rome III criteria define constipation as: straining, incomplete evacuation, lumpy stools, sensation of blockage and having to manually evacuate at least 25 % of all bowel motions and defaecating less than three a week [4]. Constipation differs from one person to another with varying bowel habits and symptoms, making any single definition a challenge to use in clinical practice [2]. As a result treatment is not always straightforward and may need to take on a multimodal approach to effectively manage symptoms

Similarly, faecal incontinence is a functional gastrointestinal disorder that requires a symptom-based approach instead of a disease based approach [4]. Faecal incontinence is an uncontrolled leakage through the anal canal. The anal canal should open only during defaecation, and remain closed at all times by virtue of the internal and external anal sphincter muscles. The internal anal sphincter is under the control of the autonomic nervous system, involuntary control and the external anal sphincter is under voluntary control [10]. In controlled defaecation, once the rectum has reached its full capacity to formed stool, it stretches and triggers a reflex, this reflex is under the control of the autonomic nervous system, this incites the sensation to defaecate. When the faeces have entered the rectum, the internal anal sphincter relaxes and opens allowing the passage of faeces, where the external anal sphincter relaxes and allows defaecation to proceed and faeces are expelled through the anus [11]. Any disruption to this process can lead to faecal incontinence.

Rome IV was formulated during the publication of this book. A main difference is in the subclassifications of IBS. Finally, The Rome III classification for IBS required that the proportion of total stools using the Bristol Stool Form Scale be used to classify IBS with predominant diarrhea (>25% loose/watery, <25% hard/lumpy), IBS with predominant constipation (>25% hard/lumpy, <25% loose/watery), mixed-type IBS (>25% loose/watery, >25% hard/lumpy), and IBS unclassified (<25% loose/watery, <25% hard/lumpy). Rome IV recognises that the very nature of IBS means that patients may experience settled periods, with normal stool types, and the criteria were changed to incorporate the proportion of days with symptomatic stools. As a result, classification is more rigorous.

It is difficult to assess exactly how many people experience faecal incontinence as many are too embarrassed to speak about this condition, and some people consider this to be a normal result of the ageing process [5]. However, the National Institute of Clinical Excellence (NICE) [7] reports that current data shows that between 1 % and 10 % of adults are affected with faecal incontinence – although this may just involve those that report faecal incontinence. The actual number could be much higher. It is postulated that at least 1.0 % of adults experience faecal incontinence at some time, and this will affect their quality of life. For reasons that are completely understandable, faecal incontinence has remained largely stigmatised, with many patients feeling too embarrassed or ashamed to admit their symptoms to healthcare professionals. Faecal incontinence occurs more in woman than men [1]. This could be as a result of pregnancy and obstetric injury, the hormones that affect the pelvic floor during menopause or the fact that women may be more likely to seek medical advice [6].

Despite the complexities, our understanding of the functional bowel disorders is improving, and there is an increased acceptance of the impact of bowel dysfunction on patients' quality of life. Although we wish to cure patients, our treatment at St Marks in the Biofeedback department is structured towards empowering patients to manage independently, improving their quality of life.

Our rationale for writing this book was to present the current information available for bowel dysfunction and also to discuss the emergent treatments available. St Marks, as a centre of excellence provides a unique setting in which to learn and understand the complexities of patients' symptoms, and the often detrimental effect on their lives. The advent of Biofeedback therapy started with Dr Michael Kamm and has seen a service evolution that has surpassed any of our expectations. That is not to say that our service and treatment delivery is the best way, but we hope to provide an insight into our beliefs and treatment strategies. The patient group is ever more complicated requiring the approaches employed by allied health professionals. Our unit is led by Miss Carolynne Vaizey, a highly respected Colorectal surgeon. This was seen by some to be an unusual choice given that the main protagonists have been physicians, but as Miss Vaizey herself has stated "a good pelvic floor surgeon does not operate often. Instead we recognise the value and effectiveness of the conservative management delivered by our allied health professional colleagues" (pers. 2016).

We are seeing the collaboration of the multi and inter disciplinary teams throughout centres, creating specialist Multi Disciplinary Teams (MDT) sharing cases, information and potential treatment. Our options for management have grown exponentially and this is an exciting time to work within the discipline.

We hope you enjoy reading this book as much as we have enjoyed collaborating with our colleagues on its formulation. Nurses have been shown to be ideally placed to assist in managing functional bowel symptoms, but we have not compiled this book just for nurses. It is for all clinicians who have an interest in this unique and fascinating speciality.

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Anatomy and Physiology of the Large Bowel (Colon) and Pelvic Floor

2

Alan Askari

In order to understand the pathological mechanisms that can affect the pelvic floor, one must first have an appreciation of its normal anatomy and physiology. The human pelvis is the anatomical region between the trunk and the thighs comprising of the **bony pelvis** and the contents contained within it (the **pelvic cavity**). The **pelvic floor** or **pelvic diaphragm** is an umbrella term used to describe a collection of muscles and connective tissue that form a saddle shaped muscular sheet that form the underneath or floor of the pelvic cavity.

2.1 Bones (Bony Pelvis)

The pelvis or more accurately, the bony pelvis is a compartment comprised of four major bones: *Ilium*, *Ischium*, *Pubis* and *Sacrum*. The *Coccyx* or 'tail bone' is part of the sacrum. The posterior aspect of the bony pelvis is formed by the sacrum whilst the lateral aspects are formed by the ilium and ischium on both sides. The pubis forms the anterior (front) of the bony pelvis, thus completing an oval shaped structure [1].

These bones are connected by strong connective tissue making the bones that form the bony pelvis, largely immobile. However, the decrease in mobility of the joints, gives the pelvis extra stability and therefore makes it ideal for weight bearing. The nomenclature of the joints follow the bones that they connect. Between the sacrum at the back and the ilium at either side, the joints are referred to as the **Sacrioiliac joints** (right and left). These joints are synovial (fluid secreting) joints and therefore allow a very small degree of mobility to the bony pelvis. Conversely, the **Pubic Symphysis** is a tough, fibrous join that connects the two pubic bones (right and left) and is therefore largely immobile [2].

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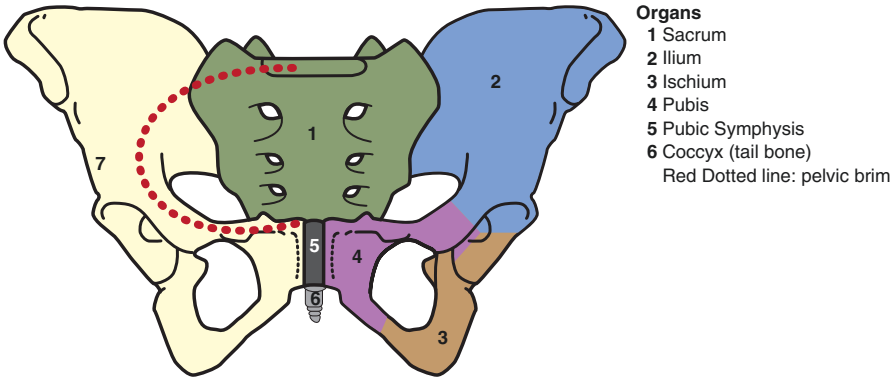


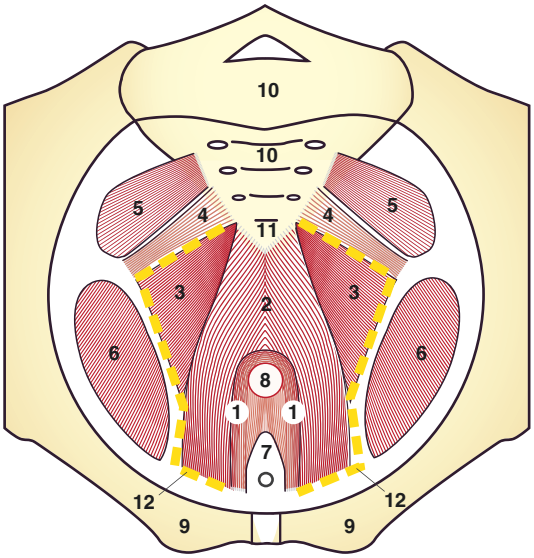
Fig. 2.1 The bony pelvis

The **Pelvic Brim** is an area extending from the upper edge of the pubic symphysis, across the inner aspect of the ilium and to the inner edge of the sacrum (called the **Sacral Promontory**) [3]. The pelvic brim denotes the line between the 'True' or 'Lesser' pelvis below it and the 'False' or 'Greater' pelvis above it. In males it is heart shaped [4], while in females, it is wider and oval shaped [5]. As a result, males have a narrower and smaller pelvic opening whilst females have a wider and larger pelvic opening for the purposes of childbirth. Generally, this makes pelvic and open surgery a little more difficult in males than in females, owing to the reduced space in which surgeons have to operate in males (see Fig. 2.1).

2.2 Muscles and Innervation

The pelvic diaphragm is comprised of two main muscles, the *Levator Ani* and the *Coccygeus*. Each of the muscles of the pelvic floor is supplied by nerves that originate from the spinal column, specifically, the *Sacral* branches of the spinal cord (*S2–S4* nerves).

- *Levator Ani:* The *Levator Ani* muscle itself is a collection of three muscles that are named after the bones that they attach to. They are supplied by the sacral nerve roots *S2*, *S3* and *S4* through the **pudendal nerve** and also directly from *S3* and *S4*. The three muscles that make up the Levator Ani are:
  - *Puborectalis:* attaches from the pubis anteriorly and slings around the rectum and attaches back to the pubic bone in a horseshoe shaped sling. The puborectalis is also innervated by the **pudendal nerve** and helps inhibit defecation when contracted and permits it when relaxed [6].
  - *Pubococcygeus:* attaches from the pubic bone anteriorly to the coccyx (tail bone) posteriorly. The pubococcygeus is innervated directly by branches of



1 Puborectalis muscle
2 Pubococcygeus muscle
3 Iliococcygeus muscle
4 Coccygeus muscle

Note: the first 3 = **Levator Ani**

Other muscles

5 Piriformis
6 Obturator Internus

Other muscles

7 Urethra opening
8 Anal opening
9 The paired Pubic bones - *front*
10 The Sacrum bone - back
11 The Coccyx or tail one
12 Tendinous arch

Fig. 2.2 Anatomy of the pelvic cavity

S3 and *S4* [7] and helps control urine flow and contracts during sexual orgasm.

- *Iliococcygeus:* attaches from the Ilium of the pelvis to the coccyx (tail bone) and is also innervated directly by the branches of *S3* and *S4* [7].

- *Coccygeus:* lies behind the *Levator Ani* muscles, attaching from the sacrospinous ligament and ischial spine to the coccyx and is innervated by *S4* and *S5* spinal nerves. The function of the coccygeus is to close off the posterior part of the pelvic outlet by moving the coccyx bone forward during defecation. The coccygeus is an important muscle in supporting the other organs of the pelvic cavity (particularly the uterus in females) (Fig. 2.2).

2.3 Organs of the Pelvis

A number of organs from a variety of systems including the gastrointestinal system, the urinary system and the reproductive system inhabit the pelvis. As such, the anatomy of the organs of the pelvis differs between the sexes. In both sexes the pelvis contains the rectum, the urinary bladder and the urethra. The bladder is the most anterior of the organs and the rectum is the most posterior. In between these two structures are the gender specific organs. In males, the space between the urinary bladder and the rectum is occupied by seminal vesicles, whilst in females, the uterus (womb) occupies this space. There is also a (potential) space between the uterus and the rectum, often referred to as the Rectouterine Pouch or 'Pouch of Douglas' [2]. The pelvic floor muscles form a hammock like sling containing all of these organs (Figs. 2.3 and 2.4).

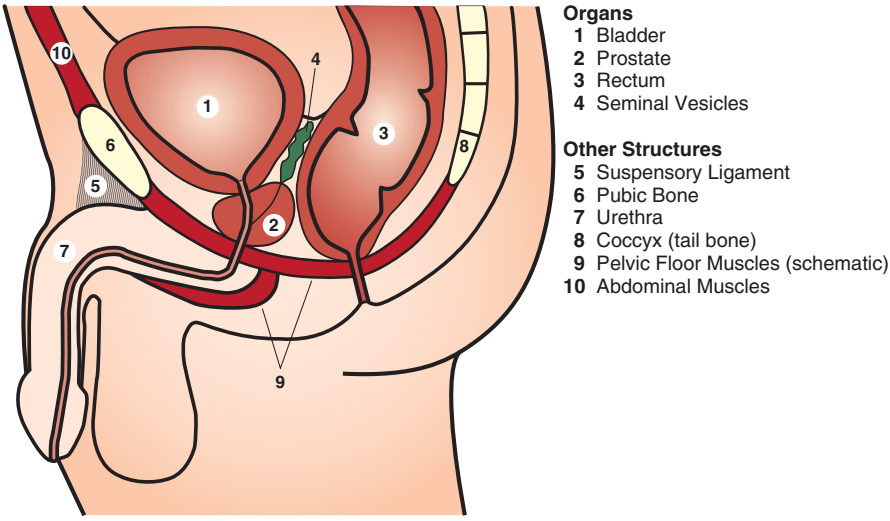


Fig. 2.3 Sagittal side cavity view of the anatomy of the male pelvis

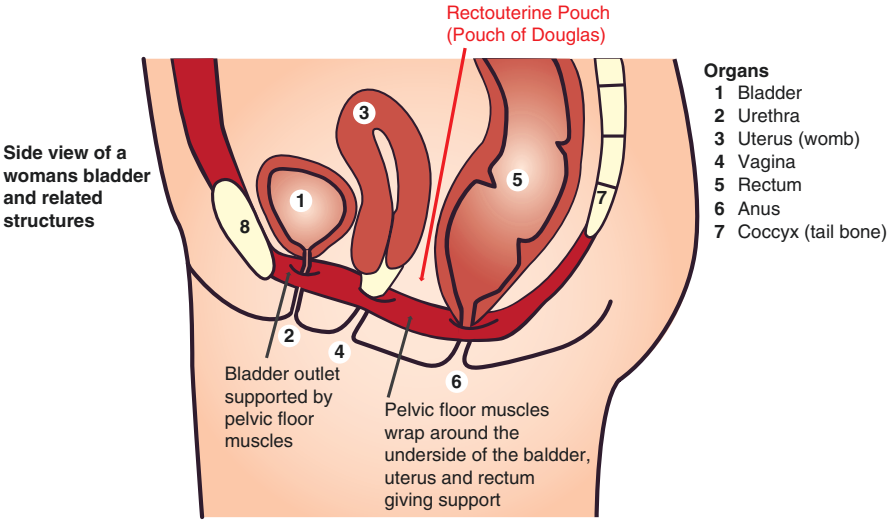
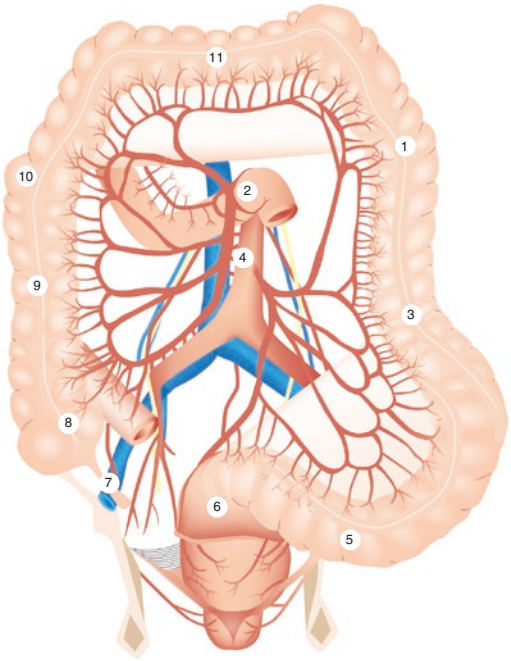


Fig. 2.4 Sagittal side view of the anatomy of the female pelvis

2.4 The Colon and Rectum

2.4.1 Gross Anatomy

Although not largely placed in the pelvis an appreciation of the anatomy of the colon is important in understanding the pelvic anatomy and physiology. The colon or 'Large Bowel' or 'Large Intestine' is a tubular structure of around 1.5 m in length



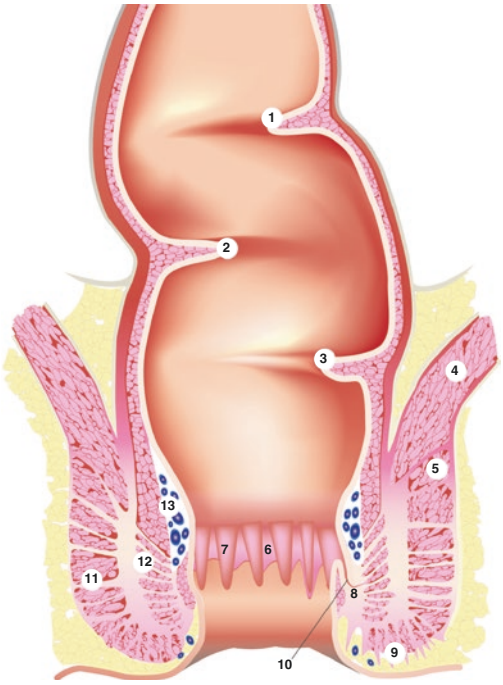
1 Left (Splenic) Flexure
2 Superior Mesenteric Artery (SMA)
3 Descending colon
4 Inferior Mesenteric Artery (IMA)
5 Sigmoid colon
6 Rectum
7 Appendix
8 Caecum
9 Ascending colon
10 Right(Hepatic) Flexure
11 Transverse colon

Fig. 2.5 Anatomy of the colon and rectum

(see Fig. 2.5). The diameter of the large bowel varies in size from one part of the large bowel to another, however, the average diameter is around 6–8 cm. The colon follows on from the small bowel and starts at the *ileo-caecal valve,* terminating at the *rectum*. Different names are given to the different part of the colon.

The first part of the colon is the *caecum*, to which the appendix is attached [8]. The colon then climbs up forming the *ascending colon* and it occupies the right side of the abdomen. As the colon approaches the liver, it takes a turn towards the midline, this region is called the *right* or *hepatic flexure*. After which, the colon continues towards the midline and is called the *transverse colon,* until it reaches the spleen on the left side where it takes a downward turn. This region is referred to as the *left* or *splenic flexure* [8]. From here, the colon continues downward, occupying the left side of the abdomen and is referred to as the *descending colon*. The final part of the colon is called the *sigmoid colon*. After which, the colon joins with the *rectum* to form the *rectosigmoid junction* at the level of the S3 spinal vertebra [1]. The musculature of the colon is designed in such a way as to produce a series of pouches or *haustra*, giving the colon the appearance of a series of interconnected segments. These haustra are important in moving faeces along the colon. There are also three ribbons of smooth muscle referred to as *teniae coli* which also aid colonic motility.

The rectum is a 12–15 cm muscular organ that is continuous with the colon (see Fig. 2.6). Its diameter is similar to the sigmoid colon (approximately 7–8 cm). The rectum does not contain haustra and by this point the teniae coli merge with



1 Superior rectal valve
2 Middle rectal valve
3 Inferior rectal valve
4 Levator ani muscle
5 Deep external sphincter
6 Rectal column
7 Rectal sinus
8 Perianal gland
9 Subcutaneous external sphincter
10 Anal crypt
11 Superficial external sphincter
12 Internal sphincter
13 Internal hemorrhoidal plexus

Fig. 2.6 Anatomy of the rectum

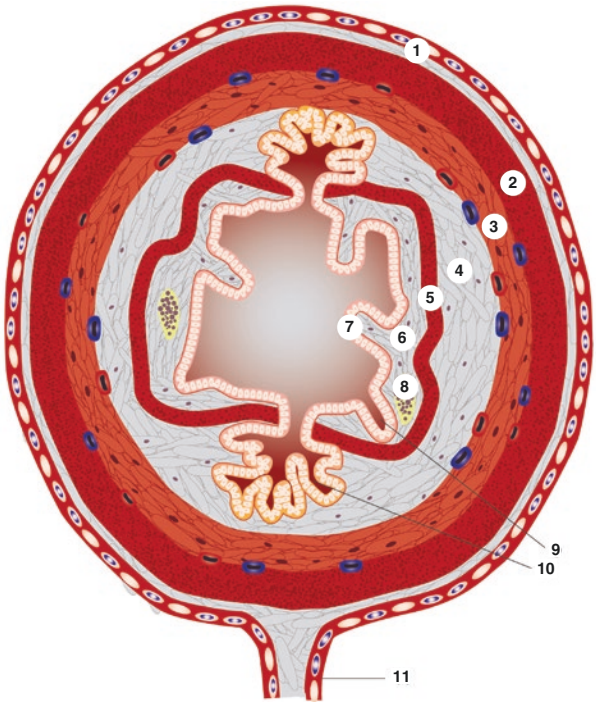
each other to form one continuous longitudinal layer. Transverse folds called *Houston's Valves* protrude into the lumen of the rectum and their function is to support the weight of faecal matter prior to defecation. Furthermore, the rectum has a series of adjacent vertical folds called *Columns of Morgagni* (sometimes referred to as 'anal columns').

The rectum becomes continuous with the anal sphincter muscles; the *external* and *internal anal sphincter*. The external sphincter is under voluntary (conscious) control, whereas the internal sphincter is not [7].

2.4.2 Layers of the Colon

There are several layers to the colon, each adapted to carry out a unique function:

- **Mucosa:** forms the innermost layer. A delicate, highly vascular layer that contains mucous glands to lubricate the surface and protect it from rough foods. It is lined by a thin columnar epithelium which is in contact with the colonic content. The mucosa is covered in many species of bacteria which are required for the processing of certain foods. This collection of bacteria is referred to by many names including *Microbiota, Microflora* or *'gut flora'*. The mucosa also permits nutrient and water absorption [1].



1 Serosa
2 Longitudinal muscle
3 Circular muscle
4 Submucosa
5 Mucosa muscle
6 Mucosa
7 Epithelial lining
8 Lymphoid tissue
9 Mucosal gland
10 Submucosal gland
11 Mesentery

Fig. 2.7 Cross sectional anatomy of the colon

- **Submucosa:** the submucosa contains blood vessels nerves, connective tissue and lymphatics. It houses the body's immune cells to prevent bacteria from the microflora spreading beyond the bowel.
- **Muscularis Externa:** a strong muscular layer that helps with gut motility and protects the more delicate layers.
- **Seorsa:** a layer of connective tissue, gives structural support to the bowel.
- **Mesentery:** the mesentery is a membranous layer that covers blood vessels and lymphatics that supply the colon (Fig. 2.7) [1].

2.4.3 Arteries

There are two main arteries that supply the colon: the *superior* and *inferior mesenteric artery* [8]. Both of these vessels originate directly from the aorta. The superior mesenteric artery (SMA) supplies the majority of the colon, from the caecum all the way to the splenic flexure. From here, the inferior mesenteric artery (IMA) supplies the rest of the colon. The blood supply to the rectum is from two sources, one is the IMA and the other is from the internal iliac artery [8]. The IMA, having supplied the left colon, continues to the rectum to become the

superior rectal artery and supplies the top part of the rectum. The inferior part of the rectum is supplied by the *inferior rectal artery,* which is itself a branch of the internal iliac artery [8].

2.4.4 Veins

Venous drainage from the colon and the rectum mirrors the arterial supply. An extensive network of smaller veins feed into the *superior* and *inferior mesenteric veins.* The superior mesenteric vein drains into the hepatic portal vein (which carries blood and with it, nutrients to the liver for processing) and the inferior mesenteric vein empties into the splenic vein which itself also drains into the hepatic portal vein [8].

2.4.5 Lymphatics

The colon and rectum contain hundreds of lymphatic vessels and nodes. These structures largely follow the arteries. Lymphatic drainage from all of the colon and the proximal 2/3 of the rectum is into the *para-aortic* lymph nodes. The last 1/3 of the rectum is drained by lymphatics that empty into the *internal iliac* and the *inguinal* lymph nodes.

2.5 Colorectal Cancer and Anatomy

A full appreciation of anatomy is important in any surgery, however in colorectal cancer surgery, it is vital. Cancer cells can spread throughout the body from their origin through a variety of routes, one of which is lymphatics. Therefore, whilst removing a segment of colon afflicted by cancer, removal of the surrounding lymph nodes are also important as they may harbour cancer cells. Similarly, enlarged lymph nodes in the inguinal region in a patient with rectal cancer may signify spread of rectal cancer to these nodes [8].

Colorectal cancer can also distort the anatomy of the colon and the rectum depending on the size and stage of the tumour. Some tumours are bulky and cause significant changes in the normal anatomy of the bowel. Furthermore, cancer therapy itself (such as chemotherapy and radiotherapy) can cause colorectal scarring which in turn alters the normal anatomy of the bowel and rectum [2].

2.6 Pelvic Floor Weakness

Damage to the nerves supplying the pelvic floor muscles or damage to the muscles themselves can result in dysfunction of the muscle and ultimately weakness in the pelvic floor. This is particularly the case when puborectalis is damaged as this muscle plays a vital role in faecal continence [9]. Childbirth, chronic coughing and surgery

are the most common causes of damage to the muscles and nerves. In childbirth, the foetal head is largely supported by the Levator Ani muscles and therefore these muscles as well as the nerve supplying these muscles (pudendal nerve, S2–S4) are at risk of injury [2]. Chronic coughing (which can occur in a variety of lung diseases) causes forceful downward movement of the abdominal organs into the pelvis, resulting in excess stress on the pelvic floor and if the coughing is persistent over a long period of time, it can weaken the pelvic floor [9]. Pelvic surgery (for whatever reason) can also contribute to damage and dysfunction of the pelvic muscles and nerves [6].

2.7 Colonic Physiology

The primary function of the colon is to mobilise faeces towards the rectum after the relevant nutrients and water is absorbed from it. The colon receives approximately 9 Litres of fluid a day (2L in the form of food and approximately 7L in the form of secretions). Remarkably, it is able to re-absorb over 90 % of the fluid contained in its lumen, resulting in a little over 300 mls of fluid loss through faeces. It also plays a significant role in nutrient processing and absorption. This is achieved mainly via the help of the 500–1000 species of bacteria collectively called the colonic or gut *microbiota* that covers the lumen of the colon [10].

2.7.1 Colonic Microbiota

The microbiota is a vast and complex ecosystem, consisting of trillions of bacteria. The number of bacteria in the microbiota is over ten times the total number of cells in the human body itself. It is also referred to as the 'gut flora' and it varies from one individual to another depending on the person's genetic make up, diet and lifestyle. It also changes in composition in the same individual during different stages of a person's life or when exposed to different environmental factors and diets [10].

Colonic microbiota has several important functions including the digestion of carbohydrates that the body would otherwise not be able to digest, including certain starches, fibre, oligosaccharides and some sugars. They also help ferment carbohydrates into usable compounds, thereby producing molecules that can be used as an energy source. Other important roles are the absorption of Vitamin K, a molecule that is essential for a variety of roles, including blood clotting. Furthermore, the presence of the 'good' bacteria of the microbiota prevents pathogenic or 'bad' bacteria from colonising the colon and causing illness. Without the microbiota it is unlikely that humans would survive [10].

2.7.2 Colonic Peristalsis

Peristalsis is a coordinated muscular contraction and relaxation of an organ with the aim of moving substances along its tract. Both the oesophagus and the colon are

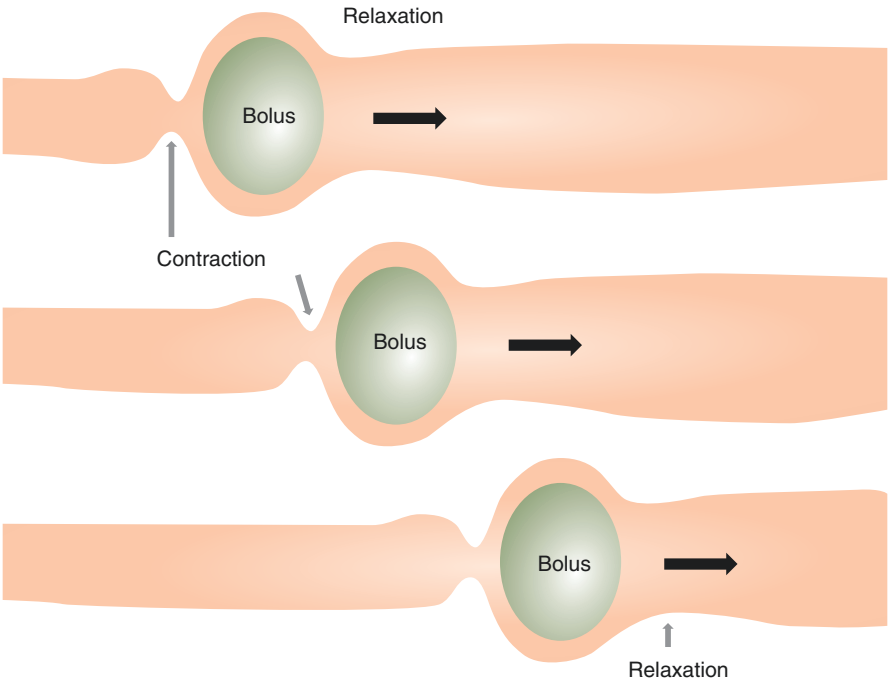


Fig. 2.8 Mechanism of peristalsis of the bowel

well equipped to perform this action. Peristalsis ensures that the movement of substances across in one direction (in the case of the colon, towards the rectum) and also play an important role in churning and mixing the contents of the lumen of the colon. The action is coordinated by the interaction of the nervous (Myenteric Plexus) and hormonal systems and occurs as a series of steps [11]:

1. the presence of a bolus in the colon distends the colon
2. distension is detected by receptors in the colon wall
3. receptors send a signal to the Myenteric plexus
4. the myenteric plexus signals smooth muscle fibres before the bolus to contract
5. at the same time, the myenteric plexus signals smooth muscle fibres after the bolus to relax
6. this contraction before the bolus and relaxation after the bolus ensures that the bolus moves in a single direction (towards the rectum) (Fig. 2.8).

2.7.3 Propulsion (Mass) Movements

As well as peristalsis, the nervous system produces two to three 'Propulsion' or 'Mass Movements' in the colon a day. These movements are large-scale contractions that are initiated by the parasympathetic nervous system, typically after eating and force colonic

contents towards the rectum at a faster rate than peristalsis. Similar to peristalsis, the colon distal (after) the colonic content relaxes and the colon before (proximal) to the colonic content contracts, resulting in a forward movement of the colonic content.

2.7.4 Transit Time

The time it takes for food to go through the digestive tract (from ingestion to defecation) is referred to as the *transit time*. The 'normal' time is uncertain as there is a great degree of variation amongst the population and anything between 48 and 72 h has been reported as 'normal'. On average, it is around 48–55 h, with males having a faster transit time than females (33 h in males, 53 in females) [12]. However, it is important to stress that transit times outside of these ranges are not automatically an indication of abnormality, although more than 72 h raises a suspicion of delayed a slowed bowel function [13].

2.8 Rectal Physiology

The main purpose of the rectum is to store faeces and control defecation. The defecation process involves two main aspects, a sensory and a motor. Sensory receptors in the mucosa of the rectum have an incredible ability to not only detect the presence of a substance in the rectum but also discriminate as to the consistency of the substance. The rectum is one of the few organs in the body that is able to determine whether the contents of its lumen is solid, liquid or gas (or a combination).

2.8.1 The Anal Sphincters and Defecation

The anal sphincters are a pair of muscles that form the final part of the human digestive system. They are two distinctly separate muscles called the *Internal Anal Sphincter (IAS)* and the *External Anal Sphincter (EAS)*. The IAS is ring shaped and is approximately 5 mm thick and between 2.5 and 4.0 cm in height. It is entirely under involuntary control, yet it plays a vital part in continence by aiding the EAS in closing the anal opening. The IAS is innervated by automated nerve fibres originating from a network of nerves called the **superior rectal plexus** and the **hypogastric plexus** [14]. For the majority of the time, the IAS remains contracted, to prevent leakage of gas, liquid or solid from the rectum. The EAS is a larger muscle (8–10 cm in height) that surrounds the anus and the lower part of the rectum in an elliptical shape [3]. The upper edges of the muscle blend into the Levator Ani muscle, providing further strength. The muscle is under voluntary control, innervated by the **S2–S4** nerves originating from the spine. Like the IAS, the muscle remains contracted for the main part, closing off the anal orifice and preventing leakage. However, unlike the IAS, it can be contracted further by voluntary squeezing. Both of these muscles work closely to produce a pressure that his higher than the pressure in the rectum,

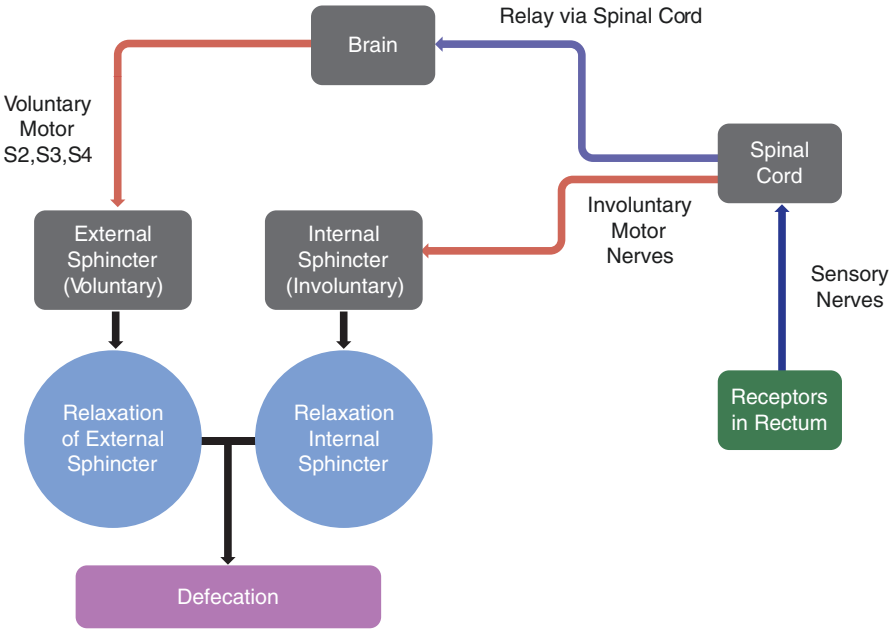


Fig. 2.9 The mechanism of defecation

thus preventing material leaving the rectum. This constant pressure that is generated by the combined effort of the muscles is called the ***resting pressure*** although the IAS contributes most to the resting pressure. The pressure generated in the anus can be increased further by voluntary squeezing of the EAS [15], this is referred to as the ***squeeze pressure***. As the EAS contracts (under voluntary control), it also prevents the relaxation of the internal sphincter, thereby preventing defecation [16]. The combined actions of the IAS and EAS are therefore vital components defecation process.

Defecation is the elimination of waste (faeces) through the anal canal and out of the body. The process starts with the presence of faeces in the rectum. The volume of faeces causes stretching of the rectum activating stretch receptors. A nervous signal is generated and travels to the spinal cord. From here, the signal is also relayed to the sensory cortex in the brain, making the person aware of the need to defecate. At the same time, the spinal cord also sends an automated signal to the internal anal sphincter to relax (this process is involuntary). However, in this instance defecation does not occur as the relaxation of both sphincters (the internal and the external) are required for defecation to take place. Only once the motor cortex of the brain (having been made aware of the urge to defecate by the sensory cortex) voluntarily sends a signal to the external anal sphincter via the S2–S4 nerves to relax, can defecation occur [17]. This is a learned response that humans undergo training for in childhood (‘potty training’). Damage to the pathways, either to or from the brain or in the brain itself (as a result of stroke for example) can reduce or eliminate voluntary control of the external sphincter, resulting in faecal incontinence (Fig. 2.9).

2.8.2 Rectal Threshold

Whilst in healthy adults, defecation is ultimately a voluntary process, there are instances when defecation can occur irrespectively. The sensory receptors in the rectum that activate the desire to defecate are present in multiple layers of the rectum: the mucosa, the muscularis and the serosa [2]. The intensity of the desire to defecate is therefore related to the volume of faces in the rectum [7]. The larger the volume, the greater the distension and the greater the number of receptors that are activated across the three layers. Typically, 50 mls of faeces are required to activate the receptors in the mucosal layer and a mild sensation of the urge to defecate is felt. Up to 200 mls of faeces will activate the muscularis layer of stretch receptors, producing a more intense sensation [7]. Once the distension reaches the serosal layer (>200 mls of faeces), the threshold reaches maximum and the pressure inside the rectal cavity will reach leaves higher than the pressure generated by the closure of the external sphincter muscles. In this instance, defecation will occur imminently even if the person voluntary has closed the external sphincter [7]. On average, the maximum pressure that the external anal sphincter is able to generate is 80 mmHg. In patients, with weakened anal sphincters (as a result of childbirth, trauma, surgery etc.), the pressure generated by these muscles will be lower, resulting in a smaller volume of faeces required in the rectum to overcome the external sphincter and cause involuntary defecation. As previously mentioned, most of the resting pressure generated comes from the IAS, whilst the EAS provides most of the squeeze pressure. Therefore poor resting pressure of the anal canal indicates a dysfunction of the IAS whilst poor squeezing pressure indicates EAS pathology [14].

2.9 Key Points

- The pelvic floor is a broad sheet of muscle composed of Levator Ani, Coccygeus
- The colon has two main arteries: superior and inferior mesenteric artery
- The microbiota or microflora contains 500–1000 species of bacteria to aid digestion and the processing of nutrients
- The colon is a very efficient ‘recycling’ organ
- Myenteric Plexus controls passage of faeces throughout colon
- Peristalsis and Mass Movements ensure that boluses move in one direction (towards rectum)
- Wide variation in ‘Transit Time’ amongst healthy individuals
- Receptors in the anal canal can distinguish between solids, liquid and gas
- The internal anal sphincter is under involuntary control, whilst the external anal sphincter is under voluntary control
- The internal and external anal sphincters generate resting and squeezing pressures to prevent leakage of faeces and gas
- Defecation is controlled by interaction between stretch receptors in the rectum, the spinal cord and higher brain functions
- Once the pressure in the rectum overcomes the pressure generated by the external anal sphincter, defecation will occur regardless of voluntary control

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The Epidemiology of Faecal Incontinence and Constipation

3

Patricia Evans

3.1 Definition

The Oxford Dictionary defines epidemiology as "the branch of medicine which deals with the incidence, distribution and possible control of diseases and other factors relating to health" [1]. It originated in the late nineteenth century from the Greek *epidemia* meaning 'prevalence of disease', plus 'ology' (the study of). In other words, the study of how often and why disease occurs in a population or group of people. This is a defined population to which all findings must relate [2].

How do epidemiologists choose the group of people to study? One of the key features is the measurement of disease outcomes in relation to a population at risk. This is composed of the group of people, healthy or sick, who would be counted as cases if they had the disease being studied [2].

A target population is one about which conclusions can be drawn. A full target population is only studied occasionally as it can be large and cumbersome. So, it is customary to define a simpler group with common characteristics, the study population, selected from the target population [2]. The actual study sample is chosen at random from the study population, this is thought to assure greater accuracy.

For example, in the Perry et al. study into prevalence of faecal incontinence in adults over 40 living in the community, the target population is all adults over 40 suffering faecal incontinence, the study population are those living in Leicestershire living in the community with that condition, from which the study sample was selected [3].

There are two commonly used terms of measurement in epidemiology, they are incidence and prevalence. Incidence is the rate at which new cases, or newly diagnosed cases, occur in the population within a specific period of time [2]. For example, the

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annual incidence of a disease would be the number of new cases reported per year from the general population. Incidence should not be confused with prevalence. Prevalence refers to the total number of cases, both new and long term, that are present at a particular point in time, usually expressed as a number/percentage [4]. It is the proportion of cases in the population at a given time, rather than the rate of occurrence of new cases. Thus incidence conveys information about the risk of contracting the disease, whereas prevalence indicates how widespread the disease is [5].

In this chapter we will be looking at the prevalence of both faecal incontinence and constipation, as well as considering the risk factors for the same, the cost both financial and personal to the individual as well as the nation.

3.2 Faecal Incontinence

Faecal incontinence (FI) is a physically and psychologically debilitating disorder which negatively impacts on quality of life. It is defined as the involuntary leakage of liquid or solid stool at a socially inappropriate time [6]. Anal incontinence (AI) extends the definition above to include the involuntary loss of flatus, this is found by many individuals to be equally disabling [7]. The loss of mucus can also be included in the definition of FI. Whitehead et al. report that patients with FI often do not report their condition to their health care providers and that the prevalence of FI is poorly documented.

3.3 Accuracy of Statistics

There is a consensus of opinion that the figures for the prevalence of Anal or Faecal incontinence are not a true representation of fact. The accuracy may be reduced due to underreporting of the condition and people's reluctance to report symptoms and avail themselves of treatment. Furthermore, there may be referral bias when the report comes from a single institution [7]. Women are more likely to report FI than men [8]. There is a further limitation to the data, in that the definition of FI and AI varies greatly between reports, there is lack of inclusion of a wide range of age groups and there is underrepresentation of minorities [7, 9].

3.4 Prevalence

3.4.1 In the Community Dwelling Population

In searching for current evidence it soon became apparent that there is a wide range in reported prevalence data for faecal/anal incontinence thanks to differing definitions of incontinence in terms of frequency and severity of symptoms. Prevalence of Faecal incontinence(FI) is reported as being over 10 % [9], with 1.4 % classifying their symptoms as severe, and 0.7 % suffer 'major FI with bowel symptoms that

have an impact on quality of life' [3]. However, the range can be up to 17 % for men and 25 % for women [10]. More recently a systematic review reported a range of 2–24 % for anal incontinence (AI) and 0.4–1.8 % for FI [11]. These figures serve to illustrate the challenges involved with suitably identifying those who have FI in the community. Sharma et al. [12] in New Zealand tried to estimate this by 3 scales of measurement: patient perceptions of a "problem with bowel control", their symptoms and their quality of life in the form of 3 different questionnaires. This was a postal survey of 2000 people 18 years and over randomly selected from the national electoral role. In the sample examined there was a combination of those who were continent, those who tested positive in all three questionnaires and were incontinent, and those who had a positive response in only one or two of the questionnaires. The authors assumed that 2 out of 3 positive responses constituted clinical AI. The total response was 68.7 %, of which 14.7 % felt they had a problem with bowel control; 12.4 % had FI (leakage of liquid or solid stool ≥1/month). In terms of quality of life, 26.8 % noted some impairment on the chosen Quality of Life Scale. In total 13.2 % of the sample reported at least 2 out of the 3 diagnostic measures, and the authors felt this may provide a way to incorporate the 3 measures into a new definition of FI. Their conclusion was that this highlights the difficulty in 'suitably identifying those who have FI in the community'. However, the prevalence of 13.2 % was a realistic measure of the burden of FI in the general population and recommended further research in that area [12].

3.4.2 In the Older Population

Ageing is one of the risk factors for FI/AI, so it is hardly surprising that the prevalence increases considerably in the older population. Whitehead et al. [9] estimated that the percentage of population affected by FI increases from 2.6 % in 20–29 year olds to 15.3 % in adults 70 years and older, Harari presented a range of 3–18 % for adults over 65 living at home, and Barucha et al. [13] an increase from 7 % at 30 to 22 % after 60, remaining steady thereafter. This illustrates yet again the variety of figures available, however, the trend in all estimates is a sharp increase. More than 50 % of those 65 years and older have not discussed their symptoms with a health professional, and of this cohort only a quarter would like to do so [14]. However, unfortunately it is still not routine for professionals to enquire about the symptom. This hidden problem very often leads to social isolation, psychological distress, dependency and poor health [15]. More often than not, the impact of FI in the frail older adult may affect not only the individual but also their carers. Therefore, many do not volunteer their health problem to the professionals as they are not only embarrassed, but also concerned they might be a burden to the carer. FI is one of the leading causes for requesting a nursing home placement, due to the psychological distress on their family and/or carers [16].

Prevalence increases to 30 % in the acute hospital setting, rising to 46–47 % in the nursing home [17, 18]. Chassagne et al. [19] studied a sample of 1186 continent nursing home residents over 10 months. They identified a 20 % incidence of de

novo faecal incontinence, and the most associated risk factors that would lead towards acquiring it, which were urinary incontinence, neurological disease, dementia, poor mobility and to be 70 years old or more. They also found that FI is associated with increased mortality having compared the survival rates with those of continent residents. At 10 months the mortality rate was 26 % for the incontinent, versus 6.7 % for the continent. A similar disadvantage is seen in patients with FI admitted to acute elderly care wards; [20], showed the mortality rate of 43 % in subjects with FI, compared with 16 % in continent ones. Thus incontinence in the elderly is common and may be indicative of poor and declining overall health in the nursing home context. The high prevalence of patients in long-term care with faecal incontinence has major cost implications [21].

3.5 Cost of Faecal Incontinence

It is estimated that the cost of incontinence (urinary and faecal) in adults accounts for about 2 % of the total annual healthcare budget in the UK. The annual NHS bill for treating and managing incontinent people is an estimate at £500 million. Annual costs of continence care for older people include £22 million for drugs, £58 million for appliances, such as anal plugs and faecal collectors, and £27 million for containment products such as absorbent pads and pants [22].

When it comes to costs to the individual these are more difficult to outline in financial terms. However, there is a great personal cost in terms of Quality of Life. FI can lead to social isolation, embarrassment, loss of employment, as well as intimate relationships and self-esteem [23]. The impact of this condition is influenced not only by severity, but also by many other factors including age, gender, lifestyle, occupation, cultural issues and personal values [16]. Brown et al. [24] assessed current perspectives and QOL among women with FI; interestingly they report that most women with this condition preferred the term accidental bowel leakage to describe it. They concluded that nearly 40 % report a severe impact on QoL and many endorse sentiments of wishing to get one's normal life back or feeling frequently depressed, indicating a negative impact on emotional well-being as well. The most common worries were smelling bad and having an accident in public. More frequent FI, urgency, passive soiling, weekly urinary incontinence and underlying bowel disorder (IBS or IBD) were positively associated with severe impact on condition specific QoL.

Even when asked, many women are reluctant to bring up the issue of sexuality with their healthcare professionals. Women with FI symptoms tend to have intercourse less frequently. Some studies have demonstrated that women with FI have lower sexual desire, satisfaction and worse sexual functioning compared to those without. Healthcare professionals should ask directly about the impact of FI on their sexual life, as the women are, on the whole, unlikely to initiate the conversation. This should be attempted in a compassionate, empathetic and non-judgmental manner [16].

3.6 Risk Factors for FI

Whitehead et al. [9] in their epidemiological study aimed to identify risk factors for FI. They observed that the most significant independent factors in women were advancing age, loose or watery stools (diarrhoea), more than 21 stools per week, multiple chronic illnesses and urinary incontinence. Independent risk factors for men were age, loose or watery stools, poor self-related health and urinary incontinence. They found that FI was not significantly associated with race/ethnicity, education, income or marital status after adjusting for age. They concluded that 'FI is a prevalent age-related disorder. Chronic diarrhea is a strong modifiable risk factor that may form the basis for prevention and treatment'.

Other risk factors which include Obstetric injury, obesity, surgery, neurological and other diseases will be fully addressed in Chap. 7.

3.7 Summary

Faecal incontinence is a devastating, debilitating condition which has profoundly distressing effects on sufferers. Milsom et al. [25] concluded that the risk factors for AI in each age group are still poorly defined, prevention research is a great distance away, randomised trials comparing vaginal delivery and Caesarean Section are needed as well as further epidemiological studies as data is still scarce.

3.8 Constipation: Definition, Prevalence and Epidemiology

3.8.1 Introduction

Constipation is one of the most common digestive complaints. It is not a disease, but a general term used to describe and individual's unsatisfactory and/or difficult experience in moving their bowels [26]. It is now accepted that there are 2 principle aetiologies for this: delayed transit through the colon and impaired evacuation of the rectum [27]. It can vary in severity from the slight which causes no disruption in life, to the severe adversely affecting the patient's quality of life and social functioning [28]. Constipation is a subjective account of the individual's bowel function, it is difficult to define as there is often a lack of agreement between healthcare professionals and their patient's perception of the problem [29]. Whereas, the professionals characterise constipation objectively using frequency of defaecation, with a normal range of between 3 and 21 bowel movements per week, as opposed to a variety of opinions and beliefs held by patients: for example, many individuals with fewer than 3 bowel movements per week do not consider themselves to be constipated, while others believe that a bowel movement each day is necessary for good digestive health [30]. In a study of 531 patients in general practice, 50 % gave a different definition of

constipation compared to their physicians [26], illustrating that constipation differs between individuals with a variety of bowel habits, symptoms and perceptions and makes any single definition difficult to use in clinical practice [31].

In light of this, an international group of experts during a conference in Rome met and the Rome diagnostic criteria for functional constipation were agreed on [32].

3.8.2 Prevalence in the General Population

The many definitions of constipation are reflected in part, in the wide range of data available. Although many population-based studies have sought to estimate the prevalence of constipation, the results are inconsistent because different criteria have been used [30]. Therefore, it is difficult to obtain an accurate estimate, also bowel patterns in individuals change over time confusing the picture further [33]. Another factor contributing to difficulty in estimating prevalence of constipation, is that it may occur chronically in some individuals, and it can be a short term transient condition in others. Estimates of UK prevalence range from 8.2 % to 52 % [34]. Chiarelli et al. [33] in Australia, conducted a large postal survey and found the prevalence was 14.1 % in young women (18–23 years), 26.6 % in middle-aged women (45–50 years) and 27 % in older women (70–75 years).

A systematic review found comparable prevalence rates between Europe, America and Oceania [35]. Another reported the prevalence of constipation worldwide to range from 0.7 % to 79 % (median 16 %) [36]. Interestingly prevalence rates using the Rome criteria are 18 % for Rome I, 12.7 % for Rome II and 11 % for Rome III [36]. It appears that with more stringent criteria the prevalence rate is reduced [37]. This illustrates how self – reported constipation is a highly subjective complaint influenced by cultural and social beliefs, it is neither specific nor sensitive enough compared to set criteria such as the Rome criteria, and many patients complaining about constipation do not meet the requirement for a diagnosis of functional constipation [30].

3.8.3 In the Older Population

The prevalence of constipation increases in pregnant women, 40 % complain of symptoms of constipation [38].

As seen in the Australian Study [33] the prevalence rises with age, affecting the elderly disproportionally, with a prevalence of 50 % in community dwelling elderly and 80 % in long-term care nursing-home residents [26, 39]. Elderly women are 2–3 times more likely to report constipation than their male counterparts [40]. However, Chiarelli et al. [33] found that only half the middle aged and older women who experienced constipation or haemorrhoids (associated with constipation) reported seeking help for these problems; this suggests that some women may see these symptoms as requiring assistance, whereas others do not, or indeed may be too embarrassed to do so.

Although the prevalence of constipation increases with age, ageing itself is not necessarily a risk factor [41]. Despite the ageing colon, age-related changes in the colonic anatomy and physiology are not considered to be major contributors to the development of constipation [42]. Despite the high rate of subjective constipation in older people, there is no reduction in actual frequency of bowel movements with ageing; 1–7 % of both young and older community-dwelling people report 2 or fewer bowel movements per week [41]. This consistent pattern in relation to age remains even after statistic adjustment for the greater amount of laxatives taken by the elderly [41]. However, a combination of co-morbid illnesses, polypharmacy and its side effects, psychosocial and behavioural factors such as decreased mobility, lack of appetite and anorectal sensation changes, may influence bowel function. Ignoring the call to defaecate can lead to faecal retention in the elderly [40]. By regularly suppressing rectal sensation, the individual may experience chronic faecal retention, and only perceive large stools which will lead to difficulty with defaecation [40].

Constipation is highly prevalent in nursing home residents, with 74 % taking daily laxatives [43]. These frail elders are at great risk of developing faecal impaction and overflow incontinence [41]. In fact, faecal impaction is the main reason for hospitalisation in 40 % of frail elderly people admitted to hospital [44]. As far back as 1995 it was speculated non-pharmacological approaches to manage constipation may be under-utilised in the nursing home setting [41, 45]. 20 years later conservative treatment of constipation is mentioned, but with the proviso that its efficacy in the elderly remains unclear, especially if there are significant co-morbidities and advanced dementia [26].

3.8.4 The Cost of Constipation

The economic burden of constipation is increasing over the years. Considering laxative use alone, in the 12 months to July 2007 the total cost of laxatives was almost £60 million with almost 14 million prescriptions filled in [46]. In 2010 the figure had risen to £70.6 million from 15.9 million prescriptions [47]. Recently the cost of laxatives had risen further to £101 million [48]. In the light of different myths and beliefs held by individuals and their reluctance to visit a health practitioner, the retail value of the purchase of over the counter laxatives is probably greater than those prescribed, since the NHS buys them wholesale, in bulk and presumably with a decent negotiated discount. Chiarelli [33] found that data from Australian pharmacies suggested a high use of self-help remedies for constipation.

One cost that doesn't easily spring to mind is that of hospital admissions: 66,287 people in the UK were admitted to hospital with constipation as the main diagnosis in 2014/2015 [48]; these admissions consist of 48,409 unplanned emergency admissions at £1542 per visit, 17,798 elective inpatients at £3375 per stay and 15,319 day cases at £698 per day. The estimated total cost of hospital admissions for constipation is £145,470,590 a fairly staggering figure (www.coloplast.com 2016).

Other indirect costs of constipation to society include a decrease in work related productivity, absences in college, lower quality of life and higher psychological distress [49]. Rao and Go [26] found evidence that constipation is associated with impaired quality of life, those suffering chronic constipation had lower scores for physical functioning, mental health, general health perception and bodily pain when compared to those with no constipation. Interestingly improvements in quality of life were noted with treatment of constipation; after laxatives caused significant increases in weekly bowel movements, patients reported fewer urinary symptoms, better sexual function and improved mood and depression [26].

3.8.5 Risk Factors

Barucha et al. [13] found in their review on constipation, that there was consensus agreement on the risk factors. Lower socioeconomic status and lower parental education rates are associated with constipation, as are less self-reported physical activity, polypharmacy, depression, physical and sexual abuse, and stressful life events [13]. They also found that dietary fibre had an arbitrary effect, in some individuals a low fibre diet was associated with constipation, and in others not.

In the elderly the risk factors include loss of mobility, medication, underlying diseases or co-morbidities, impaired rectal sensation, ignoring calls to defaecate which was felt to be as important as dyssenergic defaecation or Irritable Bowel Syndrome causing constipation.

There are other risk factors and they will be fully discussed in Chap. 5.

3.9 Summary

Constipation while being seen by many as a minor health issue, is in fact a debilitating and distressing condition, with far reaching consequences to the individual in terms of wellbeing, both physical and mental, the individual's self-esteem, and ability to work [49]. This has wider implications in terms of health economics and health seeking behaviours –it has become apparent that it is not purely a condition that affects the elderly. The current evidence points to the need for further and more stringent research to promote a greater understanding of this condition.

Conclusion

All of the studies discussed point to the need for further homogenous and stringent research into the prevalence of Faecal Incontinence and Constipation. We appear to be nowhere nearer to the true figure even to date. Studies like Sharma et al. [12] for faecal incontinence, which combines the patient's perceptions of a bowel problem, their symptoms and their quality of life, may afford a more realistic measure of the burden of functional bowel conditions. Much of the evidence cited by researchers is 10 years old or more, and may not reflect the present

circumstances given that we are an increasingly elderly population with an array of concomitant conditions. Certainly the advent of the ROME criteria has led to consensus agreement on classification for bowel dysfunction. This sets the scene for future research and acknowledges the complex aetiology and affects of functional bowel disorders on the individual.

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Investigations

4

Alex Dennis and Michelle Marshall

4.1 ARP Testing and Techniques

4.1.1 Introduction

Ano-rectal physiology allows the investigator to gain an insight into any underlying abnormalities that may be contributing to patients' symptoms. When considering faecal incontinence or constipation, symptoms alone are not enough to understand the pathophysiology of this type of functional bowel disorder. Ano-rectal physiology tests are performed with the aim of giving an understanding of the pathophysiology of the presenting condition, typically: faecal incontinence, constipation, ano-rectal pain or as an assessment pre/post-surgery.

Although physiology testing will vary between centre's they will include the same key measures. Manometry is used to assess anal function. Rectal function is tested using graded balloon distension. Further sensory function testing can be done using electrical sensitivity in the mid anal canal and rectum. Pelvic floor co-ordination may also be tested using the balloon expulsion test.

The focus of ano-rectal physiology testing is the rectum and anal canal. The rectum is typically 15–20 cm in length and sits between the recto-sigmoid junction and anal-canal [1]. The function of the rectum is to act as a reservoir to store faecal matter prior to defecation. The anal canal is positioned at the distal point of the rectum and is 2–4.5 cm in females and 2.5–5 cm in male patients [2]. In the healthy population the IAS will contract to maintain continence when the rectum fills.

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The striated muscle of the IAS are comprised predominantly of type 1 muscle fibres that are slow to fatigue and allows for the IAS to maintain a contraction and consequently continence [1].

It is important to understand the musculature contributing to resting and squeeze pressures before going into testing methods in more detail. The resting pressure of the anal sphincter is determined by three key components. Due to the complexity of the study done to determine these contributions should be considered estimates. The internal anal sphincter (IAS) contributes approximately 55 % to resting tone, 30 % is contributed by the external anal sphincter (EAS) and 15 % from the haemorrhoidal cushion [3].

4.2 ARP Testing

4.2.1 History

As with any medical assessment it is important to start each consultation by taking a thorough history. This will allow the practitioner to understand the symptoms the patient is experiencing and of these which is having the most significant impact on their quality of life. At this point it is a good opportunity to determine the duration of the symptoms as well as a trigger for the onset of these, for example: traumatic injury, obstetric injury or surgical procedure. Not all patients will have a clear reason for why they are experiencing symptoms. It is also a good chance to ascertain if the patient has any other comorbidities or if they are taking any medications that may be influencing they're continence.

As the practitioner there are also validated questionnaires available to quantify the severity of each patient's condition. The St. Marks incontinence score [4] (Fig. 4.1) is widely used and accepted as a method to evaluate the significance of faecal incontinence. This has since been evaluated and shown to correlate well with patients' perception of their condition, regardless of age, gender or type of incontinence [5].

The Cleveland Clinic Constipation score may also be used to evaluate constipation. This scoring system has also been found to correlate well with physiological findings in constipated patients [6].

4.2.2 Types of Catheter

The type of catheter used to perform manometry studies may vary between centres. Conventional manometry uses a multi-channel water perfused catheter which allows recordings along both longitudinal and radial axes [7]. More recently developments in technology have allowed for solid state high resolution and 3D high definition manometry [8].Currently the water perfused catheters are more durable, require little maintenance and are at less risk of malfunction [8]. However, it offers fewer sensors at larger intervals than the solid state e-sleeve catheter and further to this it is thought that the colour topographic display allows easier interpretation than the

St Marks Score

	Never	Rarely	Sometimes	Weekly	Daily
Incontinence to solid stool	0	1	2	3	4
Incontinence to liquid stool	0	1	2	3	4
Incontinence to gas	0	1	2	3	4
Alteration in lifestyle	0	1	2	3	4
				No	Yes
Need to wear pad or plug				0	2
Taking constipating medicines				0	2
Lack of ability to defer defaecation for 15 minutes				0	4

Never = no episodes in the past 4 weeks;
Rarely = 1 episode in the past 4 weeks;
Sometimes = more than 1 episode in the past 4 weeks but less then 1 per week
Add one score from each row;
Minimum score = 0 perfect continence
Maximum score 24 = totally incontinent

Fig. 4.1 St. Marks score

graphical line display of conventional manometry [8]. The primary limitations of the solid state catheter are its cost and fragility [8]. The multi-use nature of the solid state catheter also requires consideration regarding infection control and cleaning processes which will vary between centres. Studies have found their to be a good correlation between these methods [9].

4.2.3 Patient Preparation

There is no specific preparation needed for patients leading up to manometry testing [10, 11]. Patients can continue a normal diet prior to testing and studies can be performed whilst taking any prescribed medication. These medications should be documented when the patients history is taken.

4.2.4 Patient Position

Ano-rectal physiology testing is routinely performed with the patient in the left lateral position. The patients knees and hips should be bent to 90°[10].

4.2.5 Probe Placement

Probe placement is important as it will influence the results gained during testing. The lubricated catheter should be gently inserted into the rectum, whether using a conventional water perfused catheter or solid state catheter.

4.2.6 Sphincter Motor Function

The catheter should be inserted to at least 10 cm to ensure that the pressure sensors have passed the anal canal [2]. Catheters will be marked at 1 cm intervals to ensure accurate placement. Practitioners should then hold at this position for a 5 min stabilisation period [7, 10, 11]. This time allows the patient to become familiar with the sensation of the catheter and for the sphincter tone to return to basal levels [11].

The following measures of motor function should be performed with the catheter held at the point of high pressure. It is good practice for each measurement to be taken 2–3 times to ensure accuracy of results [7].

Maximum Resting Pressure The maximum resting pressure can be determined by holding the catheter in the high pressure zone for 20 sec (see Fig. 4.2) [10].

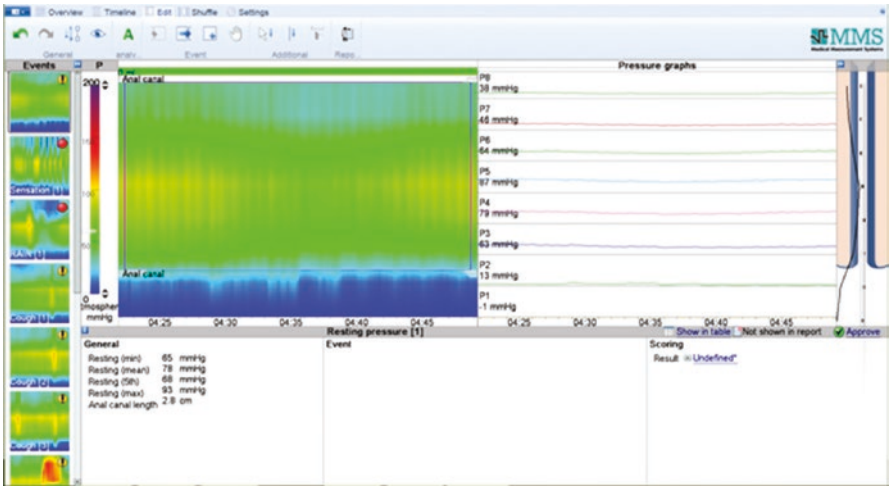

Fig. 4.2 A comparison of HRAM and line graph resting pressure traces (Images provided by Ardmore Healthcare Limited, England)

Peak Squeeze Increment This is a voluntary contraction of the external anal sphincter and should be measured as the increase in pressure above the previously determined resting pressure [10]. Normal ranges will be set by individual centres and depend on the catheter and software used. However, these ranges should reflect the lower normative range for women when compared to men and also in an older population in comparison to a younger population [12, 13]. Patients experiencing symptoms of faecal incontinence will typically have lower pressures than those with constipation [14].

Involuntary Squeeze Increment This measurement illustrates the relationship between intra-abdominal pressure and anal sphincter pressure [11]. Practitioners will use a cough to give an increased intra-abdominal pressure inducing a reflex contraction of the external anal sphincter.

This is an important element of the test as it can be used in combination with volitional squeeze pressures to determine any damage or impairment of motor control (see Fig. 4.3) [10].

Patients with poor voluntary squeeze pressures and normal involuntary squeeze pressures may be indicative of reduced control of the external anal sphincter or damaged central motor pathways above the sacral segment of the spinal cord [10]. If both voluntary and involuntary squeeze pressures are reduced this may indicate a defect in the sacral reflex arc [10].

Endurance Squeeze Increment: At St. Marks we do this as a measure of muscle fatigue. We have found that a low endurance squeeze often correlates with reported symptoms of urgency and urge incontinence.

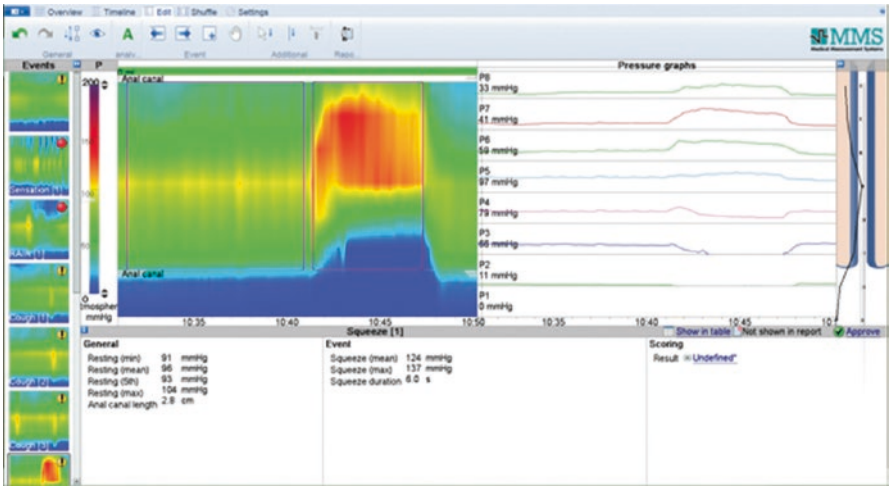

Fig. 4.3 A comparison of HRAM and line graph squeeze pressure traces (Images provided by Ardmore Healthcare Limited, England)

4.2.7 Sensory Threshold Testing

The evaluation of rectal sensation will be completed by the controlled distension of a balloon. Many manometry catheters will now have a balloon attached as standard, however, this testing may also be carried out with a hand held syringe and polysoprine balloon. This test is used to simulate the presence of faeces in the rectum.

Prior to the test the patient should be instructed of the sensations that they will need to alert the practitioner to. There are three sensations that patients are asked to report:

- Threshold Volume: The first point at which the patient is aware of a change in rectal sensation.
- Urge Volume: The point at which the patient would normally evacuate their bowels.
- Maximal volume: The point at which the patient could not tolerate any more distension, when they would have to rush to the toilet.

Practitioners should ensure that the balloon is inserted into the rectum to elicit the most accurate results. Normal ranges for rectal sensitivity are dependent on the stiffness and configuration of the balloon [10]. These ranges will be determined by individual centres (book). Practitioners should be aware of the maximum volume that the balloon can safely be inflated to and should not exceed this during testing.

Simulated Defecation Following the sensory threshold testing a balloon expulsion test can be performed. During this manoeuvre the patient is asked to bear down in an attempt to expel the balloon. The balloon should be filled with ~50 ml of air for this part of testing [10]. Due to this part of the test being performed in the left lateral position not all patients will be able to expel the balloon. However, the practitioner will be able to observe the effort of the patient during this test. If the patient is seen to be squeezing (paradoxical contraction) rather than pushing, biofeedback can be used to improve pelvic floor co-ordination (Book).

4.2.8 Mucosal Electrical Sensitivity

Further sensory threshold testing can be performed on the mucosa of the anal canal and rectum. This sensation is tested using electrical stimulation which can be applied using a bi-polar ring electrode. The difference between the more afferent nerve endings of the anal canal, which are more sensitive to pain and touch, and the rectal mucosa that will recognise the sensation of fullness and urgency [15] dictates that the stimulation parameters should be adjusted accordingly.

Mid Anal Electrical Sensitivity The catheter is positioned 1–2 cm above the anal verge. To apply stimulus to the mucosa is increased at a frequency of 5 Hz. The current is then gradually increased to the point at which the patient first has a change in

sensation. This procedure is repeated 2–3 times to ensure consistent recordings, the lowest amplitude should be taken and reported in mA [16].

It has been reported that abnormalities in anal sensation are demonstrated in patients with faecal incontinence and fissures in-ano [15].

Rectal Electrical Sensitivity Following anal sensation testing the catheter should be advanced into the rectum, 6–7 cm above the anal verge should be adequate. The stimulus is again increased gradually, on this occasion at a frequency of 10 Hz. The patient should again report the first change in sensation which will typically be an ache or sensation of fullness.

In patients with constipation there is a significant correlation between balloon distension values and rectal sensation [16]. Patients with severe idiopathic constipation can have raised sensory threshold indicative of rectal sensory neuropathy [16].

Electrical sensitivity testing should not be performed on patients who are pregnant.

4.2.9 Recto-Anal Inhibitory Reflex (RAIR)

The recto-anal inhibitory reflex (RAIR) is a key characteristic of a healthy bowel and contributes to maintaining continence. Practitioners have been aware of this reflex since it was first outlined by Gowers in 1877 [17]. It was later confirmed by Denny-Brown and Robertson in 1935 [18] who highlighted it to be a critical aspect of maintaining continence. The RAIR is an anal reflex response characterised by the transient relaxation of the anal canal following distension of the rectum (see Fig. 4.4) [19].

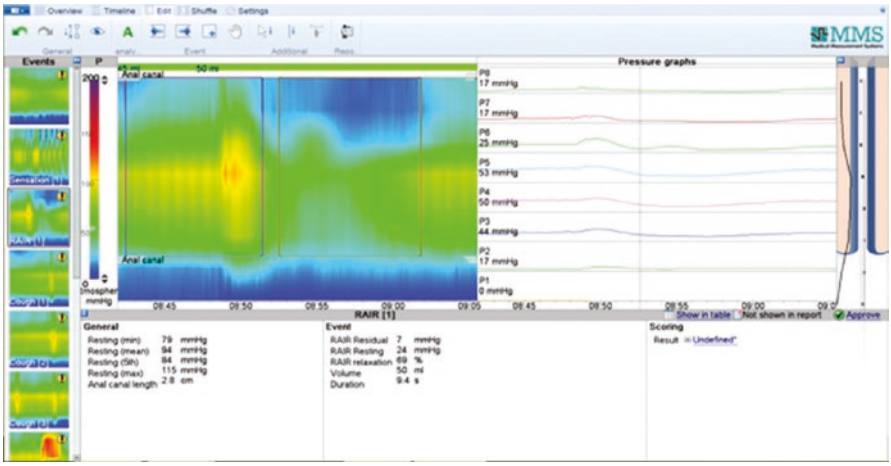

Fig. 4.4 A comparison of HRAM and line graph for RAIR test pressure traces (Images provided by Ardmore Healthcare Limited, England)

As the RAIR is an involuntary reflex it is important to understand some of the neurology that controls the ano-rectum. On a neurological level there is continuous communication taking place between the anal canal, rectum and central nervous system [20]. The manoeuvre of defecation is controlled by a spinal reflex whereas if the rectum is full then the ability to maintain continence requires contraction of the EAS voluntarily [20]. The neurological process of the RAIR takes place in the supra-spinal and parasympathetic centres [21]. The RAIR test is primarily used to aid in the diagnosis of dysganglionosis and specifically Hirschprung's disease [7].

In the adult population the test for the RAIR will be performed on patients who have symptoms of chronic constipation. At centres using water perfused catheters the catheter will be inserted into the anal canal and held at the point of the highest resting pressure. This position can be determined during the manometry testing. The balloon used for the distension element of the test should also be introduced at this point and positioned in the rectum; the balloon may already be in situ following the sensory function testing. Studies have shown that increasing the volume of balloon distension will give a larger amplitude and longer duration of RAIR up to 71cc distension [19], no further decrease in anal pressure is seen past this volume [19]. A volume of 50 ml will tend to be enough to elicit the RAIR [2]. To perform the test the catheters should be held in the position outlined above, the balloon can then be distended to 50 ml and then deflated in one smooth motion [2]. Practitioners may wish to perform this process 2–3 times to be satisfied with the result.

4.3 Conclusions

Ano rectal manometry testing is now performed by practitioners to gain a greater understanding of the pathophysiology of conditions including faecal incontinence, constipation and anal pain [11]. These investigations will often be supplemented by further tests such as endo anal ultrasound, proctogram, and transit studies [11] to aid in the management and treatment of the patient.

As outlined throughout this chapter centres are continuing to develop their own normative ranges. Numerous factors contribute to these differences such as catheter type (solid state/water perfused) and protocols which vary widely between published literature. Developments have been made in the uniformity of manometry testing performed on the oesophagus in recent years with the development of the Chicago Classification [22]. The need to establish normative datasets and the standardisation of ano rectal manometry is needed and recognised by many leading gastroenterologists [22].

Until such data is gathered and normative ranges are developed centres should continue to develop their own ranges.

4.3.1 Imaging in Pelvic Floor Disorders

4.3.1.1 Abdominal Radiograph and Transit Marker Studies

Plain abdominal radiographs are commonly thought to be useful in constipation. In fact, the presence of a large amount of faecal material through the colon is

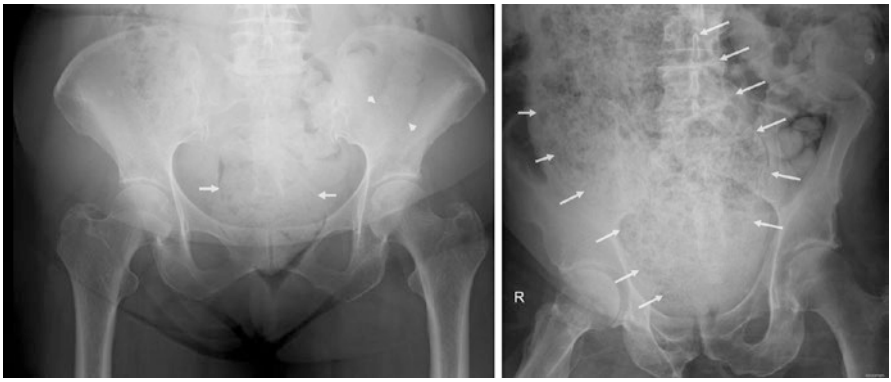

Fig. 4.5 (**a**) Plain radiograph showing distended faecally loaded rectum but normal sigmoid colon (**b**) Plain radiograph showing hugely distended faecally loaded rectum in keeping with congenital megarectum

especially seen in patients with a normal bowel habit but high fibre diet, or those taking methylcellulose. The only indication for an abdominal radiograph in constipation is to exclude a congenital megarectum or megacolon in patients with intractable constipation (Fig. 4.5).

Transit marker studies are used to assess whole gut transit time. Three different shapes of metallic markers enclosed in a gelatin capsule are given on three consecutive days and a single abdominal radiograph is taken on day 5 (120 h). Markers are taken on three days so that the impact of a low frequency of bowel evacuation is negated [23]. The most useful role is in chronic constipation where a normal whole gut transit time effectively excludes a diagnosis of obstructed defaecation syndrome (Fig. 4.6).

4.3.1.2 Endo Anal Ultrasound

Ultrasound is a specialist test, and in this area a very specialist examination. There is a steep learning curve which limits it's use to practitioners who are able to see a good number of patients. Perhaps because of this, it is now largely used by surgeons and specialist nurses in pelvic floor services. It was developed at St. Mark's hospital by Prof Clive Bartram as an adaptation of one of the only specialist endo-rectal ultrasound machines at the time in the nineteen eighties [24].

Modern equipment can now do more than create a single cross sectional image, but can reproduce images in multi planar displays and also assess the compliance of tissues using elastography [25].

It is a simple procedure, taking only about 5 min, and involves placement of a probe in the anal canal, which is between 15 and 22 mm in diameter. It's main role is in incontinence, where it's use in conjunction with anal physiology and digital rectal examination allows a reasonable prognosis and treatment plan to be determined. Obstetric injury needs to be identified and quantified in order to determine value of secondary surgical repair compared to conservative management. Combined or isolated sphincter deficit is of particular importance as well as the length of the anal canal remaining intact.

Fig. 4.6 Transit study: three different marker sets all delayed also demonstrating a permanent sacral nerve stimulator and a naso- gastric tube

As well as assessment of obstetric injury, it is useful in determining the effective length of a sphincterotomy in patients with recurrent fissure and for assessment of surgical options in perianal fistulae or perianal trauma (Figs. 4.7, 4.8, 4.9, 4.10 and 4.11).

4.3.1.3 Perineal Ultrasound

Traditional transcutaneous ultrasound has been used with high resolution imaging to assess the anterior pelvic floor. More recent developments have shown it to be a simple and effective method for demonstration of distal rectal intussusception and rectocoele with 3D reconstruction acquired during strain and squeeze. Ongoing research may provide better understanding of functional significance which is not a direct extrapolation from anatomy [26].

4.3.1.4 Proctography (Evacuation Proctography (EP), Defaecating Proctography)

This technique simulates normal defaecating by filling the rectum with a radio-opaque substance (contrast) to distend the rectum. The main value of this examination is that it can give a good insight into the functional element of evacuation. Images are acquired in a lateral projection as the patient is asked to evacuate the administered contrast enema into a bedpan arranged under a dedicated commode.

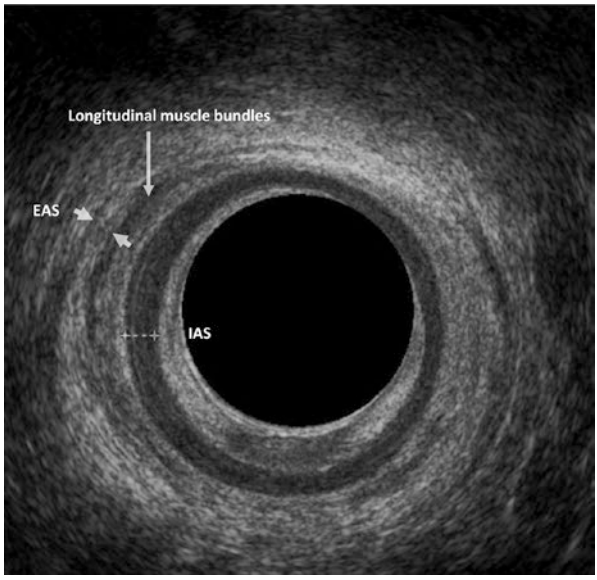

Fig. 4.7 Normal anatomy on endosonography External anal sphincter(EAS) Internal anal sphincter(IAS)

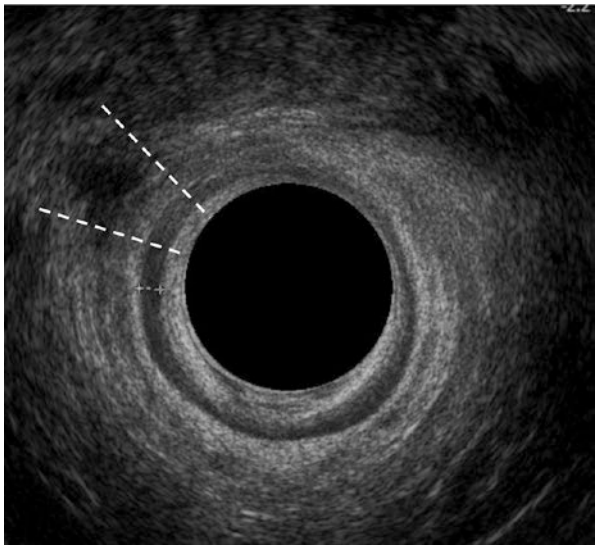

Fig. 4.8 Isolated external sphincter defect

Many authors have suggested the technique is fundamentally flawed. It is true the technique is not simulating the whole pathway of defaecation, which starts with colonic propagative contractions in order to fill the rectum and likely influence the relaxation of elements of the pelvic floor musculature facilitating rectal emptying. However, it has been consistently shown that certain patterns of evacuation are present in patients with defined pathology, and moreover that these patterns of pelvic floor function or dysfunction can be transformed to a more accepted normal pattern with both surgical and no surgical interventions.

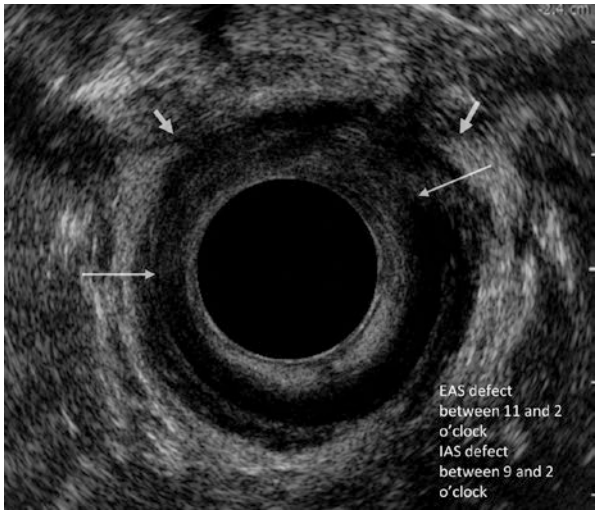

Fig. 4.9 Combined sphincter defect

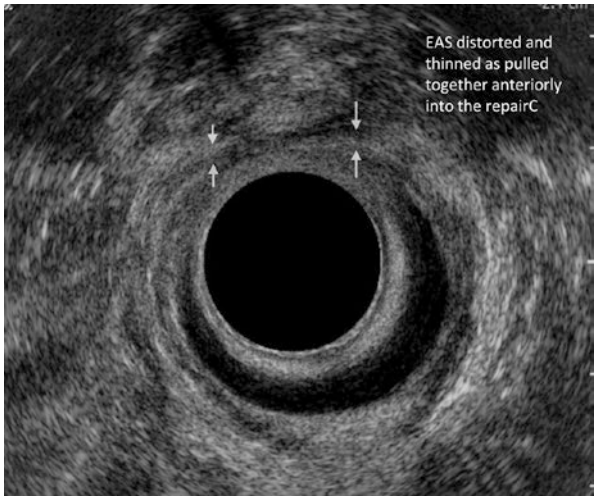

Fig. 4.10 Combined and primary external sphincter repair

The contrast is a mixture of barium sulphate, a substance used in many GI radiological examinations and something to give bulk to the material. Most departments now use a combination of barium sulphate powder, porridge and water to make a consistency which can be introduced using a bladder catheter syringe. Images are acquired most commonly using real time capture of a video output during fluoroscopic imaging. This allows for a lower overall radiation dose, which is important consideration as many patients are women of child bearing age. It remains a high dose examination and therefore should only be requested as part of a clear diagnostic strategy aimed at answering a specific question.

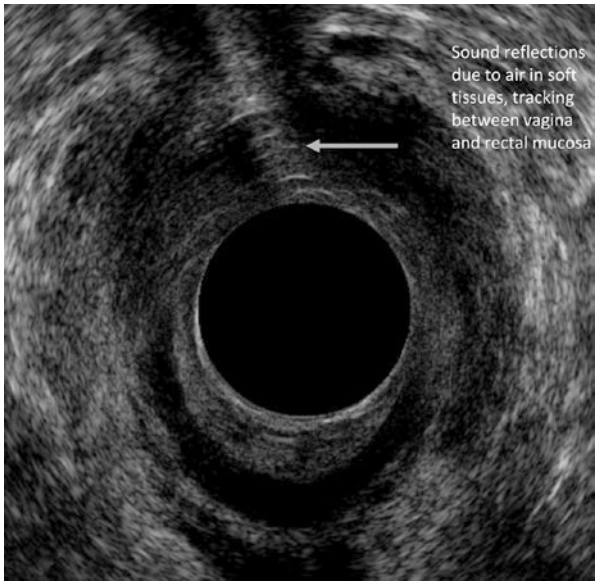

Fig. 4.11 Ano-vaginal fistula

The main indication for proctography are:

1. To exclude or confirm anismus in patients with obstructive defaecation syndrome or anterior rectocoele
2. To assess/exclude intussusception in patients complaining of incomplete evacuation (Figs. 4.12, 4.13, 4.14 and 4.15).

4.3.1.5 Magnetic Resonance Imaging (MRI)

There is a developing role of MRI in functional gut disorders and in particular in pelvic floor disorders. In terms of strengths, it is an imaging technique capable of the most detailed and accurate delineation of anatomy. However, the technique is reliant on long acquisition sequences and the patient is often required to lie still for periods of up to 40 min. Newer techniques focus on short sequences looking to emulate conventional x ray studies such as Evacuation proctography.

Many departments now use MRI proctography in favour of conventional EP. It must be recognized that these studies are acquired in a supine position, so the ability of the test to simulate normal physiological conditions and anatomical movements with accuracy must be questioned. That said, it has been shown to be able to demonstrate a number of abnormalities relevant to the management of pelvic floor disorders. The most useful of these is for pelvic crowding, and in combined anterior and posterior pelvic floor dysfunction.

It is the examination of choice in the assessment of peri-anal sepsis, due to the high sensitivity for detection of fluid containing tracks and persistent tracks of infection likely to lead to recurrent disease if not identified and cleared at surgery.

It can be useful in assessing patients with incontinence, with a suspicion of occult perianal sepsis, either clinically or on endoanal ultrasound (Fig. 4.16).

Fig. 4.12 Normal rectal position at rest

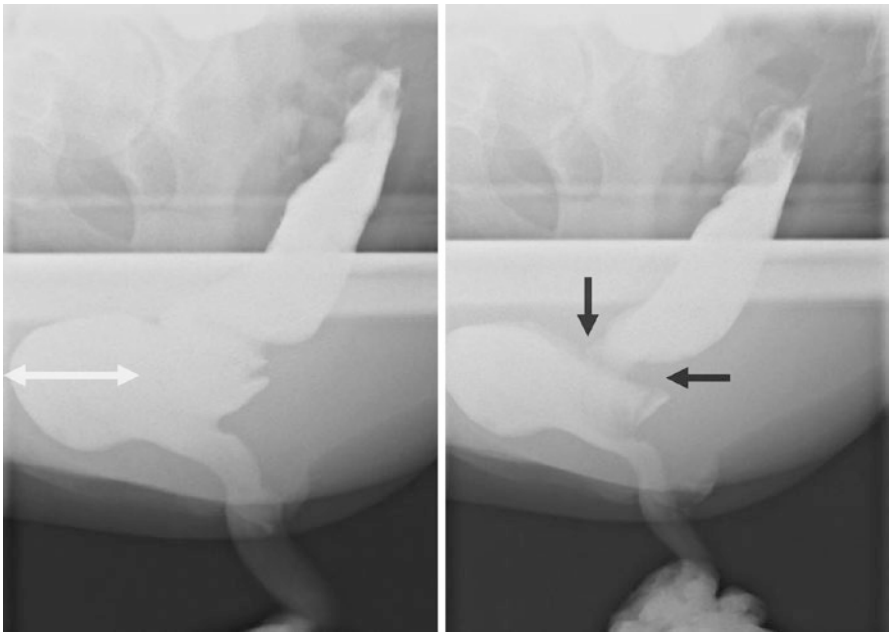

Fig. 4.13 Anterior rectocoele, with development of circumferential intussusception (*black arrow*) and barium trapping at the end of evacuation

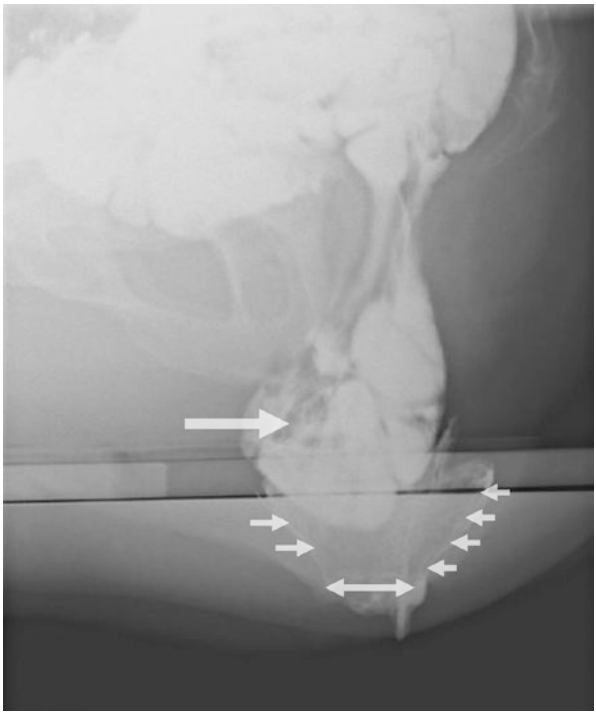

Fig. 4.14 Enterocoele associated with rectal intussusception

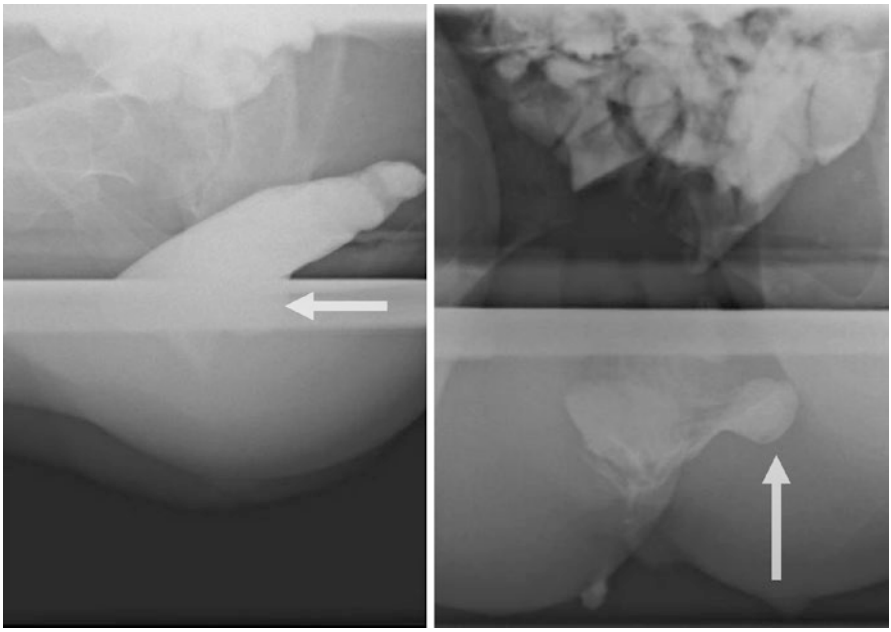

Fig. 4.15 Anterior rectocoele and lateral perineal hernia

Fig. 4.16 Posterior peri-anal abscess and fistula into the distal rectum demonstrated on sagittal T2 weighted imaging

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Part II

Causes and Assessment of Bowel Dysfunction

The Causes of Constipation

5

Brigitte Collins and Rebecca Knox

5.1 What Is Constipation?

Constipation is a symptom, not a disease and is the most common gastrointestinal complaint in the UK with 2.5 million sufferers in England (www.my-bowel.co.uk). Almost every one of us will be constipated at one time or another throughout our life [1].

Constipation can affect people of all ages. Most cases are not caused by a specific condition and are often multifactorial with several contributing factors including secretor and motor function of the gastrointestinal tract, central and peripheral gastrointestinal function, as well as environmental, genetic and comorbidity factors [2] thus making a definition and classification complex.

One of the common approaches for grouping constipation is to pertain to primary and secondary causes [3]. Primary grouping is inherent with problems of colonic or anorectal function, in other words functional disorders, either normal or slow transit constipation, irritable bowel syndrome where structural abnormalities may occur with or without a lack of defaecatory co-ordination [3, 4, 5]. Secondary grouping is often related to other conditions such as endocrine, neurologic, psychological and medications [3, 4, 6]. Therefore constipation differs from one person to another with varying bowel habits and symptoms, making any single definition a challenge to use in clinical practice [6, 7]. As a result treatment is not always straightforward and may need to take on a multimodal approach to effectively manage symptoms.

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Table 5.1 Rome III dignostic criteria for IBS-C and functional constipation

ROME III diagnostic criteria for irritable bowel syndrome with constipation and functional constipation (Rome foundation [8])
Recurrent abdominal pain or discomfort at least 3 days/month in the last 3 months associated with two or more of the following:
Improvement with defecation
Onset associated with a change in frequency of stool
Onset associated with a change in form (appearance) of stool
Hard or lumpy stools (Bristol Stool Scale 1 or 2) !25 and loose (mushy) or watery stools (Bristol Stool Scale 6 or 7) <25 % of bowel movements

Adapted from Longstreth et al. [9]

Table 5.2 IBS-C and functional constipation clinical criteria

Irritable bowel syndrome with predominant constipation (IBS-C) functional constipation
Criteria must be fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis
The presence of two or more of the following:
Straining during 25 % of defaecations
Lumpy or hard stools in 25 % of defaecations
Sensation of incomplete evacuation for 25 % of deafecations
Sensation of anorectal obstruction/blockage for 25 % of defaecations
Manual manoeuvres to facilitate 25 % of defaecations
Fewer than three defaecations per week
Loose stools rarely present without the use of laxatives
Insufficient criteria for IBS Criteria must be fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis

Adapted from Longstreth et al. [9]

However, to assist with classification the Rome III criteria define constipation as: straining, incomplete evacuation, lumpy stools, sensation of blockage and having to manually evacuate at least 25 % of all bowel motions and defaecating less than three a week [8] (Table 5.1 and 5.2).

For some constipation is temporary and easily preventable therefore health care professionals require an understanding of the causes which in turn may assist with treatment choices.

This part of the chapter will provide an overview of the primary and secondary causes associated with constipation:

5.2 Primary Constipation

5.2.1 Functional

5.2.1.1 Idiopathic Constipation/Normal Transit

Idiopathic/Normal transit constipation is where colonic motility is of a normal velocity and peristaltic contraction although high rectal perception and/or decreased rectal sensation is experienced [3] In turn difficulty in evacuation, hard

stools or abdominal discomfort may be encountered thus increasing psychological suffering [10].

5.2.1.2 Slow Transit Constipation

Slow transit constipation can impinge on any age group. The consensus is however, it generally affects younger women with symptoms beginning around puberty [11]. For many, slow transit constipation is idiopathic, however reports point out there may be some association following a phenomenon such as hysterectomy or childbirth as a result of impairment to the pelvic plexus [12, 13]. On the other hand slow transit constipation can arise from conditions such as Hirschsprungs disease discussed hereafter in the chapter.

Slow transit constipation may denote a decrease in colonic propulsive activity, a diminished gastrocolic reflex and/or delayed emptying of the proximal colon [1, 14]. This leads to irregular defaecation and it is not unusual for patients to report one bowel movement per week or weeks between bowel movements [10, 14]. This prolonged time of faeces in the colon can result in small hard stools that reduce the rectal pressure for activation of the anorectal reflex [4], thus presenting patients with problematic evacuation, bloating and severe abdominal discomfort.

A diagnostic test for slow transit constipation is the use of a colonic transit x-ray discussed in the radiology chapter.

5.2.1.3 Irritable Bowel Syndrome (IBS)

Approximately 5–11 % of the population in most countries are affected by irritable bowel syndrome with a female predominance and incidence at its greatest in the third and fourth decades (110). On the other hand prevalence of IBS varies considerably depending on diagnostic criteria used.

The Manning criteria [15] consist of a list of questions the physician can ask to produce a diagnostic decision as to whether the patient can be considered to have IBS and should contain at least two of the following:

- Onset of pain linked to more frequent bowel movements
- Looser stools associated with onset of pain
- Pain relieved by passage of stool
- Noticeable abdominal bloating
- Sensation of incomplete evacuation more than 25 % of the time
- Diarrhoea with mucus more than 25 % of the time

The idea of the Manning criteria [15] was to distinguish organic causes of symptoms from those of IBS.

The Rome III criteria required that patients have had recurrent abdominal pain or discomfort at least 3 days per month during the previous 3 months that is associated with 2 or more of the following: (Rome Foundation [8])

- Relieved by defaecation
- Onset associated with a change in stool frequency
- Onset associated with a change in stool form or appearance

Supporting symptoms include the following:

- Altered stool frequency
- Altered stool form
- Altered stool passage (straining and/or urgency)
- Mucus
- Abdominal bloating or subjective distension

The Manning criteria [15] was found to have less sensitivity but more specificity than the Rome criteria [16]

A survey for clinicians by Pimentel and colleagues in 2013 reported that 80 % of respondents found that the Rome 111 criteria did not reflect IBS sufficiently in their clinical practice and suggested that it was necessary for a new international standardised set of criteria.

So it would seem that in spite of these diagnostic criteria being used in clinical practice there is no one tool superior to the other and each one has its own advantages and disadvantages. Perhaps now is the time to expand and amalgamate these criteria for developing a gold standard diagnostic tool in the symptoms of IBS.

IBS is a common disorder characterised by abdominal pain, bloating and a varying bowel habit with a subtype of either constipation predominant, diarrhoea predominant or fluctuation between both constipation and diarrhoea in the absence of structural abnormalities [17, 18]. For many it is a relapsing problem where patients frequently present to their general practitioners and are repeatedly referred to gastroenterologists in secondary care [19]. Spiller and colleagues [18] support this concept suggesting that health care seeking behaviour is greater overall in the IBS population and not just in those with longstanding symptoms.

IBS is often associated with other comorbidities such as fibromyalgia, chronic pain and chronic fatigue syndrome with numerous other somatic complaints of anxiety, depression, adverse life events, neuroticism and reduced quality of life [20, 21].

It is often difficult to determine a likely cause to the symptoms of IBS with many experiencing a combination of causes for their symptoms. There are three key factors that may be responsible for the majority of IBS symptoms, as follows:

5.2.1.4 Disturbances of Gastrointestinal Motility

IBS tends to show an increased sensitivity of the gut although, motor disturbances between the IBS subtypes can vary [22]. It is delayed gastric emptying that consistently manifests in those presenting with constipation [23].

Eating a meal normally provokes a reflex stimulation of colonic motor activity which is known as the gastrocolic response [24]. Van dV et al. [21] demonstrated in their study using electrogastrography that there is a deficiency of reflex stimulation following a meal in those with IBS and thus is conceivably responsible for alteration in gastrointestinal motility. Although it is felt that emotions such as anger, fear, pain and anxiety suppress colonic contraction more in IBS than in healthy controls [25].

5.2.1.5 Visceral Hypersensitivity

Visceral hypersensitivity is thought to be a major pathophysiological characteristic involved in IBS patients and may play a key role in the development of symptoms of abdominal pain/discomfort [26, 27].

Visceral hypersensitivity can be measured using a balloon inserted in to the rectum and measuring the pressure [28]. According to studies IBS patients demonstrated an intensified sensitivity to this stimulation producing an increase in pain and discomfort at lower levels of rectal pressure when compared to healthy controls [29].

5.2.1.6 Postinfectious IBS

Acute gastroenteritis is commonly reported by IBS patients as the first trigger of their symptomatology [30].

Post infectious IBS is defined as the acute onset of new IBS symptoms in a patient who has not previously met the Rome criteria for IBS [31].

Nearly 10 % of patients with an intestinal bacterial infection account for their post infectious symptoms up to 10 years subsequent to the infectious episode [32]. Mounting evidence indicates slight adjustment in the immune system in both the gut and peripheral circulation of post infectious IBS patients [33].

Evidence has shown that a low grade inflammation and abnormalities of immune function may also have a responsibility in the pathogenesis of IBS [34].

There is now little doubt that post infectious IBS is one of the risk factors in developing IBS as highlighted by a survey of patients which showed that past gastroenteritis was 16.1 % in controls, 32.6 % in IBS non-consulters and 44.6 % in IBS patients [35].

5.2.2 Anorectal Function

5.2.2.1 Neoplasm/Bowel/Intestinal Obstruction

A bowel/intestinal obstruction is a mechanical or functional obstruction of the intestines that prevent a normal transit of digestion [36].

Obstruction of the colon either by a tumour or foreign body will produce an accumulation of faecal matter behind the obstruction. This will change the nature and frequency of the stools.

Signs and symptoms of intestinal obstruction may include any of the following:

- Swelling of the abdomen (distention)
- Abdominal pain or cramps that may come and go.
- Diarrhoea
- Constipation
- Nausea and vomiting
- Unable to have a bowel motion or pass wind.

5.2.2.2 Mechanical Obstruction of the Colon

Potential causes include:

- Colonic cancer
- Diverticulitis – a condition in which small, bulging pouches (diverticula) in the digestive tract become infected or inflamed
- Twisting of the colon (volvulus)
- Narrowing of the colon caused by inflammation and scarring (stricture) (Clinics in Colon and Rectal Surgery [37]).
- Paralytic ileus may cause symptoms of intestinal obstruction, although it doesn't involve a physical blockage. In paralytic ileus, muscle or nerve problems disturb the normal coordination of muscle contractions of the intestines, slowing or stopping the movement of food and fluid through the digestive system. Paralytic ileus can affect any part of the intestine and cause can include abdominal and pelvic surgery, infection, pain medications, antidepressants and also Parkinson's disease. (Paragraph from Mayo Clinic [38]).

There are several diseases and conditions [38] that can increase the risk of intestinal obstruction these include:

- Abdominal or pelvic surgery may result in adhesions, which are a common cause of intestinal obstruction [39].
- Crohn's disease can cause the walls of the intestine to thicken thus, narrowing the passageway [39].

When intestinal obstruction is left untreated it can cause serious complications, such as: a lack of bloody supply to the mucosa which in turn can cause the intestinal wall to die [3]. This may result in a perforation (tear) in the intestinal wall, which can lead to peritonitis [37]. Infection in the abdominal cavity is a life-threatening condition that requires immediate medical and often surgical attention [38].

5.2.2.3 Anismus

Anismus is often identified as dyssynergic defaecation, or paradoxical contraction. In normal defaecation the puborectalis relaxes and allows the angle between the rectum and anal canal to straighten [40]. In anismus there is an inability to co-ordinate the abdominal, rectoanal and pelvic floor muscles to assist defaecation [41]. As a result the puborectalis muscle and external sphincter contract rather than relax therefore the angle fails to straighten and as a result leads to ineffective or unsuccessful defaecation [42].

The diagnosis of anismus is based on clinical examination and proctography. Clinical examination involves digital rectal examination where there is a tightening of the muscles felt and very little movement of the finger [43]. Proctography can determine the features of anismus discussed in the Radiology chapter.

5.2.2.4 Rectocele

Rectocele is believed to be caused by weakness of the pelvic floor and rectovaginal septum [44].

An anterior rectocele is described as a protrusion of the rectal wall through the rectovaginal fascia, which is presented as a bulge in the posterior vaginal wall [45].

This condition occurs mostly as a result of childbirth particularly with problematic deliveries and multiple births. It also associated with chronic constipation, excessive straining, obesity, postmenopausal, hysterectomy, obstructed defaecation and incomplete rectal emptying [46].

Symptoms can include a vaginal feeling of heaviness, dyspareunia and for some bleeding caused by irritation [47]. Some may find that the rectocele may protrude through the vagina (see Fig. 5.1). In the rectum there may be symptoms of a need for straining to aid evacuation or as a result of the stool being trapped in the rectocele and often a generalised pelvic pressure can be felt [46].

5.2.2.5 Enterocele

An enterocele has been defined as the herniation of the peritoneum lined sac, usually the small bowel, through the pelvic floor, usually between the vagina [48] (see Fig. 5.2). There is a greater association between women who have had a

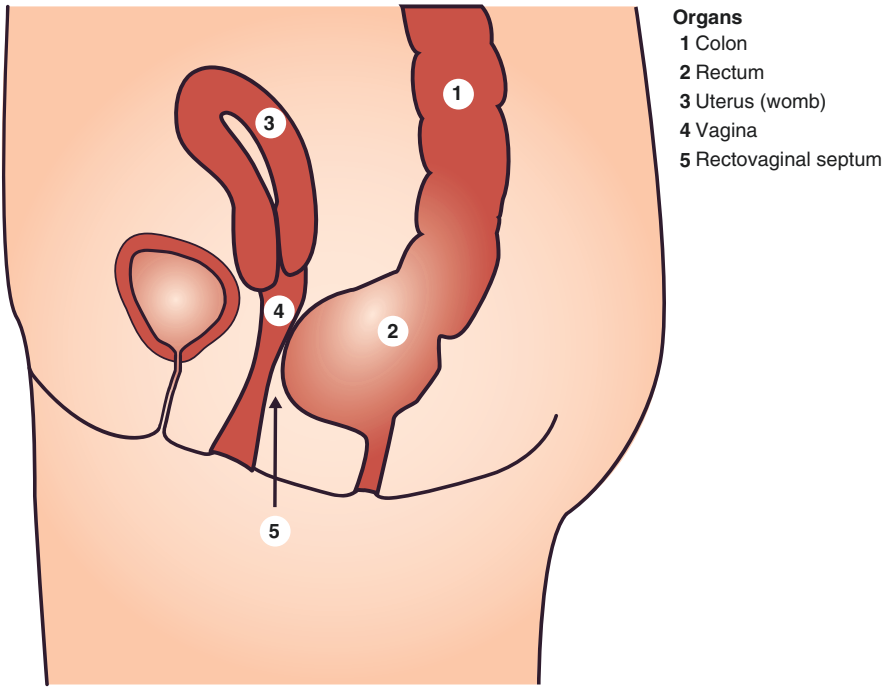

Fig. 5.1 Rectocele

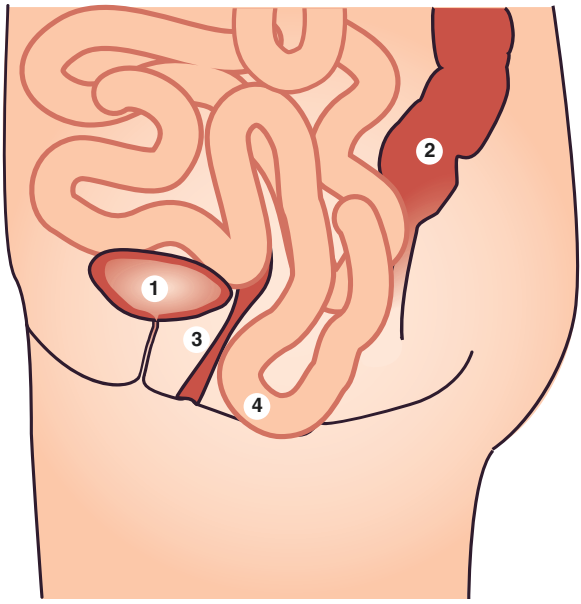

Fig. 5.2 Enterocele

hysterectomy and enterocele [49]. Patients usually present with pelvic pain or heaviness on standing, difficult and incomplete evacuation [49]. An enterocele is also best diagnosed on a defaecating proctogram.

5.2.2.6 Solitary Rectal Ulcer Syndrome (SRUS)

Solitary rectal ulcer is a chronic, benign disorder characterised by a single or multiple ulcerations of the rectal mucosa [50] (see Fig. 5.3). Excessive straining or abnormal defaecation caused by dyssynergia of pelvic floor muscles are a significant factor in the development of SRUS [51, 52].

Clinical features may comprise of rectal bleeding, mucus discharge, perineal and abdominal pain, feeling of incomplete defaecation, constipation and infrequently rectal prolapse [53]. Rectal digitation is repeatedly practiced because of evacuation complexity. This in turn can promote further trauma to the mucosa and additional ulceration [51].

Ulcers can vary in size ranging from 0.5 to 4 cm in diameter although it is usual to see a size of 1–1.5 cm [54]. Ulcers can be detected with a biopsy via a colonoscopy which may show preulcer hyperaemic alteration of the mucosa to determined white, grey or yellowish slough [55].

5.2.2.7 Rectal Prolapse

A rectal prolapse is the extensive protrusion of the rectum through the anal canal which can be associated with pregnancy, obesity, perineal injury and chronic constipation, often with symptoms of mucus discharge and rectal bleeding [56] (see Fig. 5.4).

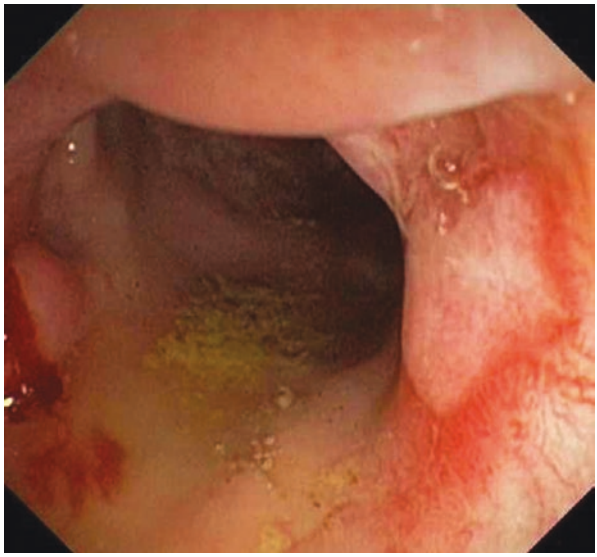

Fig. 5.3 Solitary rectal ulcer (need image from endoscopy awaiting bc) **need**

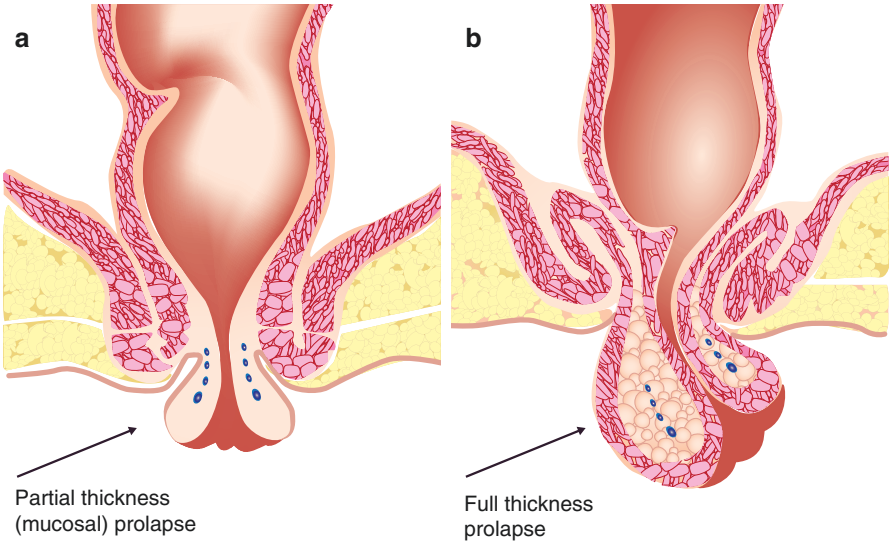

Fig. 5.4 Rectal prolapse

A rectal prolapse may occur spontaneously with coughing, sneezing, walking/standing or conversely it may well protrude following defaecation [57]. For some the prolapse may reduce spontaneously or require manual reduction. However, with time complications of strangulation can occur thus requiring a surgical approach if the prolapse is of full thickness [56].

5.2.2.8 Megacolon/Megarectum

Megacolon/Megarectum is characterized by an increased diameter of the rectum or colon and rectum due to a chronic process (see Fig. 5.5). This irregular diameter manifests as colonic distension and as a disorder of colonic motility, often with intractable constipation, abdominal pain, and bloating [58]. The abnormal dilatation can often be accompanied by paralysis of peristaltic movements.

Physical examination generally reveals a distended abdomen and digital rectal examination may demonstrate a hard mass of stool. In a megarectum there may also some gaping of the anus seen.

Megacolon can be diagnosed by imaging studies [59] (see Fig. 5.6). However, O'Dwyer et al. [58] believe the sensitivity of these measurements has never been formally tested and acknowledge the need for colonic motility testing to demonstrate the diminished colonic compliance and tone when imaging is ambivalent. On the other hand a water soluble contrast may assess the size of the colon.

5.2.2.9 Hirschsprungs

Hirschsprungs disease is commonly diagnosed in the newborn period or during early infancy although some reach adulthood before a diagnosis is established [60]. In neonatal the most common symptom is delayed passage of the meconium [61]. Classic symptoms of the neonate are abdominal distension and forceful passage of wind and meconium following digital rectal examination [62].

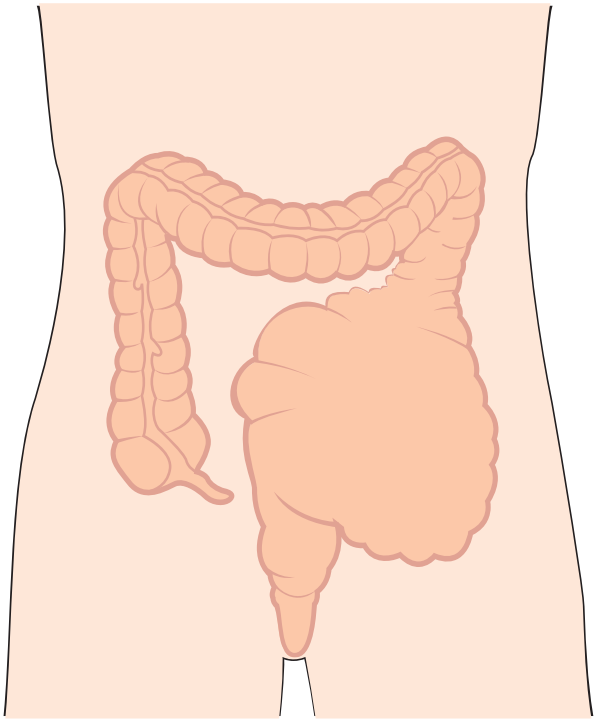

Fig. 5.5 Megacolon

Fig. 5.6 Megarectum

Hirschsprungs is characterised by the absence of ganglions in the distal colon thus causing the muscles to lose their ability of performing peristalsis resulting in functional obstruction [63].

In spite of Hirschsprungs being more commonly present in infancy or early childhood less severe forms can be evident in adulthood [64].

5.2.2.10 Faecal Loading/Impaction

Chronic constipation can lead to complications such as faecal loading and/or impaction [65]. Faecal impaction is defined as a large bulk of compressed faeces at any intestinal level that instinctively cannot be evacuated [66].

A systematic review [67] established that 43 % of 280 cases reported abdominal pain as being the most common symptom followed by constipation (18 %), nausea and vomiting 15 %) and abdominal distension (9 %). The review also acknowledged that other less common symptoms were those of diarrhoea, faecal incontinence and urinary symptoms. Location of faecal impaction was largely determined at the sigmoid colon (68 %) with 51 % detected in the rectum.

Retained faeces will be evident on abdominal or digital rectal examination [68]. Chronic faecal loading can cause other medical issues such as: faecal incontinence, rectal prolapse, rectal bleeding and urinary tract infections [69].

Faecal impaction is a highly prevalent gastrointestinal problem and a possible source of major morbidity [37]. Rapid identification and treatment is paramount to minimize the risks of complications [70]. Treatment options may include manual

evacuation and proximal or distal washout [68]. Following treatment, preventative measures should be initiated [71].

Regardless of a multimillion dollar laxative industry in our bowel-focused society, faecal impaction still remains an overlooked condition [72]. The occurrence of faecal impaction increases with age and can dramatically change the quality of life in the elderly [73].

One of the most important risk factors is insufficient dietary fibre and water intake [74]. An increase in fibre intake to 30 g/day together with adequate fluid intake helps prevent constipation and faecal impaction [75]. Lack of mobility due to ageing or spinal cord injury can also cause faecal impaction due to the reduction of peristalsis and an inability to use abdominal muscles required for defecation [76] Ironically, laxative abuse is associated with both faecal impaction & constipation, also patients who are laxative-dependent are not capable of producing a normal response to colonic distention and progressively requires higher doses to achieve a bowel movement [72].

5.2.2.11 Anal Fissure

An anal fissure is an oval, ulcer like, longitudinal tear in the anal canal, distal to the dentate line (see Fig. 5.7). Anal fissure is a common perianal condition, which is characterised by pain on defaecation and often for some hours following defaecation, anal bleeding, which is usually bright red blood on the toilet paper and anal spasm. A fissure typically occurs at the posterior midline with anterior midline position seen in 10–25 % of females and 1–8 % in males [77, 78]. Fissures can occur in all age groups, although it is more common in younger patients and accounts for 10 % of United Kingdom colorectal unit visits [79]. Acute fissures take on the appearance of a simple tear in the anoderm, whilst chronic fissures are usually described with symptoms lasting more than 8–12 weeks and non-healing [77]. A chronic fissure may also have associated skin tags.

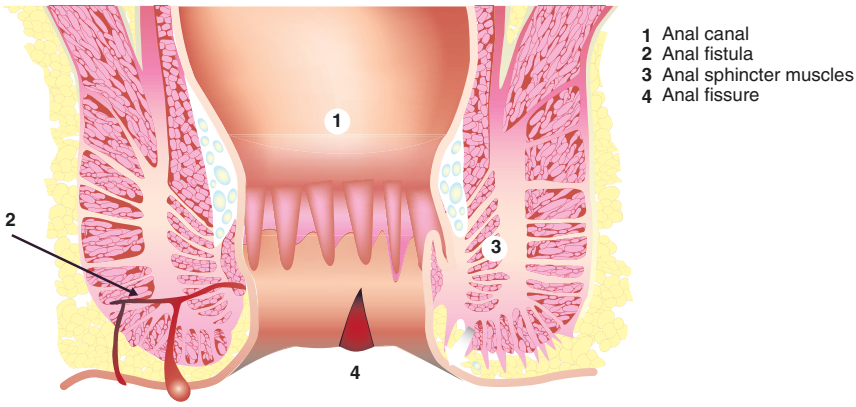

Fig. 5.7 The anus with anal fissure

5.2.2.12 Pelvic Floor Descent

Pelvic floor descent is usually seen during straining and is regarded as ballooning of the perineum by several centimetres below the bony outlet of the pelvis [39]. Pelvic floor descent is associated with pelvic floor weakness and associated with other anorectal disorders such as rectal prolapse, rectocele, solitary rectal ulcer syndrome and/or enterocele [80] (see Fig. 5.8).

5.2.3 Secondary

5.2.3.1 Medication

Medication associated constipation is not uncommon with a vast number of medications that may contribute to constipation which may include the following:

- Antacids
- Anticholinergics
- Anticonvulsants
- Antidepressants
- Antiemetics
- Antihypertensives
- Antiparkinsonian drugs
- Antipsychotics
- Calcium supplements
- Cytotoxic therapy

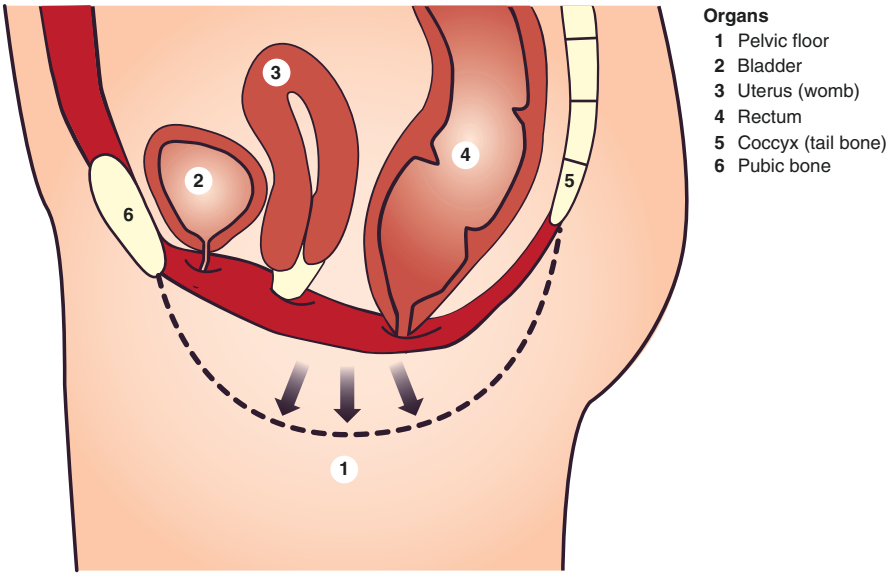

Fig. 5.8 Pelvic floor descent

- Diuretics
- Iron Supplements
- Laxatives (chronic usage)
- Opiates
- Non-opiate analgesia
- (Taken from [81])

5.2.4 Neurological

5.2.4.1 Cerebrovascular Accident (Stroke)

New onset constipation is seen in 55 % of patients within one month after a first stroke, strongly relating to disability [82]. The highest risk of constipation is often one week after a stroke, thus suggesting that this may be preventable with early intervention [83]. One of the risk factors associated with constipation in stroke is the type of drugs used such as antithrombotics, frusemide and nitrates, which may impede colonic activity and conceivably instigate constipation [82, 83].

Dysphagia is said to be seen between 37 % and 78 % of patients who have had a stroke thus resulting in restriction of dietary and fluid intake and therefore leading to dehydration and a significant risk of insufficient nutrition [84, 85]. Such risks and influences can surely only result in bowel dysfunction which is likely to support the possibility of developing constipation.

5.2.4.2 Multiple Sclerosis

Multiple sclerosis is a chronic neurological disease which is categorised by numerous demyelinating lesions within the central nervous system causing a variation of neurological symptoms inclusive of anorectal dysfunction [86]. It is thought that the central nervous system lesion related to the disease process may affect the neurological control of the gut and sphincter function [87].

Approximately 48.2 % of patients present with anorectal dysfunction with 18–43 % suffering with constipation [88]. However Gulick [87] suggest the prevalence of constipation in multiple sclerosis range between 35 % and 73 % and is highly dependent on the definition used.

5.2.4.3 Parkinsons

Parkinsons disease is concurrent with degeneration of dopaminergic neurons dysfunction and associated with motor and nonmotor disorders [89]. James Parkinson recognised gastrointestinal features in his original monograph published in 1817.

The nonmotor problems include autonomic disorders with the bowel being the most common in this category [90]. Unfortunately dopaminergic or anticholinergic drugs used for the motor disorder in Parkinsons have no influence on bowel function and can often increase colonic activity which in turn can lead to constipation [89]. Sakakibara et al. [89] relate this lack of bowel function improvement to there being no dopaminergic neurons contained in the pathology of bowel dysfunction and

suggests that other brain neurotransmitters are involved thus signifying that supplementary medications are likely to be necessary in treating the constipation.

Prevalence of lower gastrointestinal tract symptoms in Parkinsons disease is reported to be more than half and mostly in the elderly [91]. However, this can often prove difficult to determine because idiopathic constipation may occur in the elderly as a matter of course anyway [92].

5.2.4.4 Spinal Cord Injury/Cauda Equina/Neurogenic Bowel

After a spinal cord injury all aspects of the defaecatory process can be deficient with a neurogenic bowel being a major problem both physically and psychologically [93].

In spite of the extrinsic nervous system remaining intact after spinal cord injury there is a loss of normal sensory and/or motor control or both [94]. It is the lack of this central nervous control that leads to disordered dysfunction of the colon [95]. The configuration in the clinical presentation of the neurogenic bowel generally depends on the level and the degree of the lesion [93, 96].

There are two main types of neurogenic bowel upper motor neuron (UMN) when damage to the spine is above T12 and lower motor neuron (LMN) when lesions are below T12 [97]. The LMN or areflexic bowel results from a lesion affecting the parasympathetic cell bodies in the conus medullaris, the cauda equina or the pelvic nerve (REF). This leads to slow transit of the stool [98].

5.2.5 Psychological

5.2.5.1 Depression and Anxiety

Psychological components do not delineate constipation and are not necessary for the diagnosis; however feelings and beliefs are extremely capable of playing a part in gastrointestinal function. Depression and anxiety are psychological factors that patients with constipation can experience. This is discussed in more depth in the chapter for 'Psychological Medicine for Bowel Dysfunction.'

5.2.5.2 Eating Disorders

The two most clinically serious eating disorders are anorexia nervosa (AN) and bulimia nervosa (BN) [99]. Those with AN are terrified of being fat/overweight and endeavour to be thin by inhibiting food intake, self inducing vomiting, abusing laxatives and/or executing extreme physical exercise thus resulting in weight loss [99].

The prevalence rate in the population of AN is 0.3 % and generally transpires in young women [100], with mortality rates emerging as 5.1 % per decade [101].

BN patients are also concerned with being thin and engage in binge eating, purging, and exercise [102]. As with AN, BN tends to occur in adolescence and is prevalent in young women [102].

Gastrointestinal symptoms especially constipation are frequently seen in those with eating disorders. This is demonstrated by Salvioli et al. [103] study where they were able to show that from 48 patients with eating disorders, namely AN and BN,

90 % reported abdominal distension with more than half complaining of abdominal pain, gastric distension and nausea. AN patients in this study tended to complain of severe constipation and bowel obstruction, whilst BN experienced mostly bloating, flatulence which was followed by constipation, decreased appetite and nausea [104].

Constipation has been reported in 67–83 % of AN patients [105] and 62.8 % of BN patients [106]. On the basis of the Rome II or Rome III criteria, 11–24 % of patients with eating disorder are diagnosed with functional constipation [106].

5.2.6 Physiological

5.2.6.1 Pregnancy

Approximately 40 % of women will experience constipation at some point during their pregnancy, although the majority are affected in the early stages of pregnancy [107]. Constipation usually occurs as a result of physiologic and anatomical changes within the gastrointestinal tract [108]. One of the main reasons is the rise in progesterone and reduction in motilin which lead to an increase in transit time and therefore an increase in water absorption thus causing stool to become dry and hard [108, 109]. Later in pregnancy an enlarged uterus may slow onward movement of faeces [110].

5.2.6.2 Older Age

It is reported that constipation increases over the age of 65 with a prevalence of 50 % for those living in the community and 74 % in nursing homes [70, 73]. Constipation in the elderly is likely to be multifactorial with more than one mechanism present, such as co-morbidities, side effects of medications and/or opioid-induced constipation for the elderly with advanced cancer and pain [49].

5.2.7 Lifestyle

Lifestyle is one of the first aspects that is looked at when addressing constipation. In spite of this there is very little data to support this as being a definite cause and a lack of evidence to suggest that the following can improve constipation [111]. However, experts widely recommend lifestyle changes as a first line treatment [112].

5.2.8 Inadequate Fluid Intake

The general consensus is that the average healthy adult needs a daily fluid intake of 1.5–2 litres per day [81, 113] although amounts can vary between individuals [114]. Whilst increasing fluids suggests that stools may become softer and as a result be easier to pass there is no substantiated evidence that an increase in fluids in the absence of dehydration will make a difference [115].

5.2.8.1 Inadequate Dietary Fibre

Eating a healthy well balanced diet, including fibre, can improve the function of the bowel [6]. A Western diet is associated with reduced dietary fibre [116]. According to NHS Choices [75] the recommended daily intake of dietary fibre is 18 g per day, and yet the average in the UK is 14 g per day, thus suggesting that this decrease in fibre may play a part in constipation.

5.2.8.2 Lack of Exercise

There is evidence that increased exercise is linked with less constipation [117] and mild physical activity aids release of intestinal gas and decreases bloating [117]. A 12 week study of 56 IBS-C participants showed that exercise significantly improved constipation compared with standard care [118]. A randomised controlled over a period of 12 weeks with a supervised exercise programme of 20–60 min of moderate to vigorous activity 3–5 days per week significantly improved the symptom severity scores in a group of IBS participants [119]. Liu [120] points out that although the studies suggest that exercise may not improve stool frequency it is highly recommended for the part it plays in improving quality of life and other general health benefits.

Conclusion

Although this chapter is not an exhaustive section for the possible reasons behind constipation it does recognise and provide an overview of some of the main causes. Although, constipation as previously mentioned is often multifactorial and varies from person to person which therefore suggests that an individualised multimodal approach is requisite for the treatment of constipation.

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The Assessment of Constipation

6

Anna P. Swatton

6.1 Introduction

This chapter will aim to give the reader an understanding of the assessment process for patients with constipation. The assessment involves taking a patient's history in the same way as a medical assessment, but provides the clinician with the opportunity to fully assess the bowel problem. It is of course important to fully investigate any red flag symptoms to ensure that the constipation is not a symptom of undiagnosed underlying pathology; such as a cancer. The assessment presented here is unique in that it allows the clinician to explore the most problematic bowel symptoms for the individual, the bowel habit, stool consistency and any behaviours utilised or adaptations made to allow the individual to manage their symptoms. The assessment process encompasses a holistic approach to the pelvic floor ascertaining bladder and sexual functions in addition to anorectal symptoms. Furthermore pertinent issues, such as psychological morbidity, are also considered (see Fig. 6.1).

In addition to a structured approach to verbal assessment there is also a physical assessment. A digital rectal examination may be indicated and use of a balloon to test rectal sensation and expulsion (see Fig. 6.3). Using a comprehensive and structured assessment informs practice and facilitates the clinician in formulating the most individualised treatment plan for each patient.

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St Mark's Hospital: Constipation/Evacuation Disorder Biofeedback Assessment Sheet

Therapist: **Date:**

Patient Name

Hospital No: **Dob**

Address:

Telephone: Home: Work:

Referrer:

GP:

Marital Status: ☐ Single ☐ Married ☐ Lives with partner
☐ Separated ☐ Divorced ☐ Widowed

Occupation:

Ethnic Group: ☐ White ☐ Asian ☐ Black
☐ Chinese ☐ Other ……,,,……

Transit: ☐ Slow ☐ Normal ☐ Not done

Proctogram: ☐ Megarectum ☐ Rectocele ☐ Prolapse ☐ Const ☐ EvacDis

Start of problem:

Main problem now:

Patients goals/expectations of treatment:

Fig. 6.1 St. Marks hospital assessment of constipation and/or evacuatory dysfunction

Symptoms:

Urge: ☐ Yes ☐ No ☐ Sometimes ☐ Abdo ☐ Rectum

Frequency: _____ Longest bno: _____

Consistency: BSFS No: _____

Blood: ☐ Yes ☐ No ☐ Sometimes

☐ Bright ☐ Dark ☐ On wiping ☐ In stool ☐ In toilet

☐ Haemorrhoids ☐ Anal Fissure

Mucus: ☐ Yes ☐ No ☐ Sometimes

Digitate: ☐ Yes ☐ No ☐ Sometimes ☐ PR ☐ PV ☐ PSupp

Incomplete: ☐ Yes ☐ No ☐ Sometimes ☐ Abdo ☐ Rectum

Strain: ☐ Yes ☐ No ☐ Sometimes

Pain: ☐ Yes ☐ No ☐ Sometimes Having bo _____

Generally _____

Bloating: ☐ Yes ☐ No ☐ Sometimes

Laxatives: ☐ Yes ☐ No ☐ Sometimes

If "Yes", which? _____

Other meds: _____

PMH/Surgery: _____

Continence: Faecal: ☐ Passive ☐ Post defaecation ☐ Other: _____

Urinary: ☐ Stress ☐ Uragency ☐ Nocturia ☐ Other: _____

Sexual Function: ☐ Active: ☐ Dysparunia: ☐ Other: _____

Bowel pathology excluded: ☐ Yes ☐ No Type: _____

Diet: Regular? Examole (if relevant): _____

Fluids (including alcohol): _____

History Depression: _____

Effect on lifestyle/relationships/emotions:

_____

_____

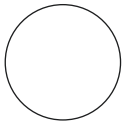
_____

On examination: Consent given PR/PV examination ☐ Yes ☐ No

Fig. 6.1 (continued)

Resting tone	**Squeeze**	**Evacuation**
Scars: Skin tage: Haemorrhoids:	Puborectalis: **0 1 2 3 4 5** Maximal squeeze: **0 1 2 3 4 5**	Paradoxical contraction:
Gaping: At rest With traction	Endurance (max squeeze): Repeats:	Ano-rectal co-ordination:
Resistance **0 1 2 3 4 5**	Sub-max endurance: Repeat x 2	Propulsive effort:
Marked perineal descent: At rest Straining	Fast contraction: (Up to 10)	Balloon expulsion:
Cough reflex: Absent/weak, delayed/good	Co-ordination: Response: Accessory Muscles:	**PV: / / // /// /** **Cystocele:** **Rectocele** **U/V prolapse:**

Trigger points:



Exercise taught: ☐ Brace pump ☐ Lift

Response: ☐ Well coordinated ☐ Fair coordination ☐ Poorly coordinated
Relaxation: ☐ Good ☐ Fair ☐ Poor
Breathing: ☐ Good ☐ Fair ☐ Poor
Propulsion: ☐ Good ☐ Fair ☐ Poor
Brace: ☐ Good ☐ Fair ☐ Poor

Other comments: _____

Fig. 6.1 (continued)

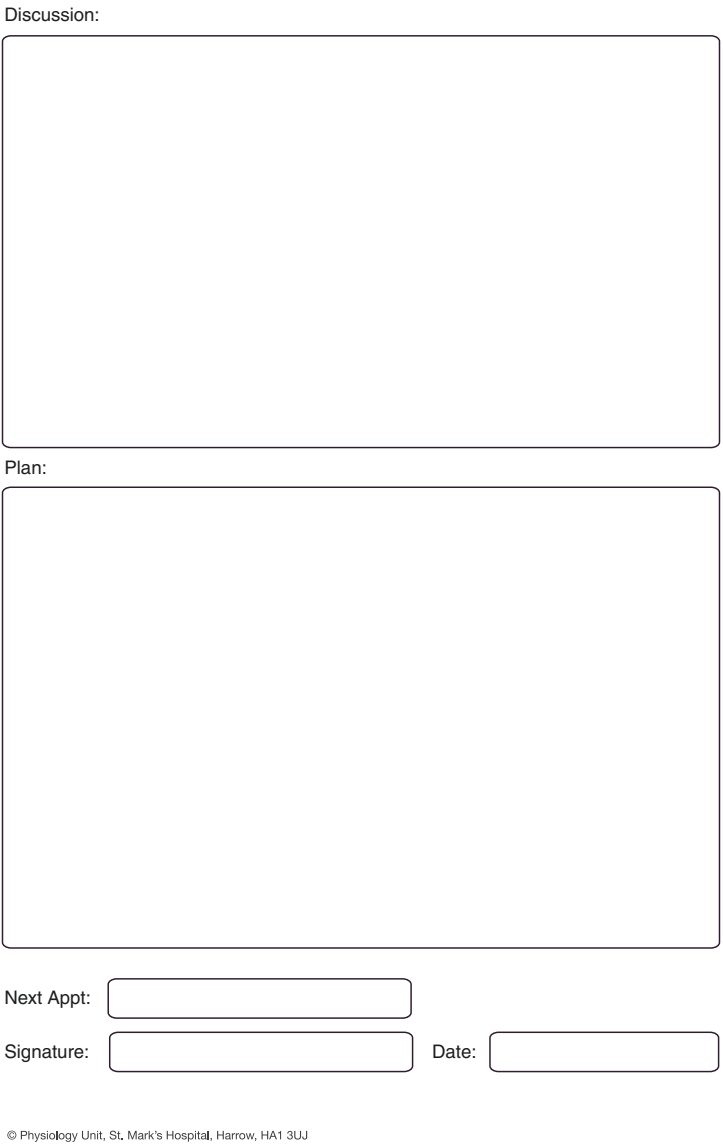


Fig. 6.1 (continued)

6.2 The Assessment Process

The assessment process is essential to enable treatment to be both planned and implemented effectively [8]. When meeting the patient for the first time in the nurse-led clinic it is essential to obtain a thorough clinical history of symptoms. This

process will take about 45–60 min. Developing a good rapport with the patient at an early stage will shape the future patient-nurse relationship (Williams and Davis [35]). Developing a therapeutic relationship at the outset will enable the patient to feel as comfortable as possible. Patients may then feel confident enough to reveal personal and sensitive information that may have an impact on their life. This process can be facilitated by having appropriate surroundings; such as a room in a quiet and uninterrupted environment. It is important to remind patients that their disclosed information will remain confidential, unless the nurse determines that further harm can come to the patient, or to others, though non-disclosure [21].

Accurate history taking from the patient and clinical examination are fundamental to assessing the most effective and appropriate treatment for the patient [32]. A good structure to the history taking is essential in understanding the patient's point of view regarding when the problem commenced and their particular concerns.

A system of questioning in a chronological order can help avoid confusion allowing the main symptoms to be established. It is necessary to discuss any interventions that have already been made and help identify if there are any missing investigations or any red flag symptoms that have not previously been identified [3]. The patient expectations should also be recognised and addressed. It is this early management of expectations which will ensure that goals are realistic and achievable [25].

The assessment can therefore establish what the main issues and further questioning may reveal precipitating factors, or if the problem has been lifelong. This can include issues such as previous surgery for example, at first glance not associated, but which on questioning may have involved a change of medications e.g. the use of opiate analgesia. There may be stresses or trauma in the patient's life such as a bereavement, divorce or family issues that may have been a precipitating factor. There may be changes in medical conditions which have contributed such as a diagnosis of an underactive thyroid.

It is vital to obtain the patients point of view as to what their actual problem is and how they are affected by their symptoms. What patients tell nurses may not be the same as stated to the doctors. This can be due to the doctor's unintentional misunderstanding of what the patient meant or patients underreporting symptoms that they may find embarrassing or difficult to discuss [2].

Despite careful questioning patients may not disclose important information to the nurse. This may be because they have never thought about it or they did not think that it was relevant. Some may find discussion of their bowels embarrassing or taboo. Non-disclosure may also occur in relation to issues such as abuse which can be physical, sexual or psychological which can lead to post-traumatic stress. These stressors can all manifest themselves in various ways, including functional abdominal complaint, somatization and in some people, constipation [3].

6.3 Constipation

Constipation can be defined using the Rome IV [27] Criteria (see Table 6.1).

Constipation can be subjective and a comprehensive assessment is necessary to rule out any underlying disease [3]. It is important to clarify with the patient what

Table 6.1 Rome criteria [27]

Constipation should include two or more of the following symptoms for at least 3 months:
Straining during at least 25 % of defecations
Lumpy or hard stools in at least 25 % of defecations
Sensation of incomplete evacuation for at least 25 % of defecations
Sensation of anorectal obstruction/blockage for at least 25 % of defecations
Manual manoeuvres to facilitate at least 25 % of defecations
Fewer than three defecations per week

they understand by the term "constipation". Some patients feel that if they do not have their bowels open every day they are constipated [36].

The Royal College of Nursing in their document entitled 'Management of lower bowel dysfunction, including DRE and DRF' states that normal bowel activity can be daily, three times a day or three times a week [24]. It is therefore important to ask the patient what has been normal for them [7].

Anecdotally, other symptoms associated with constipation include headaches, fatigue, loss of appetite and nausea. These symptoms can resolve once the underlying cause is addressed [1].

6.4 Undertaking an Assessment

Questioning the patient can be started by a general statement such as 'were there any specific triggers for your problem?' Open ended questioning is one of the most effective methods of both extrapolating knowledge and understanding how the symptoms affect the individual [35]. It is helpful to establish when the constipation started; whether it was gradual or sudden and over how long it has occurred, whether it is a long standing problem and why the patient has sought treatment now. During the history taking phase it is necessary to determine if symptoms are constant or intermittent; and if intermittent how long they last for. These issues should be explored further by determining any situations that make their symptoms better or worse. If pain is a main symptom the nurse should determine the location and frequency of the pain experienced and what, if anything, alleviates this. The type of pain should be explored using terms that the patient feels comfortable with, such as dull, aching and burning; does the pain move or radiate and how long it persists. A pain score can be utilised to determine the severity of the pain [15]. Other symptoms can exist with the pain and these also need to be explored. For example it is important to know what the precipitating and palliating factors of pain are. Some patients may note that pain is relieved on defaecation; this is common in patients with irritable bowel syndrome (IBS) that are predominantly affected by constipation [11].

6.5 Assessing the Medical History

During the nursing assessment all medical conditions should be considered [10]. The onset of any medical problem needs to be assessed including when the patient was diagnosed, how the patient was diagnosed and any treatment to date. Some medical conditions that can affect the bowel function include diabetes, Parkinson's disease, Alzheimer, chronic pain, fibromyalgia, Hirschsprungs disease, chronic fatigue syndrome, hypothyroidism, spinal injuries, stroke, irritable bowel syndrome and inflammatory bowel disease (IBD) for example [6]. Thus if there is a new disease diagnosis and medication is commenced this may affect the bowel function and result in constipation. It is important to remember that chronic conditions including musculoskeletal disease, such as rheumatoid arthritis can affect mobility and bowel function for a variety of concomitant reasons such as reduced mobility or increased analgesia intake [33].

6.6 Assessing the Surgical History

Surgery can affect the bowels and thus a surgical history must be included in the patient assessment [8]. When assessing patients surgical history it is essential to establish the type of operation, rationale for the surgery and when this was performed; plus any surgical complications that may have occurred.

Of particular note in relation to bowel assessment has the patient had any previous bowel surgery such as a colectomy, stoma formation or a stoma [31]. Other surgery that may affect the patient's bowel function includes spinal, gynaecological, obstetric or abdominal surgery; and pelvic floor reconstruction or repair [2], which may lead to adhesions. If the patient has previously had a cancer and received chemotherapy or radiotherapy particularly of the bowel or pelvis, this treatment may affect gut function and needs to be recognised. Chemotherapy can cause loss of probiotic bacteria and radiotherapy can cause fibrosis of the pelvic floor tissues. Both of these can affect both bowel motility and evacuation [9].

6.7 Assessing Drug History

Assessing current and previous medications should include prescribed medications, non-prescribed medications, illicit drugs and herbal remedies. All drugs have side effects, many gastrointestinal and some may cause of constipation. Some commonly used drugs that may be associated with constipation include diabetic drugs, antacids, anticonvulsants, parkinsonian drugs, iron supplements, opiates, antipsychotics and laxatives [8]. Some medications have fewer side effects and patients may find that these are more appropriate for them in addressing issues such as constipation.

6.8 Assessing Laxative Usage

Self- medication, with over the counter laxatives is common in people with constipation [8]. Laxatives commonly used include Senna, Dulcolax, Fybogel and Lactulose. Despite patients self-medicating, the cost of prescribing laxatives is a huge part of the general practitioners (GPs) budget and laxatives may be prescribed without fully assessing patients underlying exacerbating factors [19, 26]. When assessing a patient it is important to establish what laxative regime is utilised by them; including the frequency and amount of laxatives used. The results of using laxatives can be unpredictable and these drugs tend to lose their efficacy over time [23]. Any misuse of laxatives needs to be established including determine if laxative abuse is being used, for example in undiagnosed eating disorders (Swatton reference and in ref. list). Of course laxatives have a place in treating constipation if used appropriately; under medical guidance. As the effect of laxatives may alter over time there may be a combination of medications used by the patient include prescribed and non-prescribed drugs.

6.9 Assessing General and Red Flag Symptoms

General symptoms of constipation can be explored to include issues such as changes in weight, appetite, diet, exercise, psychological wellbeing and any adverse life events such as abuse and bereavement (Roger [26]). Associated symptoms that may need to be explored are indigestion, nausea, vomiting, rectal bleeding, pain on defecation, bowel dysfunction, faecal incontinence and incomplete evacuation. Any red flag symptoms such as rectal bleeding, change in bowel habit, new abdominal pain, unexplained weight loss, loss of appetite or abdominal masses are further explored to exclude an underlying pathology [17].

Red flag symptoms may require further investigations, which may be in the form of flexible sigmoidoscopy or a full colonoscopy to examine the lining of the bowel for inflammatory bowel disease, polyps or a bowel cancer. These investigations are usually performed prior to attending the nurse led biofeedback clinic but patients may not have previously reported these symptoms to their GP and may emerge during the assessment [17]. Any new symptoms need to be discussed by the nurse with the MDT (multidisciplinary team) or overseeing Consultant, or GP as soon as possible.

6.10 Assessing Global Pelvic Floor Function

In conjunction with bowel issues there may be urinary dysfunction that also requires assessment. This includes urinary frequency, haematuria, urinary incontinence or cystitis [18] When assessing a patient's neurological symptoms this includes multiple sclerosis, spinal cord injuries and Parkinson's disease. The pelvic floor should

be considered as a whole during assessment and urinary symptoms are relevant. Anecdotally voiding difficulties from the bladder may also relate to rectal emptying due to the interplay between the pelvic nerves [18]. Sexual function is also important as this may relate to pelvic floor dysfunction or may be the result of the psychological impact of having a bowel dysfunction [2].

6.11 Social Assessment

In addition to family history of any bowel problems or concomitant conditions, assessment should include discussion on relevant social factors on relevant social factors. A social assessment including occupation, living conditions, relationship status, any dependants or any social services involvement [32]. Understanding a patient's situation shows respect for individuality in acknowledging the factors that may impact on bowel function [5]. Pertinent factors to consider are recent travel, alcohol intake, any recreational substance usage and smoking history. Understanding the patients social situation may lead to an in-depth understanding of the precipitating factors that led to symptoms [35].

6.12 Assessing the Main Bowel Symptoms

Having established the history of the bowel problem, it is important to ascertain which issues are the most bothersome to the patient [5]. This enables the clinician to promote a highly individualised treatment plan. If symptoms can be prioritised in this way then a goal centred approach can focus the assessment on what the patient, not the clinician, deems most important [37]. This is the cornerstone of patient centred care [36].

It is important to establish when this problem first occurred and exacerbating and palliating factors. Once this is established this may provide the nurse with indications as to the cause of the bowel dysfunction that the patient may not have previously made an association with. This can include psychologically traumatic life events such as divorce, bereavement or hormonal shifts such as the onset of the menopause [5].

6.13 Assessing Bowel Habit

When considering bowel habit, the clinician should consider the patients pre morbid bowel habit. This gives an indication of what may be achievable in terms of successful treatment. For example, if from childhood a person has not had a daily bowel action, it is unrealistic to expect that this can be achieved in adulthood.

A "normal" bowel pattern can range from three times per week to three times a day [5].

This part of the assessment will include asking questions explicitly on how the bowel functions; such as urge, frequency, consistency, blood, mucus, digitation, incomplete evacuation, straining, pain, bloating and use of laxatives.

In relation to 'urge' this question is used to determine the patient's perception of their bowel function. Normally an urge to defecate will be experienced and a successful defecation occurs. However in some patients historically the urge was deferred. Deferral of defecation can be for a variety of reasons such as the patient was too busy and has no time to defecate, they only like to have a bowel action at home or they like to be alone for the defecation process. Consistently ignoring the urge to defecate can result in constipation, the passage of hard stools and potentially the loss of sensation of urge (Chelanayagam and Norton [5]).

It is important to elicit from the patient if a bowel action is spontaneous or following laxative usage. It should be noted that patients may not admit to opening their bowels for 2 weeks or more, but on further questioning it may be established that they are passing one or two pellets of faeces every few days but they do not feel that this is satisfactory bowel action and thus dismiss it.

6.14 Assessing Stool Consistency

It is essential to assess the consistency of the stool for softness or hardness as this can be an indication of a slow bowel transit or give information as to the individual's response to laxatives. The longer the faeces are in the colon the more fluid is reabsorbed and thus the stool will be harder and drier [1]. A stool consistency score such as the Bristol Stool Chart (see Fig. 6.2) can be used to assist the patient to grade their stool consistency. The Bristol Stool Chart can give a recognised visual aid for the patient to relate to and can reduce the embarrassment for the patient if they are finding it difficult to describe the stool consistency.

6.15 Assessing Rectal Bleeding

There may be a variety of reasons that the patient will pass blood from their rectum. Thus it is essential to establish how often blood is passed and ensure that any underlying pathology has not been missed. Provided that appropriate investigations have been undertaken to exclude inflammatory bowel disease or cancer, bright red blood tends to be associated with benign conditions such as haemorrhoids, an anal fissure or a solitary rectal ulcer (Henderson and Cash [14]). All these problems would result in bright red blood on the surface of the stool or on the tissue when wiping or in the toilet. Haemorrhoids are more commonly termed piles and can be described as dilated anal cushions [3]; haemorrhoids are incredibly painful and often bleed during the defecation process. An anal fissure is a small tear in the skin around the anus either inside or outside and can cause pain and bleeding on defecation. Both haemorrhoids and anal fissures can result in the patient deferring the urge to defecate due to the associated pain. A solitary rectal ulcer can be associated with intussusception, rectal prolapse and digitation [30]. Intussusception can be described as a concertina of the rectal mucosal lining, whereas a rectal prolapse can at its worst be a fill thickness prolapse of the rectum through the anal canal (Henderson and Cash [14]).

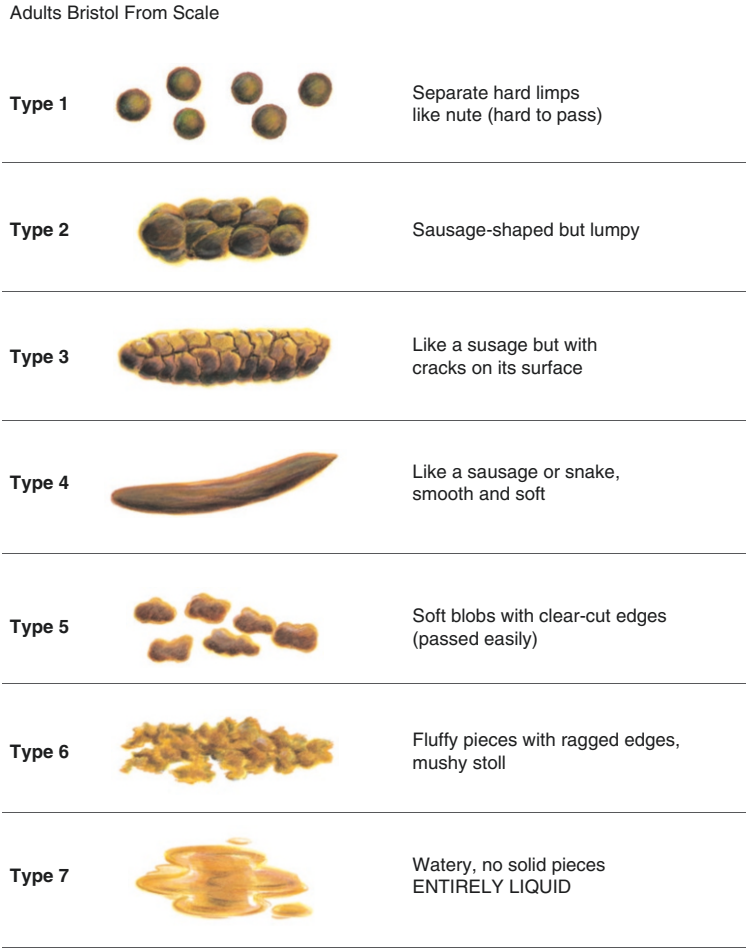


Fig. 6.2 Bristol stool chart

In extreme situations the haemorrhoids or rectal ulcers can bleed significantly resulting in visible fresh blood in the toilet bowl. Dark blood is associated with bleeding for further up within the colon and is more likely to indicate something serious such as a bowel cancer and will require further investigation; if this has not already occurred [3]. The passage of mucus is also associated with intussusception and rectal prolapse [36]. Mucus can be passed during defecation or on its own. Some mucus is normal due to the presence of mucus secreting glands which lubricate stool but an increase in mucus or passive loss of mucus may signify a mucosal prolapse (Henderson and Cash, [14]).

6.16 Assessing Digitation

Digitation is the insertion of a finger into the rectum or vagina in order to assist evacuation or to ensure rectal emptying (Chatoor and Emmanuel [4]). It is not uncommon for patients to digitate their rectum or vagina during the evacuation process and this needs to be ascertained during the nursing assessment. Questions like "do you ever need to do anything else to help you empty during a bowel movement" or "is there anything else that you do during an evacuation to help you empty your bowels", are open question and allow the patient to disclose what they actually have to do to evacuate. It should be remembered that this may be very difficult for the patient to discuss as they may never have previously admitted this to anyone; thus sensitivity is paramount.

6.17 Assessing Incomplete Evacuation

Some patients may feel that the evacuation is unsatisfactory [8] and have a sensation that there is still stool left in the rectum; although there may or may not actually be any retained stool. This is termed "incomplete evacuation" [8]. This sensation may be the result of abdominal distention or a rectal sensation rather than the result of a poor evacuation, but can lead to patients excessively straining, spending long periods of time on the toilet and/or returning to the toilet several times in order to try and complete their evacuation [4].

If the sensation of incomplete evacuation is abdominal it may be associated with a history of abdominal bloating; this will be discussed later. The sensation of incomplete evacuation that is felt in the rectum can be as a result of a solitary rectal ulcer, intussusception or a partial rectal prolapse into the anal canal. In some women this can also be due to a rectocele. A rectocele is a weakness of the anterior rectal wall; the wall that separates the rectum from the vagina. The anterior rectal wall bulges and forms a 'pocket' towards the vagina, when there is a rectocele [2]. Women with rectoceles will often report a sensation of incomplete evacuation which can be due to the 'pocket' causing a false sensation or a small amount of stool being trapped within the pocket. Some women will report that they digitate vaginally or use pressure on the perineum to aid complete evacuation of this 'pocket' of stool.

Anecdotally the most common reason that women report an incomplete evacuation is in relation to a rectocele. In men an incomplete evacuation may be due to a posterior rectocele or herniation of the rectum; which can be related to excessive straining over a long period of time [4]. In both cases a rectocele can be determined by a defecating proctogram; as explained in a previous chapter.

6.18 Assessing Straining

Straining on the toilet is often associated with constipation and can be frequently related to the cause of haemorrhoids, rectal prolapse, intussusception and rectoceles [33]. Patients tend to believe that straining is necessary to achieve a bowel evacuation and are unaware of the consequences of excessive and prolonged straining; as

previously described. Appropriate use of intra-abdominal pressure can be taught to achieve complete evacuation in the absence of straining. To effectively empty the bowel requires a brace technique (Norton and Chelvanayagam [5]). This is an exercise, performed on the toilet, whereby the patient uses appropriate increase of intra abdominal pressure by widening at waist level, keeping the abdomen "braced" or pushed out and bearing down for a few seconds (Norton and Chelvanayagam [5]). This will be discussed in more detail in the chapter on conservative treatment options.

6.19 Assessing Pain

Assessment of pain is vital; including site of pain or its association with pre- and post-defecation. General abdominal pain perceived prior to defecation may simply be a result of abdominal bloating; whereas left sided abdominal pain can be related to a full rectum, possibly with faeces extending up to the sigmoid and/or descending colon. Anal pain that occurs during and after defecation can be related to haemorrhoids and anal fissures. After a haemorrhoidectomy defaecation is painful and it is not uncommon for patients to defer defecation and when they do open their bowels their pelvic floor muscles are tense and go into spasm at the anticipated pain. This can lead to a tightness in the puborectalis; a muscle that is part of the pelvic floor; can also be termed pelvic floor hypertonicity or dyssynergia [33].

Pain may also be related to symptoms of IBS (Irritable Bowel Syndrome) or IBD (Inflammatory Bowel Disease) (Travis et al. [34]). IBS is a combination of symptoms that include stomach cramps, abdominal pain, bloating, constipation and/or diarrhoea. IBD is a disease such as Crohn's disease or ulcerative colitis that affects the bowel and can be associated with bleeding, abdominal pain, constipation and/or diarrhoea that frequently requires drug or surgical intervention.

6.20 Assessing Bloating

Bloating is commonly reported by people with constipation; particularly in association with IBS. The symptoms are non-specific and can be related to excessive dietary fibre or undiagnosed coeliac disease; the latter is intolerance to wheat. Bloating can also be associated with stress, anxiety or unreleased flatulence [28]. It is important to note which, if any, treatments have been tried for bloating, whether this be dietary exclusion, modification or use of supplements or probiotics [16]. In some cases the cause of bloating cannot be identified but has a negative impact for many people in terms of discomfort, reduced appetite and body image [29].

6.21 Assessing Continence

Continence needs to be addressed, not only faecal incontinence but also any bladder symptoms. The nurse should ask about any passive incontinence or post defecation soiling which may be an indication of faecal impaction leading to

faecal overflow [5, 6]. Because of the link in bladder and bowel function due to neural pathways it is important to assess global pelvic floor function. Both the pelvic floor and faecal incontinence are discussed more fully in separate chapters.

6.22 Assessing Obstetric History

Assessment of an obstetric history can have an influence on bowel function. Constipation is a recognised symptom during pregnancy which can continue following delivery. Constipation during pregnancy is related to hormone changes and the pressure of the growing foetus on the gut. Following pregnancy, constipation can be due to different dietary habits, an altered routine and/or lifestyle [13]. Constipation can also be the result of episiotomies, haemorrhoids and difficult deliveries that require instrumental assistance such as the use of forceps, that may result in pelvic floor dysfunction that does not manifest itself until later in life; such as during or after the menopause.

6.23 Psychological Assessment

Within the assessment of the patient with constipation it is essential to include psychological evaluation and any history of depression or anxiety. The therapist should acknowledge the impact that a psychological disorder can have on the gut function; with the subsequent impact on daily life. Other factors such as physical and sexual abuse or major losses like bereavement can affect a persons' psychosocial development which in turn is associated with poor coping mechanisms. This can manifest as abnormal motility such as slow gut transit, altered mucosal immunity and visceral hypersensitivity. This can be due to a disruption of the immune system, an alternation of the gut brain axis which can lead to the viscera becoming more sensitive. The effects of psychological issues vary between individuals; for some patients there may be a greater degree of exacerbation of their gut symptoms than for other patients [11]. The relationship between the gut-and the brain (often referred to as the gut brain axis) will be explored in a separate chapter, but can be seen when the bowel function is affected by anxiety.

6.24 Assessing Diet

Diet can have a huge impact on gut function. The therapist should establish from the patient if they have a regular diet, the food types taken, fluid intake and any food allergies or intolerances. Lack of regular diet can adversely affect the gut peristalsis, causing or exacerbating any existing symptoms of constipation. In patients with slow transit constipation excessive amounts of insoluble fibre may cause exacerbation of constipation and symptoms such as bloating and hard stool. Very specific

Table 6.2 Inspection of the perianal area

Anal closure
Rectal prolapse
Sore skin
Skin tags
Anal fissures
Haemorrhoids
Blood
Any other abnormalities such as warts

dietmodifications or exclusion diets must be managed by a specialist dietician. While assessing diet a BMI should be taken. Some patients can present with constipation as a side effect of an atypical eating disorder [30].

6.25 Physical Assessment

As part of the patient assessment a physical examination is indicated [10]. Assessment includes a digital rectal examination which will be discussed.

Physical examination is an essential part of patient assessment and establishment of any allergies including latex allergies is required. Digital rectal examination (DRE) is an intimate procedure and patient consent is paramount [20]. Examination includes a visual examination of the perianal area.

Anal closure is related to whether the anus is actually closed or gaping open. Gaping open can be indication of weak sphincter muscles or sphincter damage. Skin tags are small pieces of soft, hanging skin (see Table 6.2).

6.26 Digital Rectal Examination (DRE)

Prior to digital rectal examination, full explanation of what is about to occur is given to the patient and consent gained. DRE is undertaken using the standard universal precautions of gloves [24] to assess a number of factors (see Box 3). DRE is performed with the patient in the left lateral position with the patient bringing their knees up to their chest. After visual assessment, lubrication is applied to a gloved index finger; this is gently inserted into the patient's anus and rectum. The finger sweeps around the circumference of the anus; feeling for any abnormalities including lumps and bumps or any specific areas of pain. The use of an anorectal assessment tool can guide the examination; such as the one described by [12] (see Fig. 6.3).

Anal tone is the strength of the anal sphincter muscle and its ability to squeeze shut and hold in flatus or bowel contents. Anal sphincter defects are damage to the anal sphincter muscles that can result in a poor anal tone. Sphincter damage may occur as a result of obstetric injury, trauma or surgery such as a haemorrhoidectomy. Subsequently a further examination includes assessment of the patient's evacuation technique through the use of balloon expulsion.

Ano-rectal assessment tool

Resting tone	Squeeze	Evacuation
Scars: Skin tage: Haemorrhoids:	Puborectalis: **0 1 2 3 4 5** Maximal squeeze: **0 1 2 3 4 5**	Paradoxical contraction:
Gaping: At rest With traction	Endurance (max squeeze): Repeats:	Ano-rectal co-ordination:
Resistance **0 1 2 3 4 5**	Sub-max endurance: Repeat x 2	Propulsive effort:
Marked perineal descent: At rest Straining	Fast contraction: (Up to 10)	Balloon expulsion:
Cough reflex: Absent/weak, delayed/good	Co-ordination: Response: Accessory Muscles:	**PV: / / // /// /** **Cystocele:** **Rectocele** **U/V prolapse:**

Resistance
0 = open at rest
1 = no resistance
2 = poor
3 = fair
4 = good
5 = unable to insert finger

Max squeeze
0 = nothing
1 = flicker
2 = weak/partial
3 = moderate + slight lift
4 = good + lift
5 = able to squeeze and lift against resistance

Puborectalis
0 = nothing
1 = flicker
2 = weak/partial
3 = moderate + slight lift
4 = good + lift
5 = able to squeeze and lift against resistance

Examiner:

Date:

Fig. 6.3 Anorectal tool (Evans [12])

6.27 Balloon Expulsion

A balloon expulsion test is used to assess the patient's ability to expel a simulated stool. It is a useful method of assessing defaecation disorder and pelvic floor dyssynergia. It can also demonstrate if there is paradoxical contraction or anismus,

inappropriate muscular contraction or tightening of the anal sphincter. Balloon expulsion can be used to teach patient an effective evacuation technique (Norton [3]). Verbal consent must be obtained and as previously mentioned exclusion of a potential latex allergy. The patient lies down in the left lateral position with the knees flexed towards the chest. A DRE examination should be performed prior to the balloon testing. The empty balloon is lubricated and inserted into the rectum. The balloon is then filled with 50mls of air and the patient is asked to inform the nurse who is performing the assessment and procedure, when they feel an urge to defaecate. The volume of air can be an indication of the rectal volumes that give the urge and threshold perception to the individual. The patient is asked to expel the balloon and assessment can be made of their evacuation technique, pelvic floor descent or if any prolapse occurs (Fig. 6.4). Balloon expulsion can also be used to teach urge resistance for incontinent patients; this will be discussed in the chapter on assessing faecal incontinence.

6.28 Quality of Life

Quality of life can be immensely adversely affected by constipation; causing physical and psychological distress [22]. Not only is the quality of life of people suffering from constipation affected but there are also socio-economic factors related to an inability to function in areas such as employment. When assessing patients the use of a recognised assessment tool is required in order to assess symptoms pre and post treatment. Nomura et al. [22] consider that the PAC-QOL is the best tool available for assessing patient's constipation symptoms and this is also used in the authors practice. PAC-QOL considers many of the factors already discussed above and provides a holistic assessment of the patient's symptoms and the effect constipation has on their life. From unpublished data in the authors department more than 80 % of patients reported improvements in the PAC-QOL score after treatment for constipation. Thus a full assessment is essential to gain such dramatic improvements in symptoms.

6.29 Follow Up

The assessment can be repeated at follow up appointments 4 weeks after the initial consultation. Depending on the patients reported main problems progress can be monitored by repeating a shorter symptom specific assessment (see Fig. 6.4).

6.30 Summary

Constipation will be experienced by most people at some point in their lives. Constipation may be short lived (acute) or more prolonged (chronic) and can affect quality of life. The concept of constipation is subjective and bowel habits vary for

St Mark's Hospital: Constipation/Evacuation Disorder Biofeedback Review Sheet

Session No: **Date:**

Patient Name & Hosp No:

Progress:

Routine:	Daily/Other	10mins/Other
Symptoms:		
Faecal:		
Urge:	Yes/No/Sometimes	
Frequency:		
Consistency:	BSFS	
Blood:	Yes/No if "yes", details:	
Mucus:	Yes/No	
Digitate:	Yes/No/Sometimes	PV/PR
Incomplete:	Yes/No/Other	
Strain:	Yes/No/Other	
Pain:	Yes/No/Sometimes	Having bo Generally
Bloating:	Yes/No/Sometimes	
Continence:	passive post defaecation	Other:
Urinary:	Stress incontinence:	
	Urgency incontinence:	
	Nocturia:	
	Other:	
Laxatives:	Yes/No	
Other Medication:		
On examination:	**Consent given for PR/PV examination:** Yes/No	

Fig. 6.4 St. Marks assessment review sheet

different individuals. Common associated symptoms along with constipation are headaches, fatigue, nausea, vomiting, bloating and abdominal pain [1].

It is essential to undertake a thorough assessment in order to be able to plan an effective treatment plan for the patient. There are various methods that can be used to undertake the assessment process such as through the use of dialogue and asking relevant open ended questions. These questions can include 'when did your problem

start for you?' or 'was there any obvious triggers'. However despite careful initial questioning patients may not disclose important information to the nurse for a variety of reasons. There may be contributing factors such as medication, diet or abuse that may manifest in various ways including constipation [8].

Thus it can be seen that a thorough assessment is necessary for patients with constipation. This process needs to include taking a patient's medical, surgical and drug history. It is essential that selected symptoms such as rectal bleeding are investigated to exclude a bowel cancer.

Specific questioning is necessary about the bowel function to include bowel symptoms, usual and current bowel habit and stool consistency. How the patient passes faeces is also investigated to include digitation and straining. Other bowel related symptoms need to be examined such as a sensation of incomplete evacuation, pain or bloating. Faecal incontinence may be as a result of damage to the anal sphincters or it may be faecal overflow [3].

The physical assessment process includes observation of the perianal area to look for other related or concurrent issues. More invasive procedures include a digital rectal examination and balloon expulsion.

Constipation can greatly affect the patient's quality of life so using an appropriate tool to evaluate this is also necessary. Nurses and Physiotherapists may be ideally placed to undertake an assessment and plan treatment for this group of patients. The advanced assessment skills, time spent and the experience of the healthcare professional facilitates an open disclosure on a difficult subject thus allowing the patient to feel comfortable and safe disclosing personal and sensitive information [3].

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Goal-Oriented Patient Care: An Alternative Health Outcomes Paradigm

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Causes of Faecal Incontinence

7

Rhian Sunderland and Lorraine O'Brien

7.1 Introduction

Continence is a complex bodily function relying on several factors. A combination of a normal transit of a normal consistency of stool (Type 3–4, Bristol Stool chart), a rectum with a normal capacity which provides a holding space with normal voluntary control and a fully-functioning sampling reflex provided by the anal sphincters [51].

Faecal incontinence is defined as involuntary leakage of liquid or solid stool at a socially inappropriate time [6]. The term anal incontinence is used if including flatus incontinence within the definition of faecal incontinence [1].

7.2 Measuring Faecal Incontinence

Measurement of faecal incontinence is difficult due to its subjective nature and some might argue that it should be assessed as simply present or absent [5]. This does not allow for assessment of clinically important changes such as assessing the severity of the patient's symptoms, nor does it reflect on how the patient's quality of life is affected. The subjective perception of the patient must always be considered when trying to evaluate faecal incontinence in a clinical setting. This means that a symptom based approach rather than a disease based approach is needed [79], as it encompasses a subjective assessment i.e. how the patient would describe their symptoms and in their own words how it is affecting their lives. This is not to say that objective measurements are not needed. Measurements such as anorectal manometry, endo-anal ultrasound and electrophysiology testing are necessary in determining possible causes for faecal incontinence in a measurable way [79].

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Most commonly used measuring tools for faecal incontinence include the Wexner score and St Mark's scoring system, [93] which are both severity measures. In a study by Seong et al. [79], they were compared to establish if there was correlation between the severity measure and the patient's subjective perception. The study found that the Wexner, Vaizey (St. Mark's score), Rothenberger and Faecal incontinence Scoring Index (FISI) all had significant correlation. Of the scores, the highest was seen with the Wexner score and the lowest with the Rothenberger score. The St Mark's score however has been shown alongside the Wexner score to reflect well a patient's subjective view on how treatment for faecal incontinence has affected their symptoms [22]. Much of the research into these scoring systems displays a lack of assessment of symptom severity *and* quality of life for people with faecal incontinence. The International Consultation on Incontinence Questionnaire Bowel (ICI-QB) has been reported for use as a "psychometrically robust" instrument for the evaluation of anal incontinence and quality of life [18]. Cotterill et al. [18] conducted quantitative studies to assess its psychometric properties. This demonstrated the questionnaires ability to provide "acceptable validity, good to very good reliability and reasonable response to changes in symptoms and quality of life status". The ICI-QB is completed by patients and consists of three groups of questions assessing; bowel pattern, bowel control and quality of life.

For many individuals the cause of faecal incontinence is complex and has many contributing factors. It can be a serious and debilitating problem which is so often taboo, as it has many implications upon individuals socially and medically. It also impacts the health service economically and is estimated to cost the NHS £82.5 million annually.

This lack of ability to control the bowels very often comes with a withdrawal from everyday life and social interaction. This can affect people's ability to maintain both personal relationships with family and friends such as breakdowns in marriages, withdrawal from socialising and working relationships. They feel unable to talk to their anyone about this taboo subject. Lack of communication can even be seen in individuals who do not experience "frank" incontinence but minor incontinence such as faecal smearing. They can become so pre-occupied with the embarrassing nature of the problem (odour, staining of clothes, flatus) and fear of it occurring in a social situation, that they may isolate themselves from social interaction and activity.

This embarrassment of faecal incontinence can vary greatly for individuals but very often will prevent many from seeking help [3]. This is the major reason why faecal incontinence's true prevalence is unknown. It is estimated that for anal incontinence (incontinence of flatus and faeces) 2–17 % of people within the community struggle with this problem [49, 97].

It is largely thought that the prevalence among women is higher than that of the male population due to the high incidence rate of obstetric trauma sustained by women during child birth following vaginal deliveries. However in a study by Perry et al. [72] no sex difference was found when they studied the prevalence of faecal incontinence. Studies into the prevalence of male faecal incontinence are few but

from their research, Perry et al. [72] feels their results indicate a high level of unmet need. This suggests that levels of embarrassment are far higher in males than females.

It is likely that 0.5 %–1 % of adults who experience faecal incontinence on a regular basis have some sort of effect on their quality of life (NICE [66]). Much of the available research focuses mainly on the causes and symptoms. Little is known about the true impact this has on an individual's life. [71] completed a cross-sectional multicentre study into the prevalence of faecal incontinence and quality of life impact. The prevalence of faecal incontinence was 10.8 % (518 studied), 51.8 % were found to have an altered mental state. They concluded that faecal incontinence is a significant independent factor for altering mental health.

Age is one of the major predisposing factors in the development of faecal incontinence especially in those residing in care homes. It is estimated that prevalence rises to 25 % for both sexes (Brown et al. 2013) and is a likely challenge to healthcare services and care homes as life expectancy continues to rise with improvements in medical care.

The main cause of faecal incontinence is obstetric trauma. This is likely the reason why it is thought prevalence is higher in the female population. Other common triggers include; pudenal nerve neuropathy, iatrogenic causes such as damage to the sphincter muscle during a surgical procedure (most common causes of faecal incontinence in young adults), Neurological diseases including those of a degenerative nature, increased gut motility and idiopathic causes [37]. A summary of the most common causes is illustrated in the table below (see Table 7.1)

The Royal College of Obstetricians and Gynaecologists [78] report an increase in the rate of obstetric injury in England. Their investigations show obstetric trauma has tripled from 1.8 % to 5.9 % from 2000 to 2012. The overall incidence rate in the UK is now 2.9 %. This increase does not necessarily indicate poorer quality of care but rather may indicate improvements in quality of care through better detection and reporting of obstetric injuries.

Post natal faecal incontinence is seen to develop in a 10th of women [6], symptoms include faecal urgency, poor flatus control, and passive or urge faecal incontinence. Flatus incontinence will improve on its own in two-thirds of women within the first year after delivery [61] however, incontinence to solid stool persists in approximately 3 % [52]. Suffering a perineal tear of 3a or higher will greatly increase the likelihood of developing defecatory symptoms, studies have shown that women who sustain a grade 3c/4 tear have a significantly poorer outcome compared to women with a grade 3a/3b (De Leeuw et al. [20, 77]).

7.3 Childbirth and Anal Incontinence

The incidence of sphincter trauma related to child birth is relatively high but is much improved over the years thanks to developments in modern medical management, it is however still a significant problem according to Marsh et al. [55]. They studied 435 women who had sustained an obstetric anal sphincter injury over a 5 year period after undergoing surgical repair. Of these women, 96 % were

Table 7.1 Causes of faecal incontinence in adults

Primary problem	Common causes
Anal sphincter or pelvic floor damage	**Obstetric trauma** **Iatrogenic (haemorrhoidectomy, anal stretch, lateral sphincterotomy, gynaecological surgery)** **Idiopathic degeneration** **Direct trauma or injury (e.g. impalement** **Congenital anomaly**
Gut motility/stool consistency	**Infection** **Inflammatory bowel disease** **Irritable bowel syndrome** **Pelvic irradiation** **Diet** **Psychological state, e.g. anxiety**
Ano-rectal pathology	**Rectal prolapse** **Rectocele** **Anal or recto-anal fistula** **Haemorrhoids or skin tags**
Neurological disease	**Spinal cord injury** **Multiple sclerosis** **Spina bifida/ sacral agenesis (usually secondary to constipation)**
Secondary to degenerative neurological disease	**Alzheimer's disease**
Impaction with overflow "spurious diarrhoea"	**Institutionalised or immobile elderly people**
Lifestyle and environmental	**Poor toilet facilities** **Inadequate care? Non-available assistance** **Drugs with gut side effects** **Frailty and dependence**
Idiopathic	**Unknown cause**

incontinent of faeces 3 months post repair, 34.2 % reported faecal urgency and 25 % suffered reduced flatus control.

As can be seen, damage to the anal sphincters is common but very often goes undiagnosed at the time of delivery (see Fig. 7.1). In those with a recognised third degree tear, between one-third and two-thirds will suffer from faecal incontinence [67] and it is estimated that only 0.6 % – 9 % of patients with third or fourth degree tears are identified at the time of delivery (Adams and Fernando [2]).

Dudding et al. [23] carried out a systematic review of 451 studies to identify the factors known to put women at risk of obstetric injuries. The risk factors included:

- Instrumental Delivery
- Prolonged Second Stage of Labour
- Birth Weight more than 4kg
- Fetal Occipitoposterior Presentation
- 1st Vaginal Delivery
- Induction of Labour
- Epidural Anaesthesia
- Early Pushing

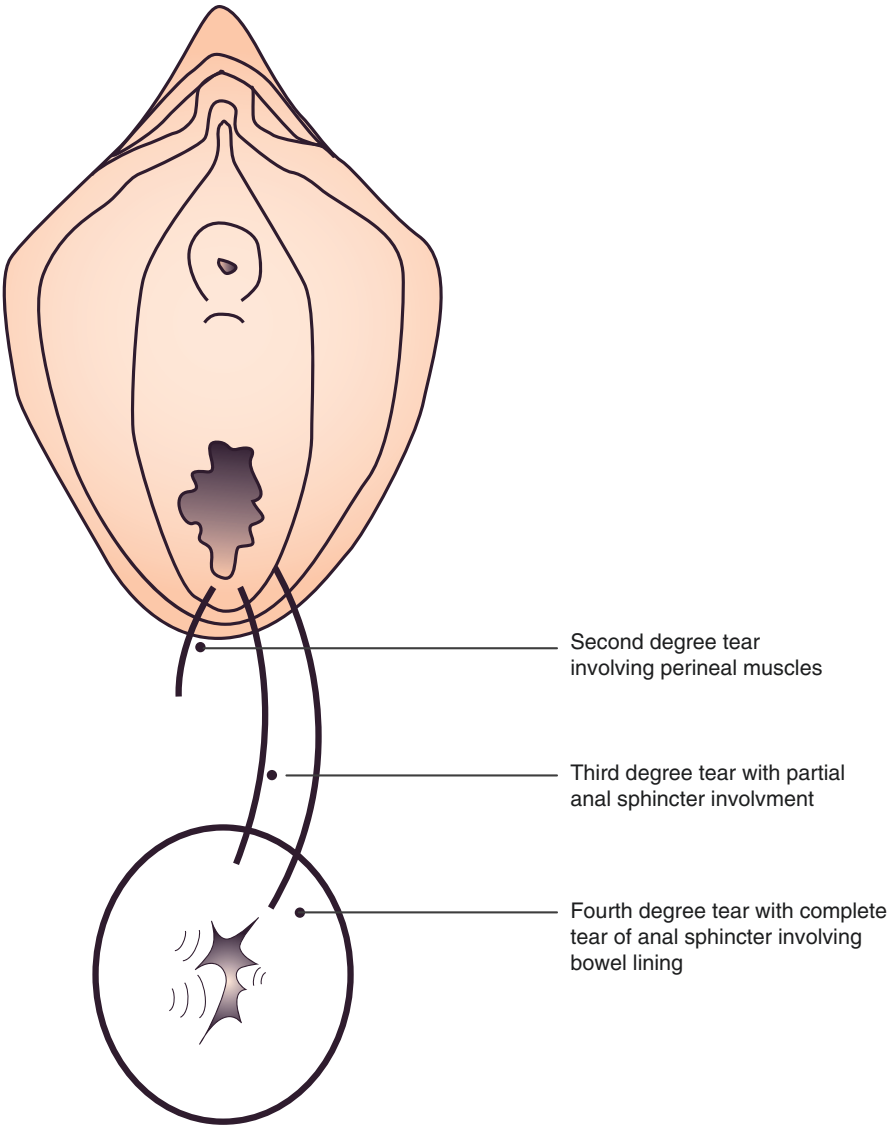

Fig. 7.1 Classification of obstetric tears

– Active Restraint of Foetal Head During Delivery
– Obesity

The Royal College of Obstetricians & Gynaecologists (RCOG) have developed guidelines to inform and steer clinicians when treating obstetric perineal tears and traumas. Although these guidelines have been developed, it is important that each maternity unit has their own set of protocols which clearly communicates local protocols for the management of obstetric injuries. The classification of perineal

Table 7.2 Classification of perineal tears

1st degree tear	**Limited to the vaginal epithelium or perineal skin only**
2nd degree tear	**Extends into the perineum damaging the perineal muscles**
3rd degree tears	**Involve the anal sphincter muscles and subdivided into**
(A)	**Less than 50 % of external anal sphincter thickness torn**
(B)	**More than 50 % of external anal sphincter thickness torn**
(C)	**Internal anal sphincter torn**
4th degree tear	**Damage to both anal sphincter muscles and to the rectal mucosa or anal epithelium**

tears has been adopted by the International Consultation of Incontinence and The RCOG. They recommend using the guidelines when describing any obstetric anal sphincter injury to ensure consensus (Table 7.1 and 7.2).

For women sustaining a tear to the anal sphincters there are two different stitching techniques. The first one requires the edges of the muscle to be overlapped. The second technique is where the edges of the muscle are sewn together, end-to-end. This is discussed in more detail in the chapter pertaining to surgical management of faecal incontinence. Overlap repair, if carried out immediately after childbirth, appears to be better in reducing the risk of developing symptoms of faecal urgency and incontinence [28, 84].

The evidence into whether or not having a further vaginal deliver after sustaining a third or fourth degree tear or opting for a caesarean section is not conclusive; this is dependent on assessing risks of further injury to the perineal and anal junction verses the risks associated with that of a caesarean section. A caesarean section is major abdominal surgery with its own inherent complications, such as maternal death and implications for subsequent deliveries. The incidence of postpartum urinary and faecal incontinence is higher in women with a previous perineal injury – although a caesarean section is not entirely protective of incontinence [62, 98]. Nelson et al. performed a review of 21 non-randomised studies totalling 31,698 women, their study aimed to ascertain if caesarean section reduced the incidence of anal incontinence, they could identify no benefit for caesarean delivery over vaginal deliveries. Their review identifies the need to look at effects of pregnancy itself on the development of post natal incontinence and not just labour.

7.4 Anal Fissure

An anal fissure is a linear tear or split in the lining of the anus (mucosa) which extends below the dentate line to the anal verge [53] and can cause severe pain due to spasm of the internal sphincter muscle and bleeding when passing stools, this can persist for some time afterwards [64]. Spasming of the internal sphincter can lead to reduced blood flow and delayed healing. Most fissures heal spontaneously however some can become chronic when symptoms persist after 4–6 weeks [53]. Anal fissures are regarded as a common problem by colorectal surgeons however the

prevalence is not widely investigated. Mapel et al. [53] performed a retrospective analysis of epidemiology and treatment of anal fissures and found that incidence is overall higher in women and this peaked during adolescence and early adulthood, whereas in the male population incidence was higher in middle age.

Lateral internal sphincterotomy has been widely accepted as the treatment of choice in treating chronic anal fissures and is confirmed in most of the recent research around this topic [14, 53, 100] and is generally regarded as the 'gold-standard' treatment by many Colorectal surgeons [73]. The lateral sphincterotomy succeeds by reducing the resting anal sphincter strength. This procedure can be associated with a risk of flatus incontinence and passive leakage in 10 % of cases [64]. A study by Murad-Regadas et al. [59] found that the episodes of faecal incontinence are reduced if no more than 25 % of the internal anal sphincter is divided, and this symptom is likely to resolve 8 weeks post surgery [21].

Surgical trials have found that an anal stretch has a significantly higher risk of incontinence and treatment failure than when compared to a controlled sphincterotomy. As a result it is no longer a common procedure (Nelson [63]). Increasingly, medical treatments are now adopted prior to surgery. These include pharmacological methods such as GTN (nitroglycerin ointment) and diltaziem to relax the anal smooth muscle as well as injections of Botox (botulinum toxin) [64]. All of which have shown a lesser risk of developing faecal incontinence than undergoing such procedures as a sphincterotomy [41] however such pharmacological and non-surgical interventions may be better suited to those patients who may have refused surgery, previous sphincter surgery or for those at particular risk of incontinence with sphincterotomy.

7.5 Haemorrhoids

Surgical haemorrhoidectomy can result in faecal incontinence by reducing mean resting pressures and external sphincter injury. In a retrospective multi-centre study into the long-term results of haemorrhoidectomy, it was found that 139 (33 %) of the 418 patients that replied to questionnaires reported impaired anal continence. Forty of those reported that the haemorrhoidectomy was a direct cause of their symptoms (Johannsson et al. [44]). In a more recent study by Johannsson et al. [45], they found that of 418 patients having Milligan haemorrhoidectomies (open haemorrhoidectomy), 40 reported symptoms of faecal incontinence (16.72 %).

7.6 Anal Penetration

Accidental blunt and penetrating injuries to the anorectum are not common. Injuries can occur following road traffic accidents or climbing over fences, however the bony pelvis offers some protection to blunt injuries (Herzig [38]). There is some debate about whether sexual use or abuse of the anus is a cause of faecal incontinence. Some evidence suggests that unwanted or forced anal sex can cause direct anal sphincter injury [27]. However, consensual anal sex does not appear to cause sphincter damage [16].

7.7 Congenital Anomalies

Hirschsprung's disease and imperforate anus are both examples of congenital anorectal malformations. Hirschsprung's disease is quite a rare disease found in 1:5000 of new born babies. It is caused by aganglionosis of the distal bowel [75], meaning there is an absence of ganglion neurol cells of both the myenteric and submucosa plexus in the gut wall [32]. Its prevalence is more common in boys than girls (4:1) [32, 81]. Imperforate anus, similar to Hirschsprung's disease occurs in 1:3000–5000 new born babies and also occurs more commonly in males [87], it is identified as a malformation of the rectum however its cause is unknown although a genetic influence has been identified as a cause in 8 % of patients [58]. There are many forms of imperforate anus (see Fig. 7.2).

Both congenital anorectal malformations lead to a high proportion of babies undergoing surgery. This may be an anorectoplasty, or a "pull through" perineoplasty procedure, where the rectum is mobilised and pulled through a surgical incision made to open the perineum. The aim is for the pull- through to occur through the centre of any residual anal sphincter muscle, so that the neo-anus is surrounded by the muscle present [32, 48], however this is dependent upon the abnormality present. Generally the outcomes following surgery are good and most develop adequate bowel control, this is of course dependent on the degree of defect pre-operatively [36]. For those with more complex defects, development of functional problems can occur from persistent severe constipation to faecal soiling or frank incontinence ([36]; Rintala and Pakarinen [75]). This can be due to; a thinned pelvic floor or anal sphincter muscle, misplacement of the pull through procedure [30] or inadvertent interference during surgery resulting in a loss of anal sensation. Loss of anal sensation causes a defective anal sampling reflex resulting in alterations in discriminating between solid and liquid stools and flatus (Rintala and Pakarinen [75]; Thomas et al. [87]). The incidence of developing incontinence has been reported in between 36 and 48 % of adults and adolescents ([40]; Jarvi et al. [43]) with varying degrees of incontinence from mild staining to more frank episodes.

The long term functional outcomes for this group of patient in terms of faecal incontinence are optimistic, most adolescent and adult patients are able to remain

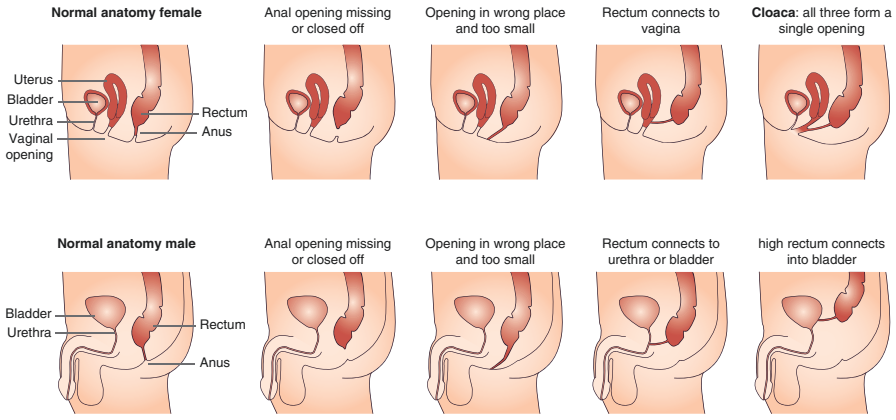

Fig. 7.2 Forms of imperforate anus

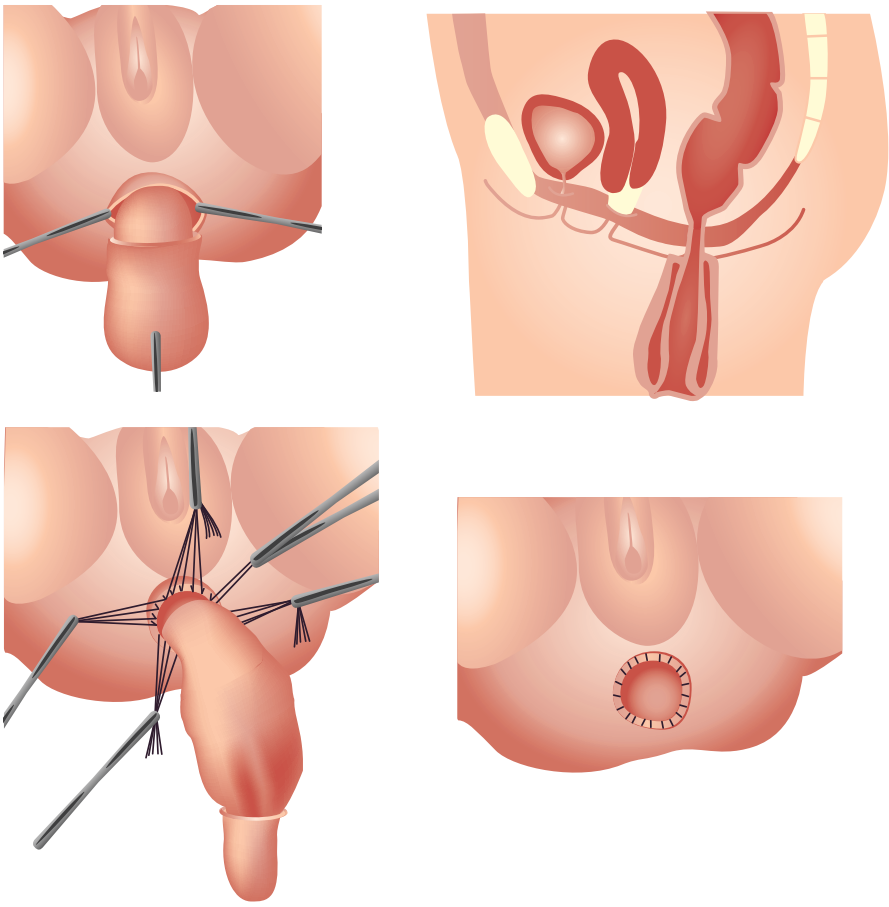

Fig. 7.3 Operative steps of pull through procedure for Hirschsprungs disease

continent in social situations with the use of bowel management strategies and programmes and many of their symptoms appear to improve significantly with age, particularly post-pubescently (Fig. 7.3).

7.8 Gut Motility/Stool Consistency

Loose stool bowel movements can contribute to episodes of faecal incontinence. Acute episodes of diarrhoea occurring with a gastrointestinal infection results in frequency, flatulence and urgency and can diminish the ability to hold on long enough to reach the toilet in time. There are many causes of chronic diarrhoea; side effects of medications (see Table 7.3), intolerance to food substances e.g. gluten in coeliac disease or dairy, and anxiety. In addition to these, some chronic conditions of the bowel such as inflammatory bowel disease (including ulcerative colitis and

Table 7.3 Medications which cause diarrhoea

Antacids and nutritional supplements containing magnesium
Non-steroidal anti-inflammatory drugs (NSAIDs)
Chemotherapy
Antibiotics
Statins: cholesterol lowering medicines
Selective serotonin reuptake inhibitors (SSRI's) – antidepressants

NHS choices [65]

Crohn's disease), can cause loose stools. Responders in a study of patients with IBD found 74 % reported episodes of faecal incontinence [69].

7.9 Irritable Bowel Syndrome (IBS)

People diagnosed with Irritable bowel syndrome (IBS) are categorised in 3 brackets; IBS-constipation, IBS-Diarrhoea and IBS-mixed when symptoms can alternate between constipation and diarrhoea. IBS-diarrhoea caused as a result of an accelerated gut transit time can cause patients to be at risk of faecal incontinence. It is also true that IBS-constipation sufferers can experience faecal incontinence which is commonly due to overflow caused by faecal impaction. This is also known as paradoxical diarrhoea (encopresis) when liquid stool passes around the obstruction.

In a study of patients with faecal incontinence, excluding those with obstetric injury, rectal prolapse or previous anorectal surgery, 44 % had IBS symptoms [13]. In another study of 500 IBS patients (IBS-constipation, diarrhoea and mixed), 285 (57 %) reported faecal incontinence and of those patients 31.9 % reported their incontinence as severe. The prevalence in IBS-diarrhoea was reported at 65.2 %, 63.7 % in IBS-mixed and 37.9 % in IBS-constipation (Atordi et al. [4]).

7.10 Surgical Intervention

Bowel surgery often referred to as Colectomies are performed to remove cancerous tumours or diseased tissue from all or part of the colon. Following surgery patients are prone to changes in their bowel habits with up to 90 % of patients who undergo bowel surgery having subsequent changes in their bowel habits [9]. This ranges from increased frequency, faecal incontinence or evacuation dysfunction. An Anterior Resection is performed to remove the sigmoid colon and upper part of the rectum, removal of this storage chamber causes a loss of rectal capacity [9]. This may result in "Anterior Resection Syndrome" which is typically characterised by motility changes of the colon and neo-rectum [9]. These symptoms often subside within 3–9 months of surgery [85], however they can take up to 18 months or longer in reality. Patients experience increased faecal urgency due to the reduction in rectal capacity, alteration in external anal sphincter function and poor co-ordination of muscles used in defecation. This is caused by a disruption of the nerves during surgery. These symptoms result in the loss of bowel control and anxiety which will often further exacerbate patient's symptoms.

7.11 Ano-Rectal Pathology

Minor anal conditions such as skin tags and haemorrhoids can make cleaning after a bowel movement difficult and lead to passive soiling of stool or mucus. A rectal prolapse can lead to faecal incontinence due to weakness of the pelvic floor and anal sphincters [26].

Anorectal fistulas are an abnormal connection or cavity between the anorectal mucosa and the perianal skin and may track through the sphincter muscles [60]. There can often be, but not always, the development of an external opening. Fistula's occur spontaneously or following the rupture or drainage of a perianal abscess. It has been reported that in 25–37 % of perineal abscess drainage cases seen most commonly in inflammatory bowel disease, a fistula-in-ano developed (Vasilevsky and Gordon [39, 91]). The main school of thought for their development is the Cryptoglandular hypothesis [68]. An infection begins in the anal (Crypto) gland and progresses into the anal sphincter muscle to cause an anorectal abscess. The development of such a cavity in the sphincter muscle can leave people at risk of incontinence, as well as persistent problems with perineal pain, chronic discharge and bleeding. Fistula's develop mostly around the age of 40 in both males and females

Surgeries for an anorectal fistula may unavoidably cause disruption of the anal sphincters by "laying open" of the fistula tract (fistulotomy) [42], whereby the fistula track is laid open to allow for healing to occur [88]. Deeper or more complex fistulas may have to be treated with the insertion of a seton. This is a monofilament nylon material which is inserted along the track of the fistula and tied, allowing drainage and fibrosis (See Fig. 7.4). The advantage of using a seton is that of a "staged fistulotomy". It allows for progressive division of the sphincter muscle and hopefully avoiding the complication of incontinence, however this is not always the case and many people do go on to develop incontinence as a result. Long term studies of patients following fistulotomy, abscess drainage and with suprasphincteric fistula tracts saw a 34 % incidence rate of developing faecal incontinence as a result [95].

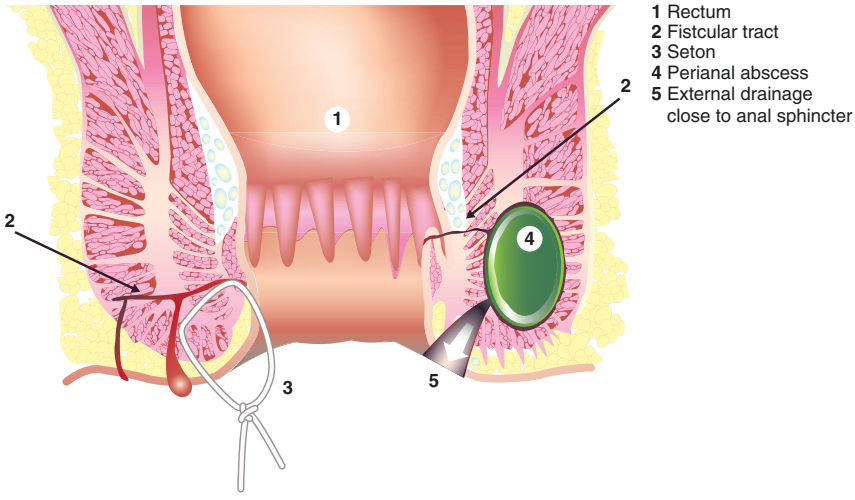

Fig. 7.4 Anal pathology abscess/fistula and seton placement

7.12 Neurological Conditions

People with a neurological disease or injury are at a much higher risk of experiencing symptoms of both faecal incontinence and constipation than those of the general population [17]. This is known as neurogenic bowel dysfunction (NBD). Symptoms of faecal incontinence are common in patients with spinal cord injury, myelomeningocele, Multiple sclerosis, Parkinson's disease and stroke. Stroke is the most common cause of neurological damage in western countries (Wiesel and Bell *in* Norton and Chelvanayagam [68]). Damage to part or all of the central nervous system, dependent on the level at which the injury occurs will result in partial or complete loss of voluntary and involuntary motor and sensory control in the pelvic floor and rectoanal complex [17].It is mainly due to abnormal rectosigmoid compliance and rectoanal reflexes, loss of rectoanal sensibility and loss of voluntary control of the external anal sphincter [50].

Coggrave et al. [17] carried out a Cochrane review of faecal incontinence in adults with central neurological diseases. They provided a summary of their findings for the estimated prevalence of faecal incontinence:

- 23 % of those following a cerebrovascular accident
- 24 % of those diagnosed with Parkinson's disease
- 56 % of people with cerebral palsy
- 68 % of individuals with spina bifida
- Up to 70 % in those with multiple sclerosis, and
- 75 % with spinal cord injuries [17]

Loss of bowel control in this group of individuals can be due to; altered cognitive function, inability to mobilise independently and subsequently loss of independent toileting, loss of ano-rectal and pelvic floor sensory function, deficiency in pelvic floor muscle control and from side effects of pharmacological medications (Wiesel and Bell in [68]).

National Institute of Clinical Excellence (NICE) guidelines [66] state that each person with faecal incontinence related to a spinal cord injury or NBD should be offered a neurological bowel management programme. This programme aims to help them to achieve a normal stool and a more predictable bowel routine, helping them to avoid episodes of faecal incontinence in the future. This programme should be patient centred on their wants and needs and based upon their premorbid bowel habits.

7.13 Age Related/Degenerative Conditions

Faecal incontinence affects many of the elderly population. This is so in 3–18 % of people aged 65 and over and living in their own homes. This figure increases further in those living in a care home setting and can quite often be the cause for their admission into such care institutions [24, 94]. Chassagne et al. [12] conducted a study into the incidence and risk factors of faecal incontinence in the institutionalised elderly. The study found that of the 1186 patients aged 60 and over, faecal incontinence occurred in 20 % (234 patients) of the population. They identified that a history of

urinary incontinence, neurological disease, poor mobility and severe cognitive decline were risk factors in the development of faecal incontinence. They also concluded that long-lasting or permanent faecal incontinence was closely associated, as an increase in mortality was identified in 26 % of their population. In elderly patients who have a diagnosis of Dementia, faecal incontinence was found to be more than four times higher than in elderly patients with normal cognitive function [31].

In addition to this, many of the elderly population are at risk of faecal incontinence due to overflow [83]. This is an important and very common complication in elderly patients with constipation which is easily treatable. Patients will appear distended with abdominal discomfort, often confusion, unexplained fever and non-specific deterioration in frailer patients [68].

It has been identified that there is a lack of good management in the care of the elderly population who experience faecal incontinence. Six hundred geriatricians were asked to complete a questionnaire on their management of faecal incontinence among the elderly, 54.1 % reported that they screened for faecal incontinence. Only 32.9 % believed that nursing homes provided good care for those with this problem and 27.1 % believed an institution/care setting would exasperate the problem [70].

Those suffering from dementia may have difficulty in feeling and understanding rectal contractions. This is due to the lack of voluntary control brought on by dementia by the brain over the sphincter mechanism and rectum [34] – often with a loss of inhibitions needed to maintain continence. They can also struggle to communicate their needs effectively and become confused within their environment. Impairments to memory or expressive and receptive aphasia hugely impede continence [7].This is supported in a large UK national audit of 3059 patients looking into incontinence care and the management of faecal incontinence for older people. Their sample had high levels of cognitive and functional impairment (stroke, dementia and impaired mobility) 32 % in primary care, 59 % in hospitals and 84 % in care homes had a combination of cognitive impairment and faecal incontinence [74].

In a study of 61 continent women, it was found that over time as they aged there were reductions in; resting and squeeze pressures of the anal sphincters, reduced rectal sensation and compliance as well as perineal laxity [29]. Research evidence has shown that more than 30 % of females aged 70 years or over have a higher prevalence of faecal incontinence [90], compared to those who are under 49 years (18 %). This can be attributed to degeneration of the internal anal sphincter smooth muscle without denervation, structural damage, external sphincter weakness, or sensory abnormalities and endoanal ultrasound reveals a thin internal sphincter muscle [92]. Kerkhof et al. [47] state that age related changes in connective tissue and muscle occur due to slower metabolism of collagen and elastin in mature tissues. “Over mature” collagen and slow reproduction of collagen and elastin causes thinner and weaker muscles and connective tissue in the older generation. This is further affected in post menopause when reduced oestrogen levels leads to a loss in fibrin and elastin production.

Overall, age-related anatomical changes such as reduction in resting and squeeze pressures of the external and internal anal sphincters (due to weakening of the anal sphincter and pelvic floor muscles) and increase in rectal sensitivity all contribute to a loss of continence [80].

7.14 Environmental Influences

The environment for those with physical or mental impairment can affect their ability to maintain continence. This is particularly so in those who live in institutional care settings where they are often much more reliant on the help and care of others to help with toileting. Some environmental factors which can be influential on all people are such things as; poor access to toilets, lack of equipment, lack of equipment aids, difficulty removing clothing and inadequate staffing in residential and care settings (NICE [66]).

- **Poor access to toilets**, for example when shopping or in public places. People may also be put off using these toilet facilities due to lack of privacy and inadequate facilities. For those who have been diagnosed with a medical problem causing them to have continence problems toilet cards and Radar keys can be purchased for a small fee from a number of sources which will allow quick and easy access to public or disabled toilets (www.bladderandbowelfoundation.org; www.theibsnetwork.org; www.radarkeys.org). Although this does not guarantee each person access to all toilets, most places they visit should be willing to assist on display of the card.
- **Lack of equipment aids** – such as toilet frames, toilet raisers or lack of adjustable toilet height which does not suit individual's needs (those with mobility or hip problems) can make toilet accessibility very difficult. This can be so; within peoples own home environments, in the public domain and care settings [86]. In many cases this will often lead to increased distress and anxiety which during that moment of need will likely make their immediate symptoms worse by increasing the sense of urgency. This can often lead to avoidance of public places or social environments.
- **Difficulty removing clothing** – tight fitting clothing, buttons or other fastenings can often be difficult for those with dexterity or cognitive problems. They may have difficulty manipulating fastenings in a hurry. It is advisable, where possible for those with faecal urgency and incontinence to wear looser fitting clothing with elasticated waistbands to allow them quicker access and help reduce episodes of faecal incontinence.
- **Inadequate staffing** in care settings can result in residents waiting to be assisted in their toileting needs. Staff who are over worked and stressed might often seem frustrated at persistent calls from those requiring toileting assistance more frequently. This can often lead the individual to ignore the desire to empty their bowel and over time will lead to risk of developing impaction and resultant overflow [35].

7.15 Lifestyle Factors

7.15.1 BMI

There are a number of lifestyle choices which contribute to and impact upon the development of faecal incontinence in adults. An increased Body Mass Index (BMI) has been identified as a significant risk in the development of faecal and urinary incontinence [54, 76, 89, 90, 96]. It is reported that faecal incontinence is 50 % more prevalent in the obese population than in those of normal weight ([90]; Melville et al. [25, 57]).

In a population-based study of 2109 females by Varma 2006, it was found that 511 of these had faecal incontinence and of those 35 % were women with a BMI of ≥40 (obese to morbidly obese). Increased abdominal pressure, weakened pelvic floor and increased stool motility due to a lower dietary intake of fibre are identified as the main resultant causes of this problem [54].

Obesity is a modifiable state, however for many the prospect of weight loss is daunting. With the right support and reassurance of the potential benefit this would have in reducing their faecal incontinence, many could be motivated to undertake the intimidating task of dietary change.

7.15.2 Smoking/Nicotine

There is little evidence to support the effect of nicotine/smoking and faecal incontinence. The general school of thought is that smokers often experience frequent violent episodes of coughing therefore repeatedly putting the pelvic floor under pressure and resulting in weakening of the muscles. There is however research into the effects of nicotine on the bladder and urethral sphincters which all hypothesise similar schools of thought as of the one mentioned above. However it has also been noted that smokers are at greater risk of experiencing anti-oestrogenic hormonal effects on the bladder or urethra and a reduction in collagen synthesis [19] resulting in urinary incontinence but could also have a similar effect on anal sphincter function. In addition to this nicotine is known to be a stimulant drug which causes a surge in the release of adrenaline immediately after inhalation; this therefore would cause increased contraction of the colonic and rectal muscles in the form of peristalsis leading to an increased desire to empty the bowel [11].

7.15.3 Exercise

Participation in high impact or excessive amounts of exercise can result in weakening of the pelvic floor. This damage can lead to development of complications such as rectal prolapse or rectocele which can often result in symptoms of urinary or faecal incontinence (Meidel et al. [56]; Bump and Norton [10]). Those who work in occupations which require a lot of heavy lifting will be at high risk of experiencing symptoms of a pelvic organ prolapse, particularly nurses, factory workers and housewives [15, 46, 99].

Lifestyle choices are adaptable and ultimately *choices.* This means, with compliance, education and support these can be modified or changed to improve symptoms.

7.15.4 Idiopathic Incontinence

Despite all the available assessments and investigations there are a group of patients whom we may never identify a definitive cause for their symptoms of faecal incontinence. This group of patients are termed as having “functional” or

"idiopathic" faecal incontinence. It is believed that idiopathic incontinence is associated with impaired ano-rectal sensory functions [33, 82] resulting in an impaired anal sampling reflex which lessens a person's ability to maintain continence. Treating this with an patient-centred bowel management and behaviour modification programme or Biofeedback has shown good success rates in improving these distressing symptoms.

Conclusion

Continence is a complex problem with many possible causes some are very common and others which are seen less frequently. Presentations may be multifactorial requiring a dynamic, person-centred approach to assessment and treatment. It is important that any underlying pathologies are first ruled out with diagnostic testing prior to the commencement of treatment. Faecal incontinence is a very sensitive and personal problem which can be devastating to the person experiencing it, unfortunately it remains a subject which is not openly talked about. This can lead patients to be reluctant in pursuing professional input. Seeking treatment is often delayed until symptoms become more severe and no longer manageable for the affected person. This in turn can lead further diminished quality of life and social isolation. It is important that treatments are approached with empathy, in a safe and positive environment allowing the opportunity to share openly about their symptoms.

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The Assessment of Faecal Incontinence

8

Elissa Bradshaw and Rebecca Knox

8.1 Introduction

This chapter will explore the Biofeedback assessment of patients with faecal incontinence. It aims to describe and discuss the healthcare professionals' role in systematic assessment. It is only by obtaining the most accurate and individualised assessment that we are able to obtain the pertinent information and undertake a high standard of treatment planning for the patient group [32]. A detailed assessment is required, which leads to a systematic approach to management [13]. Ideally the assessment and follow up sessions should be conducted by the same therapist for consistency and continuity [12].

The proforma assessment presented here includes the initial assessment sheet and follow up assessment to monitor progress; these were designed by nurses and physiotherapists working in the Biofeedback department at St. Marks Hospital. It has evolved over the years to incorporate a more comprehensive anorectal assessment tool [22].

The mechanism of continence is complex [7]. It relies upon stool consistency, correct neural pathways and optimal rectal and sphincter complex function [3].

Faecal incontinence refers to the involuntary loss of solid or liquid stool from the anus [8]. It may result as a disruption to the required mechanisms or due to an unknown cause "idiopathic faecal incontinence". The causes of faecal incontinence are often multi factorial and the healthcare professional should avoid assuming that there is a single primary cause (diagnostic overshadowing) [29]. It is only through

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accurate assessment that the problem can be understood and appropriately treated. Treatment options for the management of faecal incontinence for will be discussed in the chapter on conservative management.

Biofeedback is a behavioural approach to managing bowel function [14].

It has been advocated as a treatment for functional bowel disorders in accordance with NICE guidelines and has been described as a "hybrid" therapy incorporating aspects of behavioral therapy, counselling and pelvic floor physiotherapy [43].

During the course of assessment the healthcare professional should be thorough in excluding any red flag symptoms. Change in bowel habit not pertaining to incontinence, abdominal pain, unexplained weight loss, loss of appetite or abdominal or rectal masses should have been thoroughly investigated prior to attending the Biofeedback clinic [24].

However, patients may not have previously reported these symptoms to their GP or new symptoms may have arisen during the interim period [24]. Any new or troubling symptoms that may become apparent during the assessment need to be discussed immediately by the healthcare professional with the appropriate bodies such as the MDT (multidisciplinary team) referring Consultant, or GP as soon as possible.

Faecal incontinence remains a taboo subject in western society. Urinary incontinence seems to be more widely discussed and adverts for urinary incontinence products are now appearing on television [17]. There are many causes for faecal incontinence and these are discussed in Chap. 7.

Some causes are reversible and it is only through accurate assessment that the healthcare professional can glean this information [42].

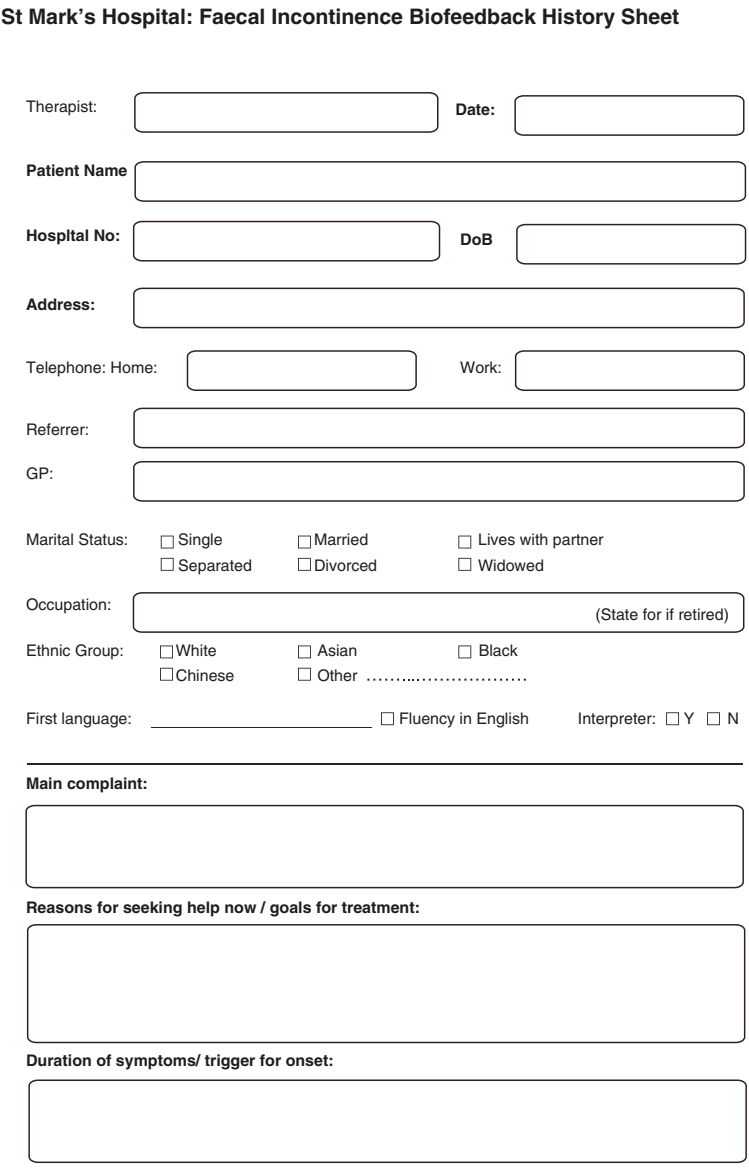
One of the many problems when studying the epidemiology of the subject is that symptoms are under reported due to the taboo nature of the problem, and definitions of what defines incontinence vary [41]. Faecal incontinence remains an under reported problem with many feeling too ashamed to discuss their symptoms with healthcare professionals [1, 29].

Nurses have been shown to manage faecal incontinence conservatively achieving high satisfaction rates amongst patients [18]. Assessment should be sensitively orchestrated. The right questions need to be asked and posed in such a way that open ended discussion can take place [33]. The discussion should be open, using terms that the patient is comfortable with, to build a relationship of trust [30]. The main focus of the primary assessment is on the sensitive exploration of the patients' symptoms, using language they will understand and with which they feel comfortable. The aim is to identify the causes and also to ascertain the severity of the symptoms and their impact on their quality of life [13]. Some of the most important skills are counselling skills, which involve the ability to talk to distressed or depressed client.

The subcategories of the assessment include exemplar questions. These can be used as a rough guide to obtaining the relevant information from the patient. Of course, there is no definitive guide to questioning and every patient is assessment is unique, but we hope these may serve to assist in gaining an insight into a Biofeedback assessment for incontinence.

The assessment comprises of two parts. The verbal assessment and physical examination using the anorectal assessment tool (See Fig. 8.1).

The assessment begins with an introduction and explanation of what biofeedback therapy involves, structure of the consultations, any interventions that maybe required and what the individual knows about biofeedback therapy, and what are their expectations of treatment. The patient can be given up to six consultations; the first is up to an hour long and will include a full medical history. This could provide an insight into the reason for the incontinence; this will include any medications the



St Mark's Hospital: Faecal Incontinence Biofeedback History Sheet

Therapist: **Date:**

Patient Name

Hospital No: **DoB**

Address:

Telephone: Home: Work:

Referrer:

GP:

Marital Status: ☐ Single ☐ Married ☐ Lives with partner ☐ Separated ☐ Divorced ☐ Widowed

Occupation: (State for if retired)

Ethnic Group: ☐ White ☐ Asian ☐ Black ☐ Chinese ☐ Other ……..……

First language: _____ ☐ Fluency in English Interpreter: ☐ Y ☐ N

Main complaint:

Reasons for seeking help now / goals for treatment:

Duration of symptoms/ trigger for onset:

Fig. 8.1 St. Marks hospital assessment of faecal incontinence

St Mark's Hospital: Faecal Incontinence Biofeedback Review Sheet

Session No: **Date:**

Patient Name & Hosp No:

Progress:

Faecal Symptoms:

Frequency: Consistency: BSFS

Urgency: Time can defer for: Urge incontinence:

Difficulty wiping? Recatal bleeding/mucus?

Post defaecation soiling: Passive soiling:

Amount of flatus: Control of flatus:

Nocturnal bowel problems? ☐ Yes ☐ No

Evacuation difficulties? Straining
Incomplete evacuation

Urinary symptoms Stress incontinence:
Urgency incontinence:
Nocturia:
Other:

Loperamide/other measures:

Dietary modification:

On examination: **Consent given for PR/PV examination:**
☐ Yes ☐ No

Fig. 8.1 (continued)

client is currently taking. The second, third and fourth consultation is thirty minutes, this will include progress reports and to identify any other problems that may have arisen due to lifestyle or dietary changes.

Prior to attending the Biofeedback Clinic patients are sent the ICI-QB questionnaire [16]. Most will complete these prior to attending. These provide baseline measures prior to commencing treatment. The data is then collected again at the end of treatment to show if the treatment has been successful in relation to personal subjective measures.

8.2 The Assessment

8.2.1 Main Complaint/Pre Morbid Bowel Pattern/Trigger of Onset

"What is the main problem for you?"
"When did you first notice this problem?"
"Did anything happen, or change with your health at the same time?"
"Why did you first seek help and what are your goals for treatment?"

First and foremost, it is important to ask the patient what the main problem is for them. The healthcare professional should take nothing for granted when assessing the most salient problems for each individual. The patient may not have divulged specific details to the referring healthcare professional, depending on time constraints, embarrassment or the questions posed. The patients' main problems may even be very different from the reason for referral.

The duration of the symptoms and any precipitating factors should be identified to ascertain any reversible factors [28]. For example the patient may have noted the onset of incontinence coincided with surgery (anorectal or gynaecological for example), new medications, adverse life events (stress), or hormonal shifts (start of periods or menopause). Some of these factors can be addressed such as a change in medications or help with particular stressors (such as onward referral for counselling).

8.2.2 Usual Bowel Pattern/Stool Consistency

"How often do you have your bowels open on the toilet?"
"What are the stools like?"

Asking how often the patient opens their bowels gives key information. Asking about the bowel pattern prior to the onset of incontinence sets the scene for the baseline or "normal" bowel pattern for the individual. It is also important to assess for any change in bowel pattern as a red flag symptom of underlying pathology [4].

Stool consistency of bowel motion is important [29]. Patients with consistently looser stool are more at risk of incontinence [9]. Simple recommendations to firm stool consistency up such as use of diet and medications can manage incontinence for many [10]. Patients may report frequent bowel evacuations but they are passing hard stools and actually constipated. Using a tool such as the Bristol Stool Chart remains very helpful in assessing the stool consistency (See Chap. 3 Bristol Stool Chart).

8.3 Faecal Incontinence How Often and How Much?

"How often do you notice leakage from the bowel?"
"How much do you think it is? Tablespoon? Teaspoon?"

This question should be asked as sensitively as possible. Even if patients have been referred for the problem they may be incredibly embarrassed discussing it.

Consistency of incontinence is pertinent. Loss of formed stool may indicate neurogenic bowel problems, nerve damage or impaction leading to overflow [15]. Frequency of incontinence denotes the severity of the problem and ascertaining when it happens is the mainstay of developing a robust treatment plan. In planning treatment it's helpful to differentiate between urge and passive incontinence [33].

8.4 Urge/Urge Incontinence

"Do you have to go in a hurry?"
"If you needed to go to have your bowels open, how long do you think you could put it off for?"

Asking questions relating to deferral indicate if urgency and urge incontinence are a predominant symptom. As discussed in earlier chapters urge incontinence often occurs as a result of external sphincter dysfunction. People will often adapt their lifestyles to avoid urge incontinence. They may not go out until they have emptied their bowels for example. They may avoid certain situations where they know there aren't toilet facilities. Some patients may have had very rare occurrences of urge incontinence but are perpetually afraid of it happening. Adaptive behaviours may be adopted to lessen any perceived risk. For example, some patients do not eat when out of the house as they fear a gastro colic response will precipitate bowel actions and possible incontinence. Asking how often is has actually happened can indicate the adaptations the individual has made. In some cases ability to defer defaecation outweighs the confidence of a patient to "hold on" but certain situations are avoided due to fear of incontinence.

8.5 Passive/Post Defaecation Incontinence/Mucus/ Faeculent

"Do you every have leakage with no warning at all?"
"When does this happen? Have you noticed it more after a bowel movement?"

Questioning the patient on involuntary leakage indicates possible internal sphincter dysfunction. Passive leakage which may, or may not occur, post defaecation indicates a damaged or thinned internal sphincter meaning there is not a complete seal on the anal sphincter complex [40]. This may occur particularly on or after exercise or exertion.

Loss of mucus passively may indicate other pathology such as a solitary rectal ulcer or a rectal prolapse [38].

8.6 Flatus Control/Sampling

"Can you control wind?"
"Do you ever go to pass wind but accidentally pass stool?"

In some definitions of incontinence loss of flatus control does not appear as true incontinence [25]. For sufferers it can be incredibly debilitating and a cause of anxiety in social settings. The ability to distinguish between stool and flatus may be lost where there is nerve damage such as after obstetric injury or anal surgery [1].

8.7 Evacuation Difficulties

"Do you need to strain to have your bowels open?"
"Do you feel empty after a bowel movement or do you still feel there is something left?"
"Do you ever need to use a finger to empty, into the anus or vagina?"
"Do you ever need to press from the outside to empty?"

Evacuatory difficulties can occur alongside faecal incontinence. A rectocele is a bulging of the rectum forward through a weakened recto-vaginal septum into the posterior wall of the vagina [14]. The presence of a rectocele may cause stool trapping, inability to complete emptying and resultant incontinence. Asking questions about evacuation of stool "do you need to strain, or insert a finger into the anus or vagina" can indicate the presence of a rectocele or an evacuatory dysfunction (such as failure to relax the anal sphincter complex, termed anismus) which may precipitate incontinence. Pelvic floor weakness can necessitate the need for digitation and or perineal or post anal support using the hand externally [35].

8.8 Prolapse/Bleeding

"Do you feel anything dropping down into the back passage/anus?"
"Do you feel heaviness in the bottom?"
"Do you feel as if something is in the way when you empty? Do you need to push it up or out of the way when you have your bowels open or after you've had your bowels open?"

As previously mentioned undiagnosed pathology may exist. Excluding other factors such as anal fissure, rectal prolapse or more sinister pathology such as inflammatory bowel disease or cancer is a critical part of assessment [4]. A sensation of prolapse may present as a heavy feeling at the anus or a need to manually reduce soft tissue following defaecation. A rectal prolapse will require surgical intervention and is said to account for more than 50 % of faecal incontinence [23].

8.9 Pads

"Do you wear a pad or plug?"
"Is that for the bladder leakage or bowel leakage?"
"How often do you need to change it?"

Some patients may wear incontinence pads or pant liners to contain incontinence, or to guard against the threat of incontinence "just in case". Some may wear pads for urinary incontinence predominantly and it's helpful to delineate between the rationale for wearing the pad in addition to how often the pad needs to be changed or has evidence of incontinence. Anal plugs or inserts may also be used for containment purposes [19].

8.10 Medication

"Which medications are you taking including non-prescription or over the counter medications?"

Many medications affect bowel motility [6]. Starting new medications can precipitate looser stool and lead to incontinence. Very commonly prescribed analgesics, Non-steroidal anti inflammatories, Statins and Serotonin reuptake inhibitors (SSRI anti-depressants) can cause diarrhoea [34]. Patients may not have disclosed use of herbal remedies to their referring clinician, some weight loss drugs or supplements, bought over the counter will induce diarrhoea.

Patients may use Loperamide Hydrochloride which is the first line treatment for diarrhoea in those where other pathology has been discounted. How often they take it, and ascertaining dosage is important. Many patients find the dose difficult to titrate without leading to constipation and are not aware that syrup is available to achieve small incremental dosage which will form stools in the absence of constipation [29]. Some patients are not aware that an optimum time to take Loperamide is 30–45 min prior to eating.

8.11 Previous Medical/Surgical History

Assessing medical and surgical history can identify precipitants of change in bowel function and continence. Aside from obvious causes of obstetric injury, gynaecological anorectal or colon surgery there may be neurological disease or thyroid disturbance which has not been previously identified as a cause [40]. Stress, anxiety and depression can also affect gut motility and function [5].

Asking about adverse life events can identify history of undisclosed abuse or trauma.

This can be one of the most difficult sequence of questions to ask. Questions pertaining to the previous and current mental health status are a good start and

then the therapist can ask if there have been any traumatic events either in childhood or adulthood [20]. The therapist can start by describing how stress and adversity can precipitate increase in colonic motility and ask the patient if they can think of any correlation between life events and the onset of symptoms [11]. Some patients may have undiagnosed eating disorders which have precipitated inadequate oral intake or laxative abuse. In a 2012 study, there was a high proportion of eating disorders present in the Biofeedback clinic although this was not mentioned in the referral letter or divulged by the patient until asked about general health or dietary intake [11].

8.12 Obstetric History

"How many babies have you had?"
"Were they big babies? Did you have any cuts (episitomy) or tears? Did they need to use instruments to help like forceps or venteuse? Were there stitches?"

Women who have had difficult deliveries are more at risk of incontinence due to sphincter disruption [21]. Obstetric trauma is the commonest cause of anal sphincter damage [36].Those who have sustained a third or fourth degree tear are most at risk of incontinence but other factors can include heavy babies of more than 4 kg, prolonged second stage of labour, use of instrumentation and obesity [21]. Asking the right questions about childbirth here, can indicate if the incontinence is due to sphincter damage.

8.13 Dietary and Fluid Intake Influences/Drinking/Smoking

"What do you eat for breakfast/ Lunch/Supper on an average day?"
"How much fluid do you drink? Do you drink tea? Coffee, alcohol? How much?"
"Do you smoke? If so, how many cigarettes a day?"

In this assessment we ask for a typical day food intake to identify any obvious precipitating factors to incontinence. There is very little research on which foods may make incontinence worse. Although a high fibre diet is recommended for a healthier lifestyle for the individual experiencing bowel control problems fibre can make these worse [31]. Reducing fibre could decrease gut motility, making the stool firmer and may reduce diarrhoea. Fluid intake is important for hydration; however caffeine, alcohol and diet drinks containing artificial sugars such as Sorbitol may increase bowel motility [37]. Nicotine in cigarettes can also cause a mass movement into the rectum [45]. As previously mentioned, these questions may reveal an eating disorder. This may not have been evident prior to the assessment and management of tis patient group requires appropriate knowledge and skill [38]. Discussion with the MDT and ongoing referral, where appropriate should be undertaken. The effect of diet on bowels is explored in more detail in Chap. 10.

8.14 Skin Problems

"Do you get sore around the vagina or back passage? Does it itch? Do you use any creams on this?"

Increase in bacteria and enzymes as a result of bowel or bladder incontinence can cause skin breakdown; excoriation and itching. Alkaline faeces can alter the slightly acidic PH of skin which will lead to irritation [2]. Urinary leakage similarly causes soreness and irritation.

Finding out which measures patients currently take to protect the skin and if these works can inform practice with regard to recommendations of barrier creams or use of containment products such as the Renew anal insert [19] (described in more detail in Chap. 9 on conservative management).

8.15 Bladder Symptoms

"Do you have any bladder problems such as leakage?"
"When does this happen?"
"Do you lose urine when you cough or sneeze?"
"Do you ever have difficulty holding your urine?"

Urinary incontinence is very prevalent with up to 12 % of the UK population affected [17].Assessing for urge and passive urinary incontinence indicates global pelvic floor function. Ideally, the pelvic floor should be considered and ongoing referral undertaken where bladder symptoms are prevalent.

8.16 Effects on Lifestyle/Relationships/Emotions/ Psychological Effect

"How does this problem make you feel?"
"Does the bowel problem stop you doing what you want to do and in what way?"
"How do you manage the incontinence?"

Faecal incontinence can have debilitating effects on the individuals physical, social and psychological functioning [30]. Patients may feel stigmatised and suffering from a loss of confidence. For some, the bowel problem is so debilitating that patients may develop a phobia due to increased anxiety. Finding out which measures patients currently use to manage the situation identifies adaptive behaviours. Some may work effectively, and extrapolating the specific strategies employed may indicate which conservative measures to try first.

8.17 Follow Up

Based upon the initial assessment a follow up assessment is used for subsequent Biofeedback sessions (see Fig. 8.2). This can monitor the progress of the patient with the recommendations made for treatment.

8.18 The Examination

Digital Rectal Examination (DRE) can be used as part of the assessment process [37].

Consent must be obtained prior to any examination [37]. A full explanation of the process is required to gain informed consent prior to the examination.

The DRE must not be undertaken without consent. Careful discussion within the MDT and consideration should be given to cases where there are cautions such as active inflammatory bowel disease, possibility of rectal mass, obvious rectal

Past Medical History:

Previous bowel treatments and effects:

Obs & Gynae:

Parity: ☐Gravida ☐ Para ☐ Difficult Deliveries:_____

Menstruation: _____ Menopausal State:_____ HRT:_____

Pregnant: ☐ Yes ☐ No ☐ Planning Result smear test:_____

Gynae surgery:_____

Sexually active:_____ Dysparunia:_____

Urinary & symptoms:

Stress incontinence _____

Urgency incontinence_____

Nocturia _____

Other: _____

Dietary influences:

Alcohol _____

Fizzy drinks/aspartame_____

Fluids (caffeine) _____ cups/mugs per day

Smoker? _____

Weight/Height/BMI = _____

Skin problems: ☐ Sore: _____ ☐ Pruritus: _____

☐ Excoriated:_____ ☐ Other: _____

Current skin care: _____

History Depression:_____

Effect on lifestyle/relationships/emotions:

On examination: Consent given for PR/PV examination ☐ Yes ☐ No

Fig. 8.2 Biofeedback review sheet continued

bleeding, recent radiotherapy to the pelvic area, a high spinal cord injury (due to the possibility of autonomic dysreflexia) recent anorectal surgery or a known history of abuse.

Digital Rectal Examination (DRE) is undertaken to assess a number of factors. It is performed with the patient in the left lateral position on the examination couch with the patient bringing their knees up to their chest.

A visual inspection of the anus and perineal/perianal area should be conducted prior to the examination, and any anomalies documented and reported.

The therapist should look for:
Prolapse – grade and ulceration
Haemorrhoids – external.
Skin Tags.
Anal fissure.
Wounds.
Lesions.
Fistula.
Sin conditions.
Pressure areas.
Blood.
Evidence of soiling.
Scarring.
Adapted from RCN Guidance on DRE [37].

After visual assessment as seen on the anorectal tool, lubrication is applied to a gloved index finger. A gentle insertion of the finger into the anus and lower rectum firstly includes a sweep around the circumference of the anus in order to assess for any abnormality.

The use of an anorectal assessment tool can guide the examination.

We use the anorectal tool which has been shown to have inter rater reliability in a study conducted in clinical practice [22] (see Fig. 8.3).

8.19 Resting Tone

Resting tone can be an indicator of internal sphincter function. Insertion of the gloved digit, to the trained therapist will show a level of resistance graded between 0 and 5.

The patient is then asked to bear down to assess for perineal descent which can indicate global pelvic floor weakness. A descent of more than 2 cm is defined as "excessive perineal descent" (Papa [35]).

The patient is then asked to cough to demonstrate if involuntary squeeze pressure is achieved. A normal involuntary contraction is indicative of a functioning sphincter and therefore may indicate that the patient cannot properly contract voluntarily due to incoordination or loss of muscle endurance resulting in fatigue.

8.20 Squeeze

Squeeze is an indicator of external sphincter and accessory muscle function. The fatigue rate of the external sphincter is an indicator because it should take 3 min for a sphincter to become fatigued and those with faecal incontinence have a much quicker fatigue rate [46]. Therefore, the ability to sustain a contraction is hypothesised to play an important part in continence. The involvement of the puborectalis is

Usual bowel pattern now:

Former bowel habit if changed:

Usual stool consistency:

1 lumps 2 Lumpy sausage 3 Cracked sausage 4 Soft smooth sausage
5 soft blobs 6 Fluffy, mushy 7 Watery, no pieces

Faecal incontinence: How often? _____ How much? _____

Consistency of incontinence: _____

Symptoms:

Urgency? Time can defer for: _____
Urge incontinence: ☐ Never ☐ Seldom ☐ Sometimes ☐ Frequently
Difficulty wiping: ☐ Yes ☐ No ☐ Sometimes
Post defaecation soiling: ☐ Yes ☐ No ☐ Sometimes How long for? _____
Passive soiling: ☐ Yes ☐ No ☐ Sometimes ☐ Events causing?
Amount of flatus: ☐ Normal ☐ Excessive ☐ Very excessive
Control of flatus: ☐ Good ☐ Variable ☐ Poor
Ability to distinguish stool/flatus? ☐ Yes ☐ No
Nocturnal bowel problems? ☐ Yes ☐ No
☐ Woken at night ☐ Leaks ☐ Evacuates

Evacuation difficulties? ☐ No ☐ Straining ☐ Incomplete evacuation
☐ Other: _____
Sensation of prolapse? ☐ Yes ☐ No
Rectal bleeding? ☐ Yes ☐ No If yes, describe: _____

Protection: ☐ No ☐ Tissue ☐ Pant liner ☐ Pad, No. per day: _____

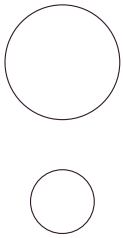
Bowel medication:
Current: _____
Tried before & effect: _____
_____

Other medication: _____
_____

Fig. 8.3 The Anorectal Assessment Tool

Resting tone	**Squeeze**
Scars: Skin tage: Haemorrhoids:	Puborectalis: **0 1 2 3 4 5** Maximal squeeze: **0 1 2 3 4 5**
Gaping: At rest With traction	Endurance (max squeeze): Repeats:
Resistance **0 1 2 3 4 5**	Sub-max endurance: Repeat x 2
Marked perineal descent: At rest Straining	Fast contraction: (Up to 10)
Cough reflex: Absent/weak, delayed/good	Co-ordination: Response: Accessory Muscles:

Trigger points:



Plan:

Next Appt:

Signature: Date:

Fig. 8.3 (continued)

important in controlling of the pelvic floor [26]. Repetitions of the squeezes are used to assess for fatigue of the muscle. A poor endurance squeeze can indicate loss of endurance when holding on to defer defaecation. General co-ordination of the external sphincter is demonstrated by response to verbal instruction from the therapist [44].

8.21 Evacuation

An anorectal balloon can be used to further explore defaecatory dynamics.

Balloon expulsion time allowed for patients has differed according to various studies. Since most normal subjects can expel the balloon within 1 min, recent studies provide that inability to expel the balloon within 1 min is suggestive of a defecatory disorder [27]. In this instance a defaecatory disorder, or inability to empty completely could account for incontinence.

The patient is asked to strain which will demonstrate if there is relaxation of the anal sphincter and propulsion. The correct techniques for evacuation can then be taught (using the Brace exercise which will be discussed in more detail in the chapter on conservative management).

The assessment provides comparative measures to monitor progress between appointments. It can show improvement in patients muscle control and defaecatory dynamics. The assessment can be repeated at every appointment and guide the clinician in assessing progress and advising on specific exercises and treatment. Exercises for strength are often given at the first appointment with more emphasis on endurance squeeze and fast twitch later on during treatment.

Conclusion

This chapter presented an assessment for faecal incontinence. This assessment can be used to plan individualised care for the patient and guide a systematic approach to treatment. A follow up assessment can be used at subsequent appointments to provide a systematic approach to introducing new interventions. This will be explored in more detail in the chapter on conservative management where treatment pathways are presented. Ultimately, a thorough and comprehensive initial assessment guides the treatment that will provide the best possible outcome for the individual patient.

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Part III

Treatments for Bowel Dysfunction

Conservative Management

9

Brigitte Collins and Elissa Bradshaw

9.1 Conservative Bowel Management

Various treatments are available to treat faecal incontinence and constipation. Conservative bowel management is generally first line treatment and includes dietary and fluid modification, lifestyle changes, medical management and biofeedback and/or physical therapy. Other chapters have discussed some of these conservative measures. It is therefore the intention of this chapter to focus on biofeedback therapy and in particular the treatment that is offered from the biofeedback therapy team in the Sir Alan Parks Physiology and Neuromodulation Unit at St. Marks Hospital. That is not to say this is the categorical treatment it is to demonstrate the actual techniques that works well for this unit.

9.1.1 History of Biofeedback Therapy for St. Marks Hospital

The biofeedback service commenced in 1986 when Dr. Michael Kamm recognised the need for a treatment to help bowel dysfunction namely constipation. He researched the subject and set up a service adopting measures and delivering techniques to improve such bowel problems. Unfortunately the measures he offered failed to improve patient's symptoms and he therefore enlisted the help of a Gastroenterologist who had many years of biofeedback experience. As a result Dr. Kamm modified his provision of treatment and began to see a significant difference in patient's symptoms, thus a biofeedback service for constipation was created.

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Because of Dr. Kamm's success, the biofeedback service continued expanding the team with a nurse and psychotherapist where roles were established as biofeedback therapists. Once established the service extended treatment to the symptoms of faecal incontinence, which was delivered by a nurse Christine Norton. The biofeedback service has progressed for 30 years and advanced through research and developing new treatments thus matured to a treatment addressing the physical and psychological needs of those with bowel dysfunction. This means that each patient is assessed and treated holistically taking in to consideration how quality of life can be impaired to what has become a real problem in the United Kingdom.

9.1.2 Evolution of Service

The current biofeedback service has itself expanded to 8 therapists including 1 x Lead Nurse, 2 x Clinical Nurse Specialists, 2 x Physiotherapists, 1 x Nurse in Training, 1 x Counsellor Specialist and 1 x Advanced Dietician. Each therapist's role has taken on their own subspecialties as follows. The aim of encompassing subspecialties is to broaden treatment further and to strive for a streamlined service, as well as improve patient outcomes with the concept that each person can continue to cope and manage with confidence.

9.1.3 Neuromodulation

Neuromodulation is usually offered when conservative management has failed to adequately improve symptoms of faecal incontinence for the individual. Two treatments are managed under the neuromodulation service the first being Percuatenous Tibial Nerve Stimulation (PTNS) and the second Sacral Nerve Stimulation (SNS). This is a dedicated nurse specialist service where PTNS is provided in the outpatient setting along with the reprogramming of SNS, which has been described in more detail in the neuromodulation chapter.

9.1.4 Hypnotherapy

If standard measures of conservative bowel management have shown no signs of improvement the patient has the option of hypnotherapy. The success of hypnotherapy has been demonstrated in Peter Whorwells Manchester Model and trials [1]. The National Institute of Clinical Excellence (NICE) [2] published evidence that hypnotherapy was a good effective irritable bowel syndrome (IBS) treatment and recommended its use. As a result this has now been introduced in the biofeedback service offering up to 12 sessions on a weekly basis and endeavours to address the common symptoms of abdominal pain and discomfort, diarrhoea, constipation, bloating, nausea, excess wind and indigestion.

9.1.5 Counsellor Specialist

The Counsellor Specialist role has been part of the biofeedback therapy team for 2 years and uses an integrative approach with patients providing positive reinforcement through a Psychodynamic-Psychotherapy approach. This is explained in more detail in Chap. 15.

9.1.6 Advanced Dietician for Fermentable Oligo-Di-Monosaccharides and Polyols (FODMAP) Diet

The strategy for this treatment is to ensure all other dietary methods have been addressed prior to undertaking the FODMAP diet (as described in Chap. 10). Patients are seen within the outpatient setting and usually 2–3 times with several weeks in between each appointment, giving the individual time to adopt and implement the recommended diet.

9.1.7 Adolescents

This service has been extended within the biofeedback therapy service in the last 12 months and accepts referrals for adolescents between the ages of fourteen and eighteen. Depending on the individual the therapist can work either with the family and the patient or independently with the patient. The consensus is to focus on behavioural techniques, diet and psychosocial/psychoeducation of bowel dysfunction. As a result this promotes the individual's ability to self manage their symptoms. Perhaps recognition at an earlier age may prevent symptoms intruding in to adulthood, a concept that can hopefully be explored in more detail with the development and experience of this service.

9.1.8 Urology

Bladder and bowel dysfunction often go hand in hand. As Kaplan et al. [3] in their systematic review point out bladder and bowel function are closely related and should be considered when treating patients with bowel symptoms, urinary symptoms or both. As a service urinary problems have often been considered albeit to a lesser degree. Having urology as a subspecialty suggests that patients can be managed in more of a streamlined way and as Kaplan et al. [3] conclude in their review the crossover between these two organs imply that a treatment for bowel dysfunction may affect the bladder and vice versa. It is the intention for the service to expand further in to urinary problems once experience has been established.

9.1.9 Psychosexual

Patients that present to the biofeedback service often experience difficulties with sexual health; this can be from surgery, pelvic pain, childbirth, cancer, abuse, menopause, body image, eating disorders and/or bowel dysfunction. By understanding

factors that contribute to poor sexual functioning in our patients we can strive to minimise adverse psychosocial events [4]. Whilst sexual dysfunction is not life threatening the impact on quality of life is significant. As a result the introduction of this subspecialty may be of immense therapeutic benefit.

9.2 Treatments Offered from the Biofeedback Pathways

9.2.1 Patient Education

An early and integral part of conservative bowel management remains the education of patients regarding their specific problem [5]. Developing an understanding of the digestive tract and the anatomy and physiology of the anorectum and pelvic floor, can greatly enhance the individuals compliance with treatment when the rationale for certain strategies are explained [6]. Some patients may have inaccurate understanding of their anatomy or have scoured the internet, found something that appears to be pertinent and become very concerned [7]. The education of patients even in terms of understanding that they don't need to have a daily bowel movement can be a revelation. Results of investigations can be explained and radiographic images shown to patients which we find extremely helpful when explaining transit studies, proctographic results and endoanal ultrasound scans [8].

9.2.2 Bowel and Muscle Retraining

9.2.3 Evacuation Techniques

Evacuatory difficulty can be both distressing and debilitating for patients [9]. The inability to initiate or complete defaecation can have various causes. In the absence of a structural abnormality it may be caused by failure of the anus to relax (anismus) or poor co-ordination between rectal contraction, abdominal effort and anal relaxation (dyssynergic defaecation) ([10], [11]). There may also be a structural problem of stool trapping caused by a weak pelvic floor, bulging of the anterior rectal wall (known as a rectocele) or rectal intussusception (where the bowel telescopes in on itself) or where part of the bowel lining falls down into the lower rectum or anal canal (mucosal prolapse). These problems can lead to a need to strain excessively or use digitation to empty. Failure to empty may also lead to passive loss of stool (post defaecation soiling). Regardless of the causes or causes, an effective treatment for emptying includes use of evacuatory techniques (namely the brace exercise and appropriate breathing techniques) and positioning. The best position to promote emptying is by emulating a squat on the toilet. This straightens the anorectal junction, allowing relaxation of the puborectalis and offers a gravitational and

anatomical advantage (see Fig. 9.1) [10]. This extremely simple measure can be very beneficial.

9.2.3.1 Brace Exercise

The patient is advised to adopt the evacuation position and bulge out the lower abdomen. This is a way to locate the deep oblique abdominal muscles which can be used to create appropriate intra-abdominal pressure. Whilst keeping the abdomen bulged out, the patient should push down towards the anus, relaxing for a second (keeping the abdomen bulged but not pushing) and repeat several times. The

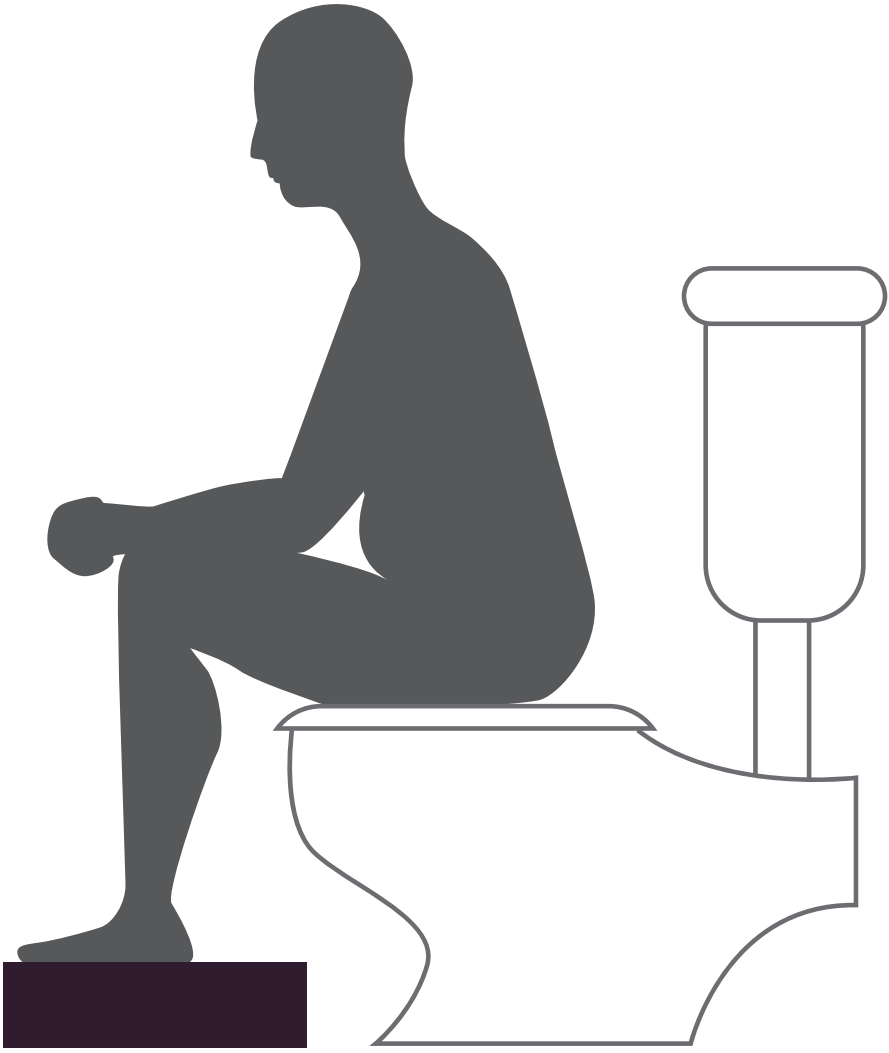

Fig. 9.1 Evacuation position

exercise takes time and practice and patients are advised to use this technique (30–45 min after eating), on the toilet following a meal, once a day in order to promote a gastro colic response. Even if an urge is not felt patients are encouraged to use this technique for up to 10 min at a time on the toilet. Regular practice of this technique can help to regulate or normalise the bowel function (see Fig. 9.2)

9.2.3.2 Balloon Expulsion

The patients ability to expel a rectal balloon can be used as a diagnostic test for defaecatory disorders but should be used in conjunction with other tests such as defaecating proctogram [12] Biofeedback therapists are able to assess bowel co-ordination by inserting a deflated balloon into the rectum and inflating the balloon

Brace exercise

Your bowels are part of your body and you need to take control of them. This may seem difficult at times, especially when you feel under stress. The following routine will help you to regain control.

Every day set aside approximately 10 minutes for this so you are not reshed.
(Preferably half an hour after breakfast). It is important that you are not interrupted.

1. CHECK YOUR SITTING POSITION ON THE TOILET

Lean forward with your forearms resting on your thighs and your feet raised on a small block (like a toddler step). Relax and lower your shoulders.

2. RELAX

Breathe slowly and gently.
Try to let go with all of your muscles.

3. NOW TRY TO OPEN YOUR BOWELS

Remember NOT to hold your breath ie: do not take a big breath in first.

a) **Slowly** brace outwards (widen your waist). When fully braced push/propel from your waist **back** and **downwards** into your back passage at an angle

DO NOT STRAIN

b) Relax for one second but only very slightly. You must maintain a level of pressure with your brace,whilst not pushing with it.

c) Brace outwards and push downwards again. This should be repeated.

You should be using your brace as a pump.

Remember, this takes time and practice.

Fig. 9.2 Brace exercise leaflet

typically with 50 ml (or until the patient feels the urge to defaecate) of air via a luer lock syringe (see Fig. 9.3)

This provides the sensation of a full rectum and the need to defaecate. This is performed whilst the patient is in the left lateral position. The therapist monitors patients' abdominal movements, relaxation and breathing during the attempt to expel the balloon [13]. The pelvic floor can be observed for excessive pelvic floor descent. Many patients demonstrate defaecatory incoordination. This can include poor propulsion or paradoxical contraction [13]. The balloon can be used to teach the brace exercise by describing the use of intra-abdominal pressure and propulsive effort and then trying to expel the balloon. Patients may often exhibit holding their breath, pulling in their lower abdomen and /or pulling up the sphincter instead of relaxing it and the balloon provides a way of re-educating the patient to use correct defaecatory dynamics

9.2.3.3 Urge Resistance

The rectal balloon may also be used in urge resistance training for patients with urge faecal incontinence. The balloon is inserted and air introduced until the patient feels an urge to defaecate. The patient will note that within a short time the sensation will pass. More air will be passed in to the balloon until the urge is to the maximum volume that the patient can tolerate. This will help to educate patients regarding urge resistance where they can transfer skills obtained in the clinic to any given situation. If the stool is formed the urge will dissipate, demonstrating the patients will be able to defer defaecation [9].

9.2.3.4 Sphincter and Pelvic Floor Exercises

Pelvic floor muscle exercises have been found to significantly reduce anal incontinence [14]. There is no current consensus on the best way to teach these [15]. The muscles of the pelvic floor are like other muscles that are voluntarily controlled within the body. Regular exercises will tone and increase muscle fibres [48]. Both pelvic muscle exercises and biofeedback improve FI symptoms by improving contraction of pelvic floor muscles, sensory-motor coordination required for continence, and enhancing the ability to perceive rectal distension [16] advocate exercises for the sphincter (see Fig. 9.4)

Pelvic floor exercises for the vaginal muscles may also be beneficial and we do aim to teach both within our treatment pathways at St. Marks. Pelvic floor exercises are established according to the individual's ability and a programme set for the exercises to be practised at home, which can then be checked at the next follow up appointment.

Fig. 9.3 Anorectal assessment balloon

Sphincter exercises

Starting the Exercises

Imagine that you are training to run in a long distance race. You will need regular exercise built up over a long period of time to get the muscles in the legs strong enough to complete the race. If you want to continue running in races you will have to maintain an exercise program to keep fit. Exercising the anal sphincter muscles is the same as exercising any other muscles in the body- it takes time to reach maximum fitness and ongoing exercise to maintain it. From time to time your exercise program may have to be checked to make sure it is correct for you.

Over one-third of women start out their exercise programs squeezing the wrong muscles. Most people find it easy to isolate and contract the "Popeye" muscle in the upper arm, the biceps. It's almost as easy to isolate and contract the anal sphincter muscles. Sit comfortably on a chair with your knees slightly apart. Imagine that you have severe diarrhoea and squeeze the muscles around your back passage in an attempt to hold this back. Make sure you are not holding your breath when tightening the anal muscles.

If you are still unsure which muscle you are squeezing you can put a finger on the anus. You should feel a gentle lift and squeeze with a puckering of the skin at the anal margin. The buttocks, tummy and legs should not move much at all.

The Exercise Program

The exercises can be performed when sitting, standing or lying. The knees should be slightly apart. Try the following routine:

1. Squeeze and pull up the anal muscle as tightly as possible and hold the squeeze for 5 seconds. Relax for at least 10 seconds. Repeat this at least 5 times.
2. Now, squeeze and pull up the muscles to about half of their strength. See how long you can hold for then relax for at least 10 seconds. Repeat this at least 5 times.
3. Lastly squeeze and pull up quickly and relax again without holding 5 times. Do this quick squeeze/relax routine as fast as possible.

With time your ability to hold the squeeze (endurance) should improve and you can try to hold for 10 seconds, 20 seconds or even longer. You should also be able to increase the number of quick squeezes that you can do.

When Should I Expect Improvement In My Symptoms?

It takes from six to twelve weeks for most women to notice a change in bowel control.

How Should I do The Exercises?

At first you should do these exercises many time a day - 10 times if you can. When your muscles are strong again five minute sessions done twice a day should be adequate. Do them while watching television or on the telephone. Many woman report that five minutes before they get up in the morning and five minutes before sleep is a help routine.

Helpful Hints

- At first you will have to make a conscious affort to put time aside each day to do you exercises Eith time they will become part of your daily routine
- Watch your weight - extra weight puts extra strain on your muscles
- Persist with the exercises and have faith in them. Remember, they are risk-free and painless

Fig. 9.4 Sphincter exercises need

Some women may find the execution of pelvic floor exercises difficult and uncertain as to whether they are doing them correctly. As a result we can provide the following to assist.

Pelvic Floor Educator

A device that acts as a visual aid to show if the pelvic floor is contracting the way it should. The indicator wand is attached to the body of the educator and inserted in to the vagina. Once inserted pelvic floor exercises can begin and as the muscles contract the educator will follow the internal walls of the vagina, thus giving an indication of correct technique (see Fig. 9.5)

Fig. 9.5 Pelvic floor educator

9.3 Neuromuscular Stimulation

Some evidence points to the fact that biofeedback and electrical stimulation may enhance the outcome of treatment compared to electrical stimulation alone or exercises alone [16]. This is a logical conclusion given that neuromuscular stimulation has helped those with anterior pelvic floor dysfunction in terms of bladder function [17]. Electrical stimulation and/or anal biofeedback may be superior to vaginal biofeedback in women with symptoms after childbirth [18]. However, very limited evidence means that any conclusions drawn from current research are at best tentative [16]. In our experience neuromuscular stimulation can be very helpful to patients augmenting the results of their home exercises and improving their sensation and we utilise a neurotrac stimulator with anal or vaginal probe for this (See Fig. 9.6)

Electrostimulation is used to provide enhanced awareness of the pelvic floor muscles. Patients feel the electrical involuntary muscle contraction, and this can assist in learning how to contract muscles actively [19] Electrotherapy should involve a frequency of 40–50 Hz, impulses lasting 5 sec, and 5 sec pauses for approximately 20 min [19].

9.4 Biofeedback Therapy

The term "Biofeedback" has historically been used to describe the use of specialist machines for bowel retraining. The aim of biofeedback in its various guises is to restore normal defaecation for both constipation and incontinence

Fig. 9.6 Neuromuscular stimulation need

using the muscles used in defaecation (abdomen, rectum and pelvic floor). Biofeedback is performed using a variety of visual, auditory, or verbal feedback techniques with a probe inserted into the anorectum to display pressure changes [20]. There is no internationally accepted definition of what Biofeedback should include [16]. In machine led Biofeedback a manometric probe is placed by the therapist into the patient's rectum. This elicits rectal and anal pressure readings on a computer screen for the patient to observe. This visual aid gives "feedback" on muscular action and co-ordination. Patients can be taught to coordinate their abdominal propulsive effort showing a rise in intra-rectal pressure and synchronized relaxation of the anal sphincter depicted by decreased anal pressure on the monitor.

A balloon in the rectum can also be distended with 60 cc of air to provide the patient a sensation of rectal fullness or the desire to defecate. Patients are asked to attempt defecation while observing the pressure changes in the monitor [13].

It is proposed that up to 50 % of patients with dyssynergic defecation have impaired rectal sensation, and therefore this suggests that rectal sensory training is also beneficial. The goal of this training is to improve sensory perception to improve awareness for emptying. This is accomplished by repeated inflations and deflations of the rectal balloon, establishing newer thresholds for rectal perceptions in the process [21]. Some large studies have shown that use of machine Biofeedback is essential in addressing evacuatory dysfunction [13].

Use of a pressure measuring probe can be used as a useful visual aid to assist in patient retraining their pelvic floor muscles. It involves the placement of a pressure sensor into the anal canal. The Biofeedback asks the patient to undertake voluntary

contraction of the anal sphincter, and the patient can watch the movement on the screen. With newer high resolution technology this provides an impressive visual aid to bowel retraining.

There is a dearth of robust randomised control trials but we know from our experience that we maintain a high satisfaction rate regardless of if machine Biofeedback with treatment which again points to the importance of the clinician patient relationship as opposed to the specific measures used for treatment. Perhaps the important point, given the dearth of studies is that "Biofeedback" and all that this may encompass between different centres, is unlikely to cause any adversity of harm. The current care packages of "Biofeedback" despite variance, remain the mainstay of conservative management.

9.5 Emotional Support

The therapist patient relationship is pivotal to the success of treatment. Our experiences and patient audit have shown that the support obtained has greatly helped patients and augmented compliance with the treatment. It is not uncommon to experience very emotional consultations where patients divulge details they have never discussed with another person [22]. Patients discussing the specificity of the problem, or making a connection with when or why the bowel problem started, may become very emotional [23]. We have weekly supervision to allow each therapist, within group supervision, to discuss troubling or difficult situations that we have experienced in clinic [24]. This helps with any transference or counter transference, which is a particular challenge of the role [25]. Often, one cannot fully empathise without experiencing some emotional burden and with experience and supervision these can be discussed, accepted and used as experiential learning [24, 49]. This was also found to enhance role satisfaction for the team [24]. If we feel patients require additional support beyond our scope of practice, we can refer them to our specialist biofeedback counsellor or to our psychiatrist.

9.6 Basic Dietary Advice

The patient may report that they have very obvious dietary triggers that exacerbate functional bowel symptoms. For example, diets high in artificial sugars and caffeine, or low in fibre can reduce stool consistency while increasing episodes of stool loss and leakage for some patients [26]. The therapist may wish to recommend a lower fibre diet in the first instance for both constipated and incontinent patients (particularly if they suspect overflow incontinence to hard or pellet stools). Conversely, for some constipated patients, fibre intake may lead to abdominal distension, discomfort and worsening constipation [27]. Either increasing or reducing fibres may be beneficial for those with constipation and incontinence and hinges on the initial assessment. Some patients have already tried a very high fibre diet prior to attending clinic to no avail. The idea of a low fibre diet can feel extremely

counter intuitive given that lack of dietary fibre has been historically attributed as a source of many ailments [28]. However, based on our experience it is a good starting point to try reduction of insoluble fibres for all functional bowel patients for a period of 4–6 weeks prior to a follow up appointment and to monitor the effect. Our work with a specialist dietician allows us to refer on for more specialist input should it be required.

9.7 Basic Pharmacotherapy

Many medications affect bowel motility [29]. Starting new medications can precipitate looser stool or constipation and its worth remembering that many of the very commonly prescribed drugs such as analgesics, Non-steroidal, anti inflammatories, Statins and Serotonin reuptake inhibitors (SSRI anti-depressants) can cause diarrhoea or constipation (NHS choices 2016). Patients may use herbal remedies or supplements bought over the counter may induce diarrhoea and these should be stopped during treatment. The advent of weight loss drugs has led to many referrals for faecal leakage which have disappeared when the patient is advised to stop taking them. Although seemingly obvious given the mode of action of fat binding drugs this may only become apparent during a very detailed assessment. Simply reducing medications that have a diarrheal adverse effect or that increase intestinal transit may result in significant improvement in faecal incontinence [26].

9.8 Lifestyle Modifications

Certain lifestyle modifications in promoting bowel health may be implemented. Simple health promotion advice can significantly improve functional bowel symptoms in our experience. The effect of acute and chronic stress on bowel function is acknowledged, if not fully understood [30, 31]. Finding ways to alleviate stress may be recommended and may include relaxation, breathing techniques and meditation [32]. Smoking has been described as having an effect on the gut. In some, it is known to increase motility within the distal colon, which can exacerbate bowel incontinence. A recent study showed that it can also cause functional constipation and bloating [50]. Advising smoking cessation is a positive first step in terms of regulating bowel function. Weight loss may improve both constipation and incontinence. Although the pathophysiology may not be completely understood in bowels, urinary incontinence is distinctly improved by weight loss [33]. One theory about the positive effect of weight loss is not just the alleviation of weight on the pelvic floor but also normalisation of eating behaviour, regulating gut hormone levels and potentiating regulated gastrointestinal motility [32].

9.9 Laxative Cessation

Historically the mainstay of Biofeedback in the management of constipation involved cessation of laxatives [34]. Glycerine suppositories were to be used as a rescue remedy every 3–4 days. It is important for patients to understand that the stool consistency will change without laxatives but bowel retraining often involves allowing the bowel to normalise. Often patients will feel worse before they get better but with the taught techniques they can attain an acceptable bowel pattern without the use of medication. Throughout the evolution of the service and the increasing co-morbidities of the patients we have had to be flexible in our approaches. For example we may not deem it appropriate to suggest complete laxative cessation in those with concomitant neurological conditions. The recommendations will depend on the individual assessment. Contrary to earlier studies stimulant laxatives do not appear to damage the enteric nervous system [35]. We have formulated pathways for guidance in management of chronic constipation but the course of treatment will often rely on the skill and experience of the therapist and discussion within the team. There are no absolutes within the field of Biofeedback at St. Marks. Instead the therapist aims to create a symbiosis with the patient, ascertaining the patients' individual goals for treatment and working within the parameters of the discipline. The follow up appointment allows the therapist to monitor the results of treatment and the therapist has to be open and adaptable. Increasingly in current practice the individual Biofeedback therapist is a hybrid practitioner [36]. What seems to be the most important factor, is the relationship between the therapist and the patient [37]. We are fortunate to have a large team with whom to discuss individual cases for ideas, support and ongoing referrals to allied professionals such as the Biofeedback Dietician or Counsellor.

9.10 Neuromodulation

As previously discussed in the chapter on Neuromodulation, neuromodulation has now become one of the adjuncts offered within the Biofeedback Service for faecal incontinence. Percutaneous Tibial Nerve Stimulation (PTNS) is offered when other conservative measures have failed and some studies show this is effective in up to two thirds of patients [25]. One study pointed to no difference between the sham group and those undergoing PTNS but the evidence does point to the fact that certain symptoms may respond better to this treatment and we continue to undertake it whilst auditing our own work [51]. If PTNS has failed patients will be discussed at the pelvic floor MDT and a discussion occurs to ascertain if the patient is eligible for a trial of Sacral Nerve Stimulation (SNS) [2].

9.11 Myofascial Release

In patients experiencing chronic pelvic pain symptoms may arise as a direct result of trauma to the muscles. In women this can occur from obstetric injury or trauma, and in both men and women may relate to accidental traumatic injuries, postural problems, or physical or sexual abuse [38]. Myofascial trigger points are often palpable within the pelvic floor and feel like lumps in the muscles or associated connective tissue [38]. Active myofascial trigger release points produce local or referred pain, while latent myofascial trigger release points will not trigger symptoms unless activated by an exacerbating physical, emotional, or other associated stressor [39]. Myofascial trigger points can develop in any of the pelvic floor muscles, and these trigger points usually refer sensation or pain to adjacent sites. The pain is often reproduced when the muscle is compressed or stretched. Active myofascial trigger release points are often found within a taut band in the muscle and typically refer pain when palpated. In levator ani syndrome (LAS) and unspecified anorectal pain the pain lasts more than 30 min, but in LAS there is puborectalis tenderness [11]. Trigger points may be felt within the pelvic floor and released over an intensive treatment of weekly or more frequent appointments. The muscles are palpated, stretched and released. Patients are also taught home exercises for accessory muscles dependant on the specific site of the pain. Training for this technique should be taught by a specialist physiotherapist and we have received training on this technique and vaginal examination from pelvic floor physiotherapist.

9.12 Rectal Suppositories and Irrigation

Rectal aperients such as suppositories , enemas or water for irrigation via devices such as the Qufora mini provide effective rectal clearance for many [10]. Glycerol suppositories can be used as a treatment for evacuatory dysfunction, constipation and faecal incontinence because stimulating rectal clearance may prevent incontinence [40]. If the rectum is empty then leakage is less likely to occur post defaecation for some patients. Suppositories have a mild stimulant affect when they come into contact with rectal mucousa creating rectal clearance (BNF, 2016). Bisocodyl suppositories have a similar stimulant affect but some patients find them more irritant than Glycerine [41] Most recently we have started to look at the effects of Lecicarbon, a carbon dioxide suppository, but evidence thus far is limited. If suppositories are used, we aim to capitalise on the gastro colic response by asking patients to use them 30–45 after a main meal, often breakfast.

The use of irrigation provides a way of managing rectal clearance without oral intake of laxatives and systemic effects such as abdominal cramp, wind and bloating. It can be used as a treatment for both chronic constipation and incontinence.

9.12.1 Specific Areas of Bowel Management

9.12.1.1 Rectocele

Defaecation may be rendered more effective with correct defaecation techniques which expedite ano-rectal coordination (see evacuation technique and posture), and perineal splinting (digitation) to compensate for excessive perineal descent. This may be carried out per vagina using a thumb to support the posterior vaginal wall, or by applying firm pressure on the perineum up and backwards. This has the effect of flattening out the herniation which allows emptying to proceed.

Pelvic floor muscle training will aid support and coordination and may reduce perineal descent, thus facilitating defaecation (see pelvic floor exercises exercises).

9.12.1.2 Rectal Prolapse

A complete rectal prolapse usually requires surgery. Such patients should be discussed in the Multidisciplinary team meeting and referred for surgical opinion. Sometimes a proctogram (see in investigations) is needed to define the extent of a rectal prolapse.

The following treatment options may be beneficial for mucosal prolapse, or to retrain the patient not to strain before **AND** after surgery, to avoid recurrence.

Evacuation techniques and positioning as above.

Behavioural Therapy

The patient with a rectal prolapse may get a 'false message' that they need to open their bowels. This is because of a 'heavy' feeling in the back passage. Repeated attempts to open the bowels results in excessive straining. Excessive straining may exacerbate the prolapse. In order to break this cycle, the following strategies are used:

- Attempt to open bowels a maximum number of three times a day (after meals), with the optimum being only once daily.
- Use of distraction by the patient to achieve the above.
- Avoiding attempting to open the bowels when passing urine.
- Limit time spent in toilet to 10 min.

9.12.2 Megarectum

The aim of treatment is firstly to empty the rectum and then to produce a porridge like stool to prevent faecal impaction occurring again.

- Initially the rectum is emptied using Phosphate enemas twice a day.
- Alternatively Movicol (polyethylene glycol) 8 sachets dissolved in 1 litre of water.
- In some cases it is necessary to perform manual removal of stool from the rectum under general anaesthetic.

- Once the rectum is empty laxatives are started
- Epsom Salts (magnesium sulphate) 40 mls, twice a day.
- Alternatively Movicol sachets 1–3 a day.

9.12.2.1 Behavioural Therapy

- Optimum positioning on the toilet is demonstrated (link here to Brace Pump)
- Learning effective evacuation techniques
- Habit training – attempt to open bowels half an hour after meals.
- Adjust doses of Epsom Salts or Movicol to achieve a bowel movement 2–3 times a day.
- Suppositories or enemas may be needed to aid evacuation.
- A good fluid intake should be encouraged (2 litres daily).
- Follow-up appointments – after 1 month, 3 months and at 1 year.

When the patient achieves a regular evacuation with their bowel routine it is advisable to try to reduce the amount of laxatives gradually, as some patients can achieve a spontaneous and regular bowel action with biofeedback.

It is important to discuss with patients that some active management will be necessary lifelong.

9.12.3 Solitary Rectal Ulcer Syndrome (SRUS)

9.12.3.1 Treatment and Management

Evacuation technique and posture as above.

9.12.3.2 Behavioural Therapy

The patient with SRUS often has a feeling of incomplete evacuation. This may cause the patient to strain in order to relieve the feeling. Straining will increase the feeling of incomplete evacuation causing a cycle to develop. The breaking of this cycle can be achieved by:

- Stop digitating
- Learning effective evacuation techniques – brace and pump exercise, or ‘lift’ exercise.
- Using this exercise to prevent the need to digitate rectally.
- Learning urge resistance techniques.
- Setting a goal of only attempting to defaecate a maximum of three times a day after meals (with the optimum being once a day).
- Using distraction techniques to achieve the above.
- Limit time spent in the toilet to 10 min maximum at each visit
- Gradually reduce the amount of caffeine in the diet to reduce stimulation of digestive system.

The role of the therapist is to facilitate change in the patient's behaviour and follow this difficult therapy. Some time is spent at each session discussing other life factors that may play a part in the patient's bowel problem. The patient is encouraged to introduce relaxing activities into their life.

Biofeedback is recommended as first line management for SRUS and the specialist is ideally placed to assess the patient's physical and psychological situation [42].

9.12.4 Irritable Bowel Syndrome (IBS)

IBS Treatment and Management may be helped by any of the following.

Dietary and Lifestyle Advice The patient should try regular meals avoiding long gaps between eating, this may help with symptoms of bloating and abdominal pain. Avoidance of specific foods is recommended on an individual basis. More information can be found in NICE Guidelines 2008. People with IBS who choose to try probiotics should be advised to take the product for at least 4 weeks while monitoring the effect. Probiotics should be taken at the dose recommended by the manufacturer.

Pharmacological Therapy Pharmacological treatment is based on the nature and severity of symptoms. The following should be considered. In constipation laxatives should be discontinued at the first biofeedback appointment. Patients are advised that some laxatives can cause bloating and abdominal pain. Initially, the patient may use a glycerine suppository if they have no bowel movement for 3–5 days, according to premorbid habit. Loperamide is considered the first antimotility agent of choice for patients with loose stools and should be titrated according to the patients needs. Antispasmodics can be recommended. Tricyclic antidepressants (TCA's) (Amitriptyline) can be recommended for the analgesic effect [43] and commenced at a low dose of 5–10 mg. SSRI's can be considered if TCA's have been ineffective. [2]

Bowel and Muscle Retraining The patient needs to establish a bowel routine to help reduce the swing from constipation to sudden diarrhoea. Having assessed the patient, a suitable exercise plan is devised with the patient to be practised every day (i.e.: co-ordinate muscles for defaecation; encourage 'holding on').

The patient should try to limit bowel actions to three times per day after meals when they have diarrhoea. Attempting to open bowels frequently may increase feeling of needing to go; aggravate the colon; increase pain and bloating. Symptoms of urgency may be exacerbated by excessive toilet visits/attempts to defaecate.

Patients should be helped to make changes in their lifestyle to help them relax and reduce stress.

Psychological Interventions Referral for psychological interventions (cognitive behavioural therapy, hypnotherapy, and/or psychological therapy) can be considered and are thought to be safe, effective and long lasting ([43]; [2]). A combination of an antidepressant and psychological treatment are thought to be useful in helping patients cope with their symptoms [43].

9.12.5 Other Products

9.12.5.1 Femmeze

The femmeze pelvic organ prolapse trainer is an ideal device for rectoceles which eliminates the need for vaginal digitations. It is a reusable product that helps to realign the rectum for passing stool but pushing the posterior wall of the vagina into alignment (see Fig. 9.7)

9.12.5.2 Anal Plug

Coloplast anal plug is a simple safe and discreet aid to prevent faecal incontinence. See Fig. 9.8.

The device is available in two sizes and can be worn for up to 12 h. It is usual for the smaller of the plugs to trialled initially and should there still be leakage then the larger size is recommended, although this very much depends on the individual. The plug prior to using and on removal from its packaging has the shape and look of a suppository. This expands once lubricated and inserted in to the upper part of the anal canal, ensuring that the string is left on the outside. The plug can be particularly uncomfortable if only inserted in to the lower part of the anal canal. It is therefore fundamental to make sure patients understand the anatomy and have a full explanation on its use. Removal requires pulling on the well attached string and wrapping

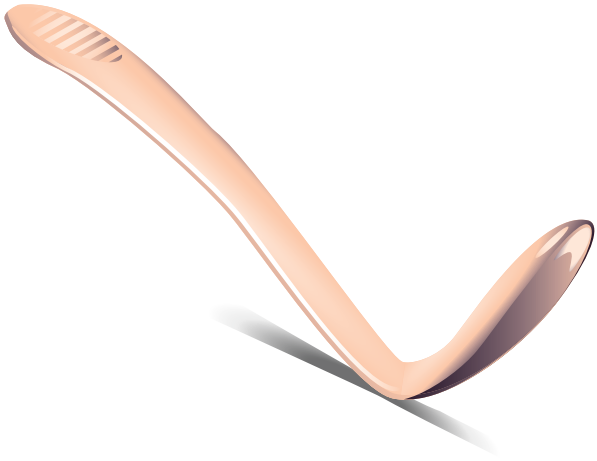

Fig. 9.7 Femmeze (Used with kind permission of Femmeze)

Fig. 9.8 Coloplast anal plug need (Used with kind permission of Coloplast)

prior to disposing of in normal waste if a sanitary bin is not available, as the product is non-flushable. Norton and Kamm [44] in their study found that there was a high failure rate in its use when comparing the two sizes. Herbert [45] was experiencing the same problems as the Norton and Kamm [44] study and found trying the plug within the clinical environment reassured the patient with an increase in uptake and success. There is also some thought that this device is endured better for those lacking in sensation such as spinal cord injury.

9.12.5.3 Re new Insert

Renew Inserts aid prevention of accidental bowel leakage. Figure 9.9. (Used with kind permission of Renew).

The product is made from a soft flexible silicone in regular or a large size that adapts to the body for a comfortable fit with an added applicator to enable ease of insertion, which is discarded once in place. The insert can be removed or expelled with the next bowel movement and worn for up to 12 h (see Fig. 9.9)

9.12.6 Odour Control

9.12.6.1 Shreddies Underwear

Shreddies are flatulence filtering garments and an ideal way of treating flatulence. The garments feature an activated carbon lining that absorbs all flatulence odours which then become trapped and neutralised by the cloth which is then reactivated after washing. The fabric remains effective for the life of the garment which is usually about 2–3 years. The garments can be obtained from www.myshreddies.com

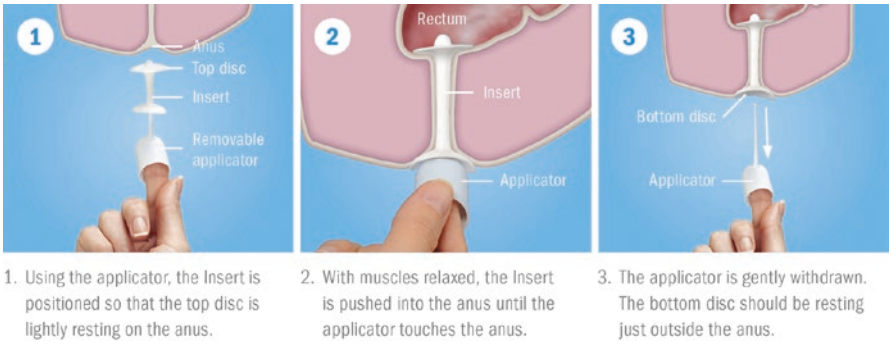

Fig. 9.9 Renew anal insert

9.12.6.2 Neutralisers

Small sprays can be used to neutralise odours and can easily be carried in pockets or handbags. Those used by ostomists provide an effective way of banishing smells and many find these can be used to banish unwanted odours related to flatus or faecal incontinence.

9.12.6.3 Skin Care

Faecal incontinence is known to be a factor to skin break down. Barrier aids can be effective aids in promoting skin integrity [46]. Ripley [46] points out that skin products of petroleum based ointments effect the absorbency of pads, and a reduction in absorbency increases the risk of excoriation [47]. However, an alcohol free barrier cream such as the Cavilon No Sting Barrier Cream has minimal effect on pad absorbency [46]. Cavilon creates an invisible barrier and protects the skin from faecal incontinence. Skin can remain protected as the cream is resistant to being washed off from a shower or bath, thus protection can last all day.

9.12.6.4 Cleaning

Wet flushable toilet wipes are a recent and helpful advent. Now sold in most super markets they can facilitate cleaning post defaecation and are conveniently flushable. We suggest those without alcohol to protect perianal skin. For patients with pruritis ani we often suggest use of Hydromol cleansing ointment or cream (BNF, 2016). This gentle emoillient actions soothes and hydrates skin, often helpful for those with soreness and itching and rarely cause sensitisation of skin (BNF, 2016).

9.12.6.5 Radar Key

The RADAR key scheme or national key scheme offers people access to locked disabled toilets around the country which can be found in a variety of locations. Access to these toilets provides cleaning facilities within the toilet. Keys can be obtained from Disability Rights UK who has also published a guide listing disabled toilets within each specific area. RADAR themselves have a guide to location of toilets that is updated each year and a list of toilets that use the key scheme.

9.12.6.6 Just Can't Wait Card

Some patients find that they become anxious of possibly needing a toilet when going out or on trips. The Bladder and Bowel Foundation and the IBS Network provide a 'Just can't wait card' which can be used to help gain access to a toilet when it is needed the most. As the Foundation and the IBS Network point out 'it does not guarantee access to toilets but does show that the individual has a genuine medical condition that requires the urgent use of the toilet.' However the IBS Network do highlight that 'cards are widely accepted and acknowledged.' Cards are the size of a credit card and can easily slot in to a wallet or purse.

Conclusion

The notion is that no one treatment will fit everybody. Adding further treatments to the service pathway not only offers support and addresses bowel dysfunction holistically but also ensures that each patient has a improved chance of improving their symptoms and quality of life with a streamlined service.

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Food Choice as a Management Strategy in Bowel Dysfunction

10

Diane Brundrett

10.1 Introduction

Whatever your profession when seeing patients with irritable bowel syndrome or other bowel dysfunction the possibility of food as a trigger of abdominal symptoms is frequently raised as a concern. The association of food ingestion with the induction of gastro-intestinal manifestations is widely accepted with 50–60 % of IBS patients reporting postprandial exacerbation of symptoms [21, 31]. This is significantly higher than the general population where the prevalence is reported at 20–25 % [39]. In a population based study where the dietary consumption of specific food items and nutrients between individuals with functional bowel disorders and healthy controls was compared, no difference was recorded in the intake of culprit foods (wheat, lactose, caffeine, fructose and alcohol). These results suggest that symptoms are due to food sensitivity or intolerance rather than altered diet composition [28].

Many take action in accordance with these perceived food intolerances and the patient with IBS is open to a myriad of dietary information, which can be both confusing and conflicting. Common diagnostic tests are of little value. Dietary manipulation is a major method that women use to influence their symptoms [15]. Self-reported food intolerances are associated with higher symptom severity scores and reduced quality of life [2]. Food related gastro-intestinal problems are more frequent in those with anxiety [31]. The foods most commonly implicated as causing symptoms are wheat, milk, fructose, caffeine, certain meats, fatty foods, alcohol, spices, dairy products and grains [13, 22, 31, 38]. However food is a complex mix of nutrients which are all potentially able to induce symptoms by several mechanisms.

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Three pathogenic mechanisms by which food might induce symptoms in functional bowel disorders have been proposed:

- immune activation (food hypersensitivity)
- direct action of bioactive molecules (food chemicals)
- luminal distension [9].

There is debate over whether immunological mechanisms are involved in IBS. It has been suggested that epithelial barrier permeability leads to immune activation and low grade inflammation and this may be important in the pathogenesis of IBS. Food antigens could cause low grade inflammation that would change the motor and sensory function of the gut in susceptible individuals.

Food is a source of stimuli for the enteric nervous system (ENS). If the specific bioactive ingredients in food can be identified that stimulate the ENS then this would allow dietary modifications to manage symptoms.

The presence of food in the gut and the gas produced by bacterial fermentation will induce luminal distension. Most patients with functional bowel disorders have a change in the relationship between stimulus intensity and perception, known as visceral hypersensitivity, resulting in a lower painful threshold of gut wall distension.

The consequences of perceived food intolerances and self-imposed dietary restrictions are less well known. In one study, 62 % of the population with IBS limited or excluded one or more food items from their diet (mean 2.5) and 12 % had made changes to their diet to such an extent that damage to health was judged as possible [20]. IBS alone does not affect nutritional status but if food restrictions are self-imposed, without healthcare advice being sought, the risk of nutritional inadequacy may increase.

10.2 Diet as a Management Strategy

Patients with IBS need information that explains the importance of self-help in effectively managing their IBS. This should include information on general lifestyle, physical activity, diet and symptom targeted medication [6]. Although the majority of patients attending gastroenterology clinics view diet as playing an important role in their condition and are interested in receiving dietary advice, few expect to receive it [1]. If a patient is identified as being interested and motivated to trial dietary management of their irritable bowel symptoms then referral to a registered dietitian should be pursued. Where there is a concern that a patient has instigated a number of self-imposed dietary restrictions which have led to an unbalanced eating pattern, referral to a dietitian will be beneficial as they will be able to advise on how to correct any nutritional concerns.

10.3 The Dietetic Consultation

A dietetic review will include the following:

10.4 Anthropometry

Weight, Body Mass Index and weight history will be assessed.

10.5 Biochemistry

In patients who meet the IBS diagnostic criteria the dietitian will ensure that the following tests have been done to exclude other diagnosis [6]:

- Full blood count (FBC)
- Erythrocyte sedimentation rate (ESR)
- C-reactive protein (CRP)
- Antibody testing for coeliac disease (endomysial antibodies (EMA) or tissue transglutaminase (TTG)

10.6 Clinical Assessment

The dietitian will ask the patient about the history of their bowel condition and about their current bowel symptoms. An evaluation of the severity of the patients IBS symptom profile, before and after dietary intervention is essential. The Bristol Stool Form Scale aids IBS sub typing [14]. The symptoms to be assessed include abdominal pain/discomfort, abdominal bloating, increased flatulence, abdominal gurgling, bowel urgency, incomplete evacuation, heartburn, nausea, tiredness and bowel frequency.

The predominant IBS symptom profile is identified:

- Diarrhoea predominant (IBS-D)
- Constipation predominant (IBS-C)
- IBS mixed pattern (IBS-M)
- Unsubtyped IBS (IBS-U)

Hydrogen breath tests (e.g. lactose, fructose, lactulose) are not routinely available across the UK but where they are available results may help guide the management pathway.

The dietitian will record any medication that the patient is taking for their bowel condition or other health problems, and note any possible side effects.

The patients understanding and acceptance of their diagnosis of IBS should be assessed. Some patients may have difficulty accepting the diagnosis of IBS as this will have been based on a number of ‘negative’ investigations being carried out and associating the term ‘IBS’ as an unacceptable diagnosis. IBS is one of the functional bowel disorders [17] and many clinicians use the term ‘functional bowel disorder’ rather than IBS which may be better accepted.

10.7 Dietary Assessment

Patients may be asked to keep a food and symptom diary before seeing the dietitian. Alternatively the dietitian will take a detailed diet history at the first appointment. For patients who already exclude certain foods from their diet, how they think these foods affected their IBS symptoms will be discussed. Previous attempts at dietary modifications and the results of these dietary changes will be explored. The use of dietary supplements (vitamins, minerals, probiotics and prebiotics) should be reviewed.

The dietary assessment will consider [3]

- Is the patient following a regular meal pattern, taking time to eat and avoiding long gaps between meals
- Check for healthy eating, considering intake of milk/lactose, dietary fibre, fatty foods, fluid, caffeine and alcohol

Lifestyle considerations include

- Exercise and relaxation
- Stress, anxiety and the demands of everyday life including psychological and psychosocial factors
- Frequency and timing of symptoms e.g. meal related, daily, weekdays, weekends, holidays

10.8 Management

The aims of nutritional management are to advise on dietary modifications that may help to improve symptom severity without jeopardising the overall quality of the patients diet. Evidence based guidelines for the dietary management of irritable bowel syndrome in adults for use by registered dietitians detail a dietetic care pathway [19]. These guidelines have systematically reviewed key aspects of the dietary management of IBS in adults with the aim of improving clinical effectiveness and patient outcomes. The guidelines include an IBS algorithm (Fig. 10.1) which describes a three step sequence of interventions.

10.9 First Line Dietary Management

First line dietary advice addresses the importance of eating at regular intervals and healthy eating guidelines. Advice on simple strategies to help the patient establish a regular meal pattern, taking time to eat, avoiding eating quickly and chewing food well can be effective in reducing symptom severity.

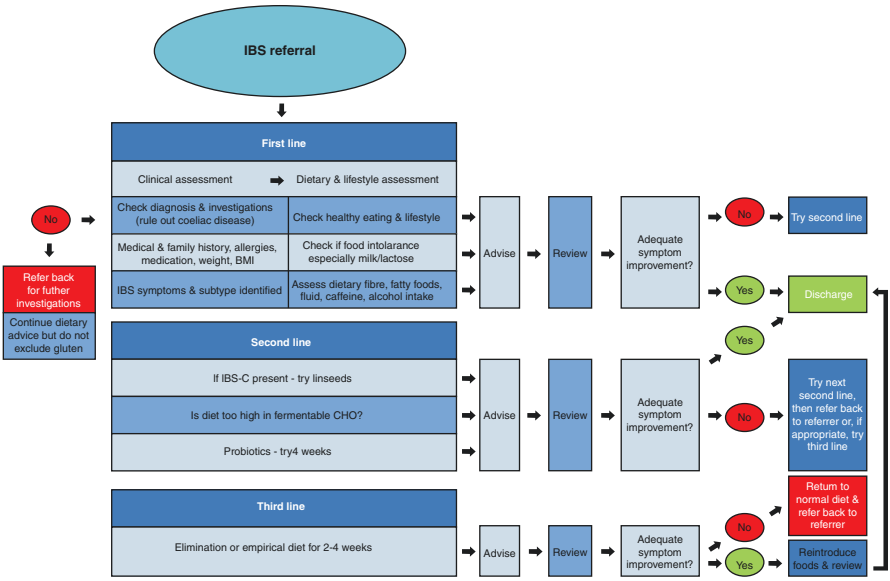

Fig. 10.1 Algorithm for the dietary management of IBS

10.10 Food Intolerances

There may be concern that abdominal symptoms are due to a food allergy but true food allergies are rare and are unlikely to cause irritable bowel symptoms. Food intolerances can be a cause of abdominal symptoms and it should be explained to patients that the most reliable way to identify food intolerances is by eliminating possible trigger foods from the diet and then reintroducing them.

Many patients with IBS restrict their intake of dairy products to try and alleviate symptoms thought to be due to lactose intolerance. Lactose is a disaccharide found in mammalian milk (cow, goat, sheep and human) that is hydrolysed in the jejunum by the enzyme lactase. Lactose malabsorption occurs when lactose is not absorbed in the small intestine. The lactose passes into the colon, where it can cause symptoms of lactose intolerance which are similar to symptoms of IBS e.g. abdominal pain, bloating, flatulence and diarrhoea. The incidence of lactose intolerance in patients with IBS is up to 50 % [16] but some IBS patients without lactose malabsorption describe symptoms of lactose intolerance. Lactose hydrogen breath tests can be used to diagnose lactose intolerance but may not always be available. If lactose intolerance is diagnosed or suspected a diet and symptom history should be taken and if appropriate, lactose can be excluded from the diet to see if symptoms resolve. Dietetic review is important to ensure long term nutritional adequacy as milk and dairy products are good sources of protein, calcium and other nutrients. Lactose intolerance should be

confirmed, if a breath test is unavailable, with a lactose food challenge and review of symptoms [16]. Gradual lactose reintroduction can be helpful to establish the patients' individual tolerance level. Most individuals with lactose malabsorption can tolerate 12 g lactose (240 ml milk) without developing symptoms if this intake is distributed throughout the day [35]. The inclusion of some milk or dairy products increases dietary variety and will help to improve nutritional adequacy.

10.11 Dietary Fibre

Alterations in dietary fibre intake have been a major part of the dietary management of IBS, despite there being conflicting evidence for increasing or decreasing dietary intakes. Soluble fibres (pectin, B-glucan from oats and barley, and gums in psyllium) undergo significant fermentation whereas insoluble fibres (celluloses, some hemicelluloses and lignin) tend to undergo slow and incomplete fermentation and have a greater effect on stool weight. Dietary supplementation with bran is no longer advocated [8] and there is little evidence to suggest that increasing fibre intake improves IBS symptoms [6, 19]. It may be helpful to limit intake of high fibre foods (wholemeal or high fibre cereal products and whole grains) and limit intake of fruit to three 80 g servings a day [6]. Decreasing fibre intake should reduce stool bulk and frequency and is recommended in IBS-D.

10.12 Dietary Fat

Studies have shown that patients with bowel dysfunction have increased sensitivity to fat in the small intestine, which induces symptoms of fullness, bloating and nausea [5, 25]. In patients whose main complaint is abdominal bloating it has been shown that there is slow transit of intestinal gas [25], due to an inhibition of small bowel motor activity. Lipids in the duodenum inhibit small bowel intestinal motility and delay intestinal gas transit, and this affect is increased in patients with bloating. In contrast, duodenal lipids stimulate colonic motor activity [30]. The colonic response to lipids is enhanced in patients with IBS and lipids exacerbate rectal hypersensitivity in this group [7]. Ileal and colonic overstimulation by lipids may explain post prandial diarrhoea. If the diet history reveals a high fat intake, advice on modifying the fat content of a patients diet should be given and evaluated.

10.13 Fluid

An adequate fluid intake of eight cups a day [6] should be promoted, with advice on restricting intake of caffeine containing fluids. In healthy individuals caffeine is a stimulant of colonic motility and it is likely that this response is increased in patients with IBS [4]. Many patients report symptoms following caffeine consumption [13] and often naturally restrict their intake.

10.14 Alcohol

Alcohol consumption has not been found to be associated with IBS in population based studies [11]. However, work on perceived diet related gastro-intestinal symptoms has reported a role for alcohol stimulating symptoms among IBS patients [20, 31]. Binge drinking has been associated with increased GI symptoms in IBS pts [26]. Alcohol tolerance will vary between patients but adhering to healthy limits for consumption should be encouraged.

10.15 Second Line Dietary Management

The evidence based guidelines [19] for the dietetic management of IBS patients details advanced dietary interventions and probiotics as second line management strategies. The advanced dietary interventions include consideration of supplementation with linseeds and review of fermentable carbohydrate intake.

In IBS-C dietary supplementation with linseeds (Flaxseed) can help improve constipation, abdominal discomfort and bloating [36]. Practically, patients can be advised start with one teaspoon to one tablespoon a day of brown or golden linseeds (whole or ground) added to breakfast cereals, yoghurt or salad. It is recommended that 150 ml fluid should be taken with each tablespoon of linseeds. The maximum amount of supplementation with linseeds recommended is four tablespoons (24 g) a day [19]. Improvements in constipation, abdominal pain and bloating from linseed supplementation may be gradual and may take up to 6 months.

10.16 The Low FODMAP Approach

A diet with increasing evidence of efficacy for the management of IBS is the low fermentable oligosaccharides (fructans and galacto-oligosaccharides), disaccharides (lactose), monosaccharides (fructose in excess of glucose) and polyols (FODMAP) diet. FODMAPs are poorly absorbed short-chain carbohydrates.

FODMAPs can be subclassified into two categories

1. **FODMAPs that are poorly absorbed in some people: fructose, lactose, polyols.** The ability to absorb these varies between individuals, the symptoms will vary.
2. **FODMAPs that are not absorbed in anyone: fructans and galacto-oligosaccharides.** These are fermented in the colon and will result in symptoms in susceptible individuals

Ingestion of short-chain fermentable carbohydrates can trigger gastro-intestinal symptoms such as abdominal pain, abdominal bloating, flatulence and diarrhoea. FODMAPs induce symptoms by two mechanisms, increasing small intestinal water

volume and colonic gas production due to rapid fermentation by gut bacteria to short chain fatty acids.

The osmotic effect of FODMAPs and the increased small intestine water volume may worsen abdominal pain and result in diarrhoea [32]. The increase in colonic gas (hydrogen and methane) production results in luminal distension and pain in those with visceral hypersensitivity. FODMAPs have also been shown to decrease small intestine transit times [18]. Therefore restriction of dietary fermentable carbohydrates may be effective in managing IBS symptoms and is an area that has been the focus of much clinical research and attention in the past 10 years. In a retrospective study patients with both fructose malabsorption and IBS, 74 % responded well to dietary restriction of fructose and fructans [29]. In a controlled trial comparing IBS patients receiving advice on FODMAP restriction with those receiving standard dietary advice, more patients in the FODMAP restricted group reported satisfaction (76 %) with their symptom response compared to those given standard advice (54 %) [34]. In the UK, the low FODMAP diet was found to be superior to national guidelines in IBS management in a nonrandomised, comparative study [34]. Both RCT's [12, 23] and uncontrolled trials indicate that, in patients with IBS, the symptoms most responsive to fermentable carbohydrate restriction are bloating, flatulence, abdominal pain, urgency and altered stool output. Up to 70 % of patients report benefit from following the low FODMAP approach [32].

Avoidance of FODMAPs requires specialist dietetic knowledge, including an understanding of their effects on the gut and dietary sources [10]. Dietary intervention involves an initial appointment with a specialist dietitian who will advise on a 4–8 week exclusion of foods high in fermentable carbohydrates (FODMAPs). Compliance and symptom management is aided by the provision of detailed resources on the avoidance of high FODMAP foods and suitable alternatives to help maintain nutritional adequacy [10]. On review the patient will be asked to re-evaluate their symptoms, and if they report symptom improvement they will be advised on a process of gradual reintroduction of high FODMAP foods to tolerance. If there has been a significant improvement in symptoms there may be reluctance to reintroduce high FODMAP foods back into the diet and the dietitian will educate the patient on the benefits of reintroducing these foods. The process of FODMAP food reintroduction helps to determine the thresholds for symptom occurrence and can help to liberalise the diet and make food choices easier for the patient. A recent addendum (2015) to the NICE guideline on irritable bowel syndrome in adults recommends that advice on the low FODMAP diet or exclusion diets only be given 'by a healthcare professional with expertise in dietary management'.

The low FODMAP diet is complex in its nature and many commonly eaten foods are restricted (cereals and breads, dairy products, some fruits and vegetables) which has led to concern about the nutritional adequacy of the diet. A lower calcium intake has been reported [33] in patients with IBS following the low FODMAP diet when compared with controls. This is likely to be due to a lower intake of dairy foods and highlights the importance of good dietary advice on low lactose dairy alternatives.

There are concerns regarding the effects of the low FODMAP diet on the GI microbiota. One study has shown a marked reduction in luminal bifidobacteria after just 4 weeks following the low FODMAP diet [33]. Possible benefits of bifidobacteria for

humans include immunomodulation and the production of short chain fatty acids. Whether this reduction in bifidobacteria persists after the reintroduction of high FODMAP foods back into the diet has not yet been investigated. The long term consequences of this alteration in luminal bacteria are also not known. The benefit of the low FODMAP diet plus supplementation with probiotic bifidobacteria is an approach that requires investigation.

10.17 Probiotics

A trial of probiotic supplementation is recommended, as part of second line dietary advice, after a trial of reducing dietary FODMAPs. The term probiotic has been defined as 'a live organism that, when ingested in adequate amounts, exerts a health benefit to the host' [27]. Probiotics are available in different formulations and maybe single or multistrain.

The pathogenesis of IBS is multifactorial, with the gastrointestinal microbiota being proposed as having a role to play. Studies have reported a luminal dysbiosis in IBS with the theme of a reduction in lactobacilli and bifidobacteria. Investigation of mucosal microbiota have shown lower bifidobacteria in IBS-D patients than controls, and a negative correlation between mucosal bifidobacteria and the number of days that patients experienced pain or discomfort [24]. Whether these changes are primary or secondary events is less clear. Other factors that influence the gastrointestinal microbiota include age, diet, disease and use of antibiotics.

To be of clinical benefit probiotic bacteria must be able to survive GI transit and then be able to demonstrate functional efficacy. Immunomodulation by probiotics is key to their mechanism of action.

Many probiotic supplement are available, with different brands containing different organisms, single or multiple organisms, and differing quantities of organisms. Probiotic supplements commonly contain Lactobacillus and Bifidobacterium species which have been reported as having a beneficial effect on IBS symptoms, especially on bloating and flatulence.

Clinical trials and systematic reviews largely support the use of probiotics in IBS, but further investigations are needed to establish the optimal regimens (probiotic species, strain, dose) as well as which patient groups are most likely to benefit from these treatments. Meta-analyses suggest a beneficial effect of probiotics on global symptoms, abdominal pain and flatulence [37].

NICE guidance recommends that patients who choose to try probiotics should be advised to take the product for at least 4 weeks whilst monitoring the effect [6].

10.17.1 Gluten

The possibility of gluten as a trigger of IBS symptoms has been raised as some patients, who have not been diagnosed with coeliac disease, have reported symptoms on ingestion of gluten containing foods. The term non coeliac gluten sensitivity has been acknowledged. The role of gluten related symptoms in IBS needs

further work and the benefits of a gluten free diet remains unclear. It is yet to be determined whether it is the fructan (a FODMAP) content of wheat and not the gluten that is the issue in wheat sensitive IBS patients.

10.18 Third Line Dietary Management

The British Dietetic Association guidelines on the dietary management of IBS in adults recommends the use of elimination or empirical diets as a third line approach. These diets have been used to identify food intolerances in those with IBS. An elimination diet allows a selection of low allergen foods and an empirical diet excludes common food allergens associated with a specific condition. Both of these diets may take 3–4 months to complete and on review the appropriateness of following such diets and the likelihood of success needs to be considered. If completion of an elimination or empirical diet is not thought to be in the patient's best interest, then they should be referred back to their clinician for review of other treatment options. Food allergy occurs in 1–4 % of the adult population and can provoke GI symptoms. Medical management may be needed for existing or suspected food allergy.

Conclusion

Effective management of IBS and bowel dysfunction involves a multi-modal approach, with dietary modification providing a powerful tool that should not be ignored. There is a growing body of evidence that supports the use of the low FODMAP diet if removal of other IBS triggers and lifestyle advice have not led to an improvement in symptoms. Food is a common cause of symptoms in IBS and dietary assessment and advice can help to empower the patient to self-manage their condition.

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The Pharmacological Management of Chronic Constipation and Faecal Incontinence

11

Nikolaos Kamperidis and Naila Arebi

11.1 Pharmacology for Constipation

Chronic Constipation represents one of the commonest gastrointestinal disorders, affecting about 16 % of the adult population and about a third of those over the age of 60 [1]. The symptoms pose a significant burden on sufferers so much that the impact on health related quality of life is comparable to that of diabetes mellitus and chronic obstructive airway disease [2]. The detrimental impact on the quality of life (QOL), [3] can be curtailed by adopting a timely and effective treatment approach.

Drug development in this field has been relatively slow compared to other disciplines of gastroenterology. The main reason for this delay is the deficiency of high quality clinical studies trials until recently. Constipation is a symptom rather than a disease, encompassing several pathophysiologies and posing a challenge in defining eligibility criteria. Moreover, there is no diagnostic test; instead the diagnosis is based on self-reported symptoms. Likewise there are no objective investigations or biomarkers to support physiological improvement to therapy and no validated endpoints for the trials. Furthermore, psychological co-morbidities, such as depressive and eating disorders, co-exist with chronic constipation in up to 65 % of patients in tertiary centers [4]. These concomitant conditions may influence adherence to medical treatment, the course of symptoms and the perception of therapeutic response. Lastly, the multifactorial pathophysiology of gut motility disorders, involves more

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complex pathways than the lack of a specific receptor or transmitter. As this has only partly been scientifically explored it limits the number of therapeutic targets that can be pharmacologically modulated [5].

In order to facilitate drug development, the United States Food and Drug Administration (FDA) and European Medicines Agency (EMA) issued guidance for the conduct of clinical trials, setting definitions of response in order to allow comparison between groups and clinical trials for functional gut disorders [6–8]. By standardising patient reported outcomes, multiple aspects of symptomatic control and quality of life within a trial design are addressed [6–8]. The definition of response to investigational medicinal products is an improvement in stool frequency by at least 1 complete spontaneous bowel motion per week and a decrease in the weekly average of worst abdominal pain in the previous 24 h score (measured daily) of at least 30 % compared with baseline weekly average [6].

There are several published guidelines on the investigation and management of constipation. The American Gastroenterology Association and the National Institute of Clinical Excellence in the United Kingdom concur on the value of lifestyle measures, and advice on discontinuation of possible aggravating agents, prescription of laxatives in a stepwise cost-effective manner with interim investigation and biofeedback training for refractory cases [1, 9].

The following chapter describes the evidence on the available pharmacological agents for chronic constipation, focusing on clinical efficacy, their adverse effects and their use in clinical practice.

11.2 Laxatives

Many patients attempt to address symptoms through an increased dietary fiber intake. Although a recent meta-analysis showed that this approach results in a 20 % increase in stool frequency, some symptoms such as stool consistency and abdominal discomfort do not improve [10]. Moreover, dietary interventions such as “bran” ingestion, which accelerates the whole gut transit, tend to aggravate bloating and abdominal discomfort in patients with IBS and constipation [11].

Approximately 20 % of patients with chronic constipation consult a physician and between 16 % and 40 % of them use laxatives [12] The majority of these patients are not satisfied with the efficacy of laxatives and a few have concerns regarding their safety [13]. A recent meta-analysis of seven clinical trials involving 1411 patients concluded that laxatives were more effective that placebo in achieving symptomatic control. Only 40 % of patients assigned to a laxative failed to respond, compared with 73 % of patients assigned to placebo and the number need to treat with laxatives to prevent one treatment failure was between 3 and 6, [12]. Prescription of laxatives remains a reasonable and cost-effective first line choice for the symptomatic control of chronic constipation. There are four main categories of laxatives: bulking agents, stool softeners, osmotic and stimulant laxatives.

11.2.1 Bulking Agents

Bulking agents increase stool weight and water absorbent properties and reportedly increase the stool frequency by a mean of 1.4 stools per week [14]. A randomized placebo controlled trial of 22 patients given Psyllium for 8 weeks reported increased the bowel frequency and the mean stool weight compared to placebo. Moreover, individuals treated with Psyllium reported improved consistency and reduced pain on defecation compared to those receiving placebo [15]. Another placebo controlled trial assessing the effect of a preparation containing Psyllium, Aloe Vera and Celandine in 35 patients with constipation drew similar conclusions [16]. Overall, although the evidence base is relatively limited, bulking agents are safe and recommended as first line options for the management of chronic constipation by national guidelines [9]. Their main disadvantage is the possible exacerbation of bloating, which limits their value in patients with constipation predominant IBS [14].

11.2.2 Stool Softeners

Stool softeners hydrate the stool bolus, improving its consistency to facilitate it passage through the colon [17]. A number of agents belong to this category. One of the most popular is Sodium Docusate, a synthetic anionic detergent that allows the passage of water and fat in the stool [18]. There are no large scale studies evaluating its efficacy, and, a review of its clinical usefulness based on the available published studies questions it value [19]. Moreover, a comparative study of Sodium Docusate and Psyllium concluded that the later is superior in achieving better frequency and consistency of bowel motions [18]. Another previously used stool softener, liquid paraffin, was effective in symptomatic relief however as it can cause malabsorption of fat soluble vitamins, it is no longer recommended [14].

11.3 Osmotic Laxatives

This group of laxatives attracts water in the intestinal lumen, to soften the stools and improve propulsion [14]. The most commonly used osmotic laxatives are Lactulose and Polyethylene Glycol (PEG). One small placebo controlled study showed that Lactulose was more effective than placebo [20]. The efficacy of PEG is supported by more than one study. In a randomized control trial including 139 patients, PEG was superior to placebo in achieving increased frequency, improved consistency and less straining among patients with IBS-C [21]. Another placebo controlled trial reported an 80 % success rate for PEG compared to 30 % for placebo in symptomatic relief from drug-induced constipation [22]. This effect was proved to be effective at the longer term as well: PEG was superior to placebo in a study with 6 month follow up that reported efficacy of 52 % for PEG and 11 % for placebo at 6 months, showing that PEG might be a long term option for the management of chronic

constipation [23]. This effect was further pointed in a meta-analysis of 21 studies on the efficacy of PEG in children, adults and elderly patients, concluding that it can be a safe and effective approach [24]. PEG is available with or without electrolytes. Formulations without electrolytes seem to have better taste as this was assessed by volunteers [25].

A comparative study between PEG and Psyllium, showed that PEG was more effective with 92 % and 73 % overall efficacy respectively [26]. A head to head comparison between Lactulose and PEG showed better efficacy rates for PEG. In this 4 week study with 115 patients, the mean stool frequency was higher with PEG compared with lactulose (1.3 vs. 0.9) [27]. The use of PEG was also associated with decreased straining score and less abdominal pain, bloating and flatus, making it a good option for patients with IBS-C, where bloating and flatus are predominant issues [27]. It was also deemed to be a cost-effective choice [28]. Between 1997 and 2007, ten studies were conducted comparing Lactulose with PEG and a Cochrane analysis of these studies concluded that PEG was superior to Lactulose for the following outcomes: stool frequency, stool consistency, relief of abdominal pain and need for additional agents [29].

Overall, osmotic laxatives are effective and well tolerated. However, most of the studies conducted to date, include patients with a significant diversity of their underlying causes of constipation and the follow up data are insufficient for safe conclusions to be drawn on their longer term efficacy, a desirable outcome in patients with a chronic condition. Osmotic laxatives are recommended as second line agents by both the AGA and NICE guidelines [1, 9].

11.3.1 Stimulant Laxatives

Stimulant laxatives improve symptoms by increasing intestinal motility and secretions via stimulation of the myenteric plexus [14]. The current evidence suggests that they are more effective than placebo. Bisacodyl, a diphenylmethane derivative, has an anti-absorptive, secretory and prokinetic effect, which was more effective than placebo in a randomized controlled trial of 368 patients [30]. Bisacodyl led to 5.2 spontaneous motions per week, significantly higher than 1.9 weekly spontaneous motions with placebo. Its effect was greater for secondary endpoints such as physical discomfort, patient satisfaction, psychological discomfort and overall concerns [30]. A randomized placebo controlled trial of Sodium Picosulphate vs. placebo among 367 patients that fulfilled the Rome III criteria for functional constipation, showed that patients allocated on the treatment arm experienced an increase in weekly motions from 0.9 to 3.4 motions per week, whilst patients allocated to placebo increased their weekly motions from 1.1 to 1.7 [31]. The superiority of Sodium Picosulphate was also observed for secondary endpoints, such as quality of life and overall satisfaction [32]. The efficiency of stimulant laxatives against placebo was reported in a recent meta-analysis [12].

The role of this group of laxatives in the management of chronic constipation is hampered by reports of increased abdominal discomfort and episodes of diarrhoea, in 5.6 % and 31.8 % of treated patients respectively [32] This limits their

value, particularly among patients with irritable bowel syndrome. Moreover, there is concern about dependency and the possibility of rebound constipation after drug discontinuation, but these concerns have not been supported by unequivocal evidence [33].

Stimulant laxatives are not considered first line agents in the management of chronic constipation given that both Psyllium and Lactulose were more effective than either Sodium Docusate or Senna [18, 32] The AGA guideline defines their role for the management of refractory cases as an adjunct to other laxatives to enhance response [1].

11.4 Prokinetics

Despite the widespread use of traditional laxatives, up to 75 % of patients remain dissatisfied with the treatment, mainly due to the persistence of concomitant symptoms such as bloating and abdominal discomfort [34]. Better understanding of intestinal motility physiology, resulted in a novel category of drugs directed at intestinal receptors involved in the regulation of gut motility, namely 5-hydroxytryptamine receptors (5-HT).

There are several 5-HT receptors and the key one involved in modulation of gut function is 5-HT4. These receptors are however found at sites other than GI tract such as the CNS, bladder, and heart [35]. Within the GI tract 5-HT4 receptors are expressed in enteric neurons as well as smooth muscle cells and their activation leads to acetylcholine secretion with an increase of propulsive motility [35]. The effect of some prokinetic drugs is not restricted to 5-HT4 receptors; for instance Tegaserod, also stimulated 5-HT1 and 5-HT2 receptors. The lack of selectivity may have contributed to adverse events associated with this drug, which resulted in withdrawal of its marketing license. The adverse events included adverse cardiovascular outcomes, ischaemic colitis and increased risk of abdominal surgery [35].

In contrast, Prucalopride, is a highly selective 5-HT4 receptor agonist with none of the adverse effects reported with Tegaserod [36]. In rodents, Prucalopride promoted gastrointestinal motility [37]. In fasted dogs, administration of Prucalopride stimulated high amplitude clustered contractility in the proximal colon and decreased the time to the first giant migrating contraction [38].

A phase III randomized placebo controlled trial included 620 patients with severe chronic constipation who were randomized to receive either placebo or Prucalopride at two doses for a period of 12 weeks. Resolution of constipation (at least three complete bowel movements per week) occurred for 30 % of patients in the treatment arm compared to 12 % of patients in the placebo arm. The clinical benefit was evident after 4 weeks of treatment with the commonest adverse events being headache, nausea and diarrhoea [36]. Almost half the patients on Prucalopride reported improvement in their quality of life with treatment compared with 25 % of those on placebo [36]. Similar results were reported in two subsequent trials with 641 [39] and 718 patients respectively [34]. Collectively, of the patients who completed these 3 pivotal studies, 86 % continued open label treatment with Prucalopride, in order to define the durability of the symptomatic benefit [40]. Based on patient

assessment of constipation related quality of life, the longer term symptomatic improvement continued for a median of at least 18 months [40].

As the majority of patients in these studies were females the license was restricted to women. The UK NICE recommends Prucalopride for women with constipation who have failed at least two laxatives [41]. Since these recommendations a phase 3 randomized placebo controlled trial of 374 male patients with chronic constipation reported superiority of Prucalopride compared to placebo, suggesting that Prucalopride is a therapeutic option for chronic constipation irrespective of sex [42].

The clinical effect of Prucalopride was also shown at the physiological level in a study on 50 healthy volunteers, where Prucalopride accelerated the colonic transit as assessed by scintigraphic techniques [43]. The three randomized placebo controlled trials showed colonic transit time decreased by 12 h in patients treated with Prucalopride compared with increased colonic transit time by 0.5 h, in those receiving placebo [44]. In all treatment groups, symptomatic responders had shorter colonic transit time at the end of treatment and those who remained symptomatic had significantly longer colonic transit time [44].

Prucalopride is the first agent subject to the rigorous study design and stricter outcome measures mandated by the FDA and EMA for efficacy in functional gut disorders [7, 8]. However, [45] a trend for loss of response over time, sheds doubt about its long term effectiveness over years.

11.5 Secretagogues

Modulation of intestinal secretion is another potential mechanism of treating chronic constipation and IBS-C. This has been an area of intense scientific research, for the development of newer potent agents [46]. Two putative secretagogue target molecules were recently identified: chloride channels and Guanyl Cyclase C receptors.

Chloride channels play a key role in the regulation of intestinal secretion [46]. Expression of chloride channels was shown to be expressed in a variety of tissues including the apical side of the intestinal epithelium, where it contributed to cell volume and pH regulation in addition to fluid and anion secretion [47]. Guanyl Cyclase C receptors, were identified as membrane spanning molecules which act as naturally occurring secretagogues: ligand binding to the receptor results in water and electrolyte secretion and thereby diarrhoea [48]. This section will focus on the effectiveness of two newly developed drugs, Lubiprostone and Linaclotide, as Calcium Channel and Guanyl Cyclase C receptor (GC-C) ligands respectively in the treatment of chronic constipation.

11.6 Lubiprostone

Lubiprostone is a metabolite of Prostagladin E which selectively acts on Chloride Channel 2 [47]. In vitro, Lubiprostone stimulates chloride secretion from monolayers of T84 cells in a concentration dependent manner [49]. In conscious rats,

administration of Lubiprostone increases the amount of luminal water and sodium [49] and in mice it increases small intestinal mucous secretion [50] and smooth muscle contractions [51]. In a small study on patients with chronic constipation, Lubiprostone increased gastric secretions by 50 % and gastric mucous secretion by 85 %, advocating its role as a "luminal lubricant" [52].

A phase II randomized placebo controlled trial of 195 patients with constipation predominant IBS, reported a significant improvement in the scores for constipation, straining and abdominal pain in Lubiprostone assigned patients compared with placebo [53]. The main assessment of the efficacy of Lubiprostone occurred in two phase III randomised controlled trials that included 1171 patients (90 % females) for a duration of 12 weeks [54]. The primary endpoint was clinical response, defined by an at least moderate weekly relief as recorded in patients' electronic diary: 17 % of patients on Lubiprostone compared with 10 % of patients on placebo experienced a clinical response with a Lubiprostone adverse event profile comparable to that of placebo [54]. The clinical benefit persisted in the extension phase of the trials for at least 52 weeks [55]. A smaller trial, focusing on the usefulness of Lubiprostone in treating chronic constipation reported that patients randomised to receive Lubiprostone showed an increase in weekly motions number by 3.7 motions compared with 1.3 for placebo [56].

Lubiprostone is recommended by the AGA as a second line agent for the management of chronic constipation [1]. A recent technical appraisal issued by NICE in UK suggests that is should be considered for patients who failed treatment with two laxatives [57]. However, it should be noted that the landmark studies supporting the efficacy of Lubiprostone, [54] only show small differences in the clinical response rates between active drug and placebo, which reaches statistical significance but of contentious clinical significance.

11.7 Linaclotide

Linaclotide is a first in class of orally administered, 14 aminoacid peptide of the guanylin peptide family, with agonist activity to the GC-C receptors. GC-C receptors, are mainly expressed on the luminal surface of intestinal epithelial cells and are major regulators of fluid homeostasis [58]. In rats, Lincaclotide increased the volume of gastrointestinal secretions and accelerated gastrointestinal transit in a dose dependent manner [58]. Also, in visceral hypersensitivity animal models, Linaclotide significantly decreased colonic hypersensitivity, making it a promising agent for the management of IBS-C where pain and constipation co-exist in a bi-directional relationship [59]. The human safety of Linaclotide, was first described in phase I studies where its effect on stool consistency was noted [60]. In a phase II 5 day double blinded placebo controlled trial of Linaclotide among females with IBS-C and slow transit constipation, Linaclotide significantly accelerated colonic transit compared to placebo. This effect was also clinically manifested as acceleration of time to first bowel movement, increased bowel frequency, reduced straining and improved stool consistency [60].

Subsequent clinical trials supporting the efficacy of Linaclotide include a multicenter phase IIb randomized controlled trial of 420 patients with IBS-C. The primary endpoint was the number of complete spontaneous weekly bowel motions (CSBM). The CSBM for different doses in the Linaclotide group was 2.5–3.6 compared with 1.0 in the placebo group, an effect that was evident within 24 h after treatment initiation [61]. Stool consistency and need for straining also improved with all doses of Linaclotide and up to half of the patients on active treatment reported adequate overall symptomatic relief for at least 9 out of the 12 weeks of treatment compared with 22 % of those on placebo [61]. The efficacy and safety of Linaclotide was noted in 4 additional randomized controlled trials. The results of two randomized controlled trials using two different doses of Linaclotide (145 and 290 μg) against placebo reported that 20 % of patients with chronic constipation had at least 3 CSBM per week with an improvement of at least 1 CSBM from baseline in the treatment arm compared with 6 % for placebo [62]. Moreover, Linaclotide-treated patients experienced significant improvement in secondary endpoints such as stool consistency, abdominal bloating, severity of straining and severity of constipation [62]. Another phase III trial with 804 patients and 24 weeks follow-up showed an overall response rate of 34 % for Linaclotide 290 μg daily compared with 14 % for placebo treatment, applying the FDA definition for response in IBS-C. The NNT from this study was 5 [63]. It is noteworthy that Linaclotide was more efficacious in relieving constipation (48 % vs. 23 % for placebo) rather than pain (49 % vs. 35 % for placebo) [63]. This effect was reproduced in another phase III RCT of 800 patients followed up for 12 weeks. Interestingly, this trial had a randomized withdrawal phase which showed that on withdrawal of Linaclotide, patients' symptoms recur and reach the initial baseline level [64]. The main significant adverse event with Linaclotide compared to placebo was diarrhea, which led to treatment discontinuation in up to 5 % of patients [62–64].

In a recent meta-analysis of 6 clinical trials, the superiority of Linaclotide over placebo was established supporting its role in the management of chronic constipation and IBS-C [65]. Therefore, Linaclotide has passed the stringent FDA approval process and is now a key agent for the management of patients with constipation and IBS-C [66] In UK, NICE advised local decision makers to consider its place in the management of IBS-C, although a technology appraisal is pending [67].

Overall, the quality of evidence supporting the use of Linaclotide in constipation is robust and fulfils the criteria set by the FDA and EMA recommendations [6]. However head to head trials with other agents or interventions such as biofeedback training to define its exact place in the management of chronic constipation are missing, and its cost (£490 per year) [67] may discourage healthcare payers from funding its wide use for the management of a chronic disorder.

11.8 Bile Acid Modulators

Bile salt malabsorption occurs in various clinical circumstances (post cholecystectomy, terminal ileal resection or inflammation, idiopathic) and results in diarrhoea because the presence of unconjugated bile salts in the colon stimulates colonic

secretions and motility [46]. This mechanism offers a potential therapeutic pathway for constipation through passage of unconjugated bile salts to the colon [46]. To date two agents in this category have been investigated as putative agents in the management of chronic constipation: Elobixibat and Sodium Chenoxycholate.

11.9 Elobixibat

Initially named A3309, this agent reduces the absorption of bile acids in the terminal ileum by binding and partially inhibiting IBAT (Ileal Bile Acid Transporter) [68]. It was initially shown to improve meat-induced constipation in dogs [69]. In a small randomised double blinded placebo controlled trial of 30 patients, Elobixibat accelerated colonic transit time by almost two days at a dose of 10 mg per day, an effect that was accompanied by a trend towards increasing the number of spontaneous bowel motions. These effects were associated with minimal systemic absorption [69]. A second pilot study randomising patients to placebo and two different doses of elobixibat (15 and 20 mg) for two weeks, showed similar acceleration in the colonic transit time and improved symptoms of constipation [70]. The validity of these outcomes was further explored in a phase IIb trial including 190 patients with chronic constipation who were randomized to receive placebo or three different doses of elobixibat (5, 10, 15 mg) for a period of 8 weeks. There was a significant increase in the number of weekly spontaneous bowel motions among patients randomized in the treatment arm of the study. This was associated with decreased straining and bloating scores [71]. There were no serious adverse events in any of the studies, however one common adverse event was abdominal discomfort. Two phase III studies on Elobixibat for chronic constipation were conducted but were terminated due to distribution issues with the drug.

Although the evidence on the efficacy of Elobixibat among patients with chronic constipation is largely awaited, its safety profile and minimal absorption make it a promising future development [46].

11.10 Sodium Chenoxycholate (CDC)

CDC is a primary bile acid that has been traditionally used for the dissolution of gallstones. However, diarrhoea was noted as common side-effect [72]. In rats, CDC inhibited re-absorption of sodium and water in the terminal ileum and colon and increased the colonic permeability [73]. Administration of CDC to 24 patients with cholesterol gallstones and constipation, resulted in a marked improvement of symptoms of constipation [74]. More recently the results of a randomized controlled trial of CDC against placebo, including 36 female patients with IBS-C showed that CDC significantly improved stool frequency and consistency and reduced the need for straining compared to placebo. This was accompanied by physiological evidence as CDC accelerated the colonic transit of patients [72]. No major safety issues were identified, however, CDC was linked with abdominal discomfort in up to 50 % of patients and nausea up to 25 % of patients, in a dose

dependent manner [72]. The overall data for the use of CDC in the management of constipation are encouraging; however, only a small number of patients has been studied so far, and its association with abdominal discomfort and nausea can limit its use among patients with IBS-C.

11.11 Other Therapies

Most of the drugs discussed so far, target motility or secretory function of the GI tract. There are other modes of stimulating the gut. Electric stimulation is reported to have an effect on gut function. Sacral nerve stimulation, percutaneous and transcutaneous tibia nerve stimulation with the rationale and efficacy are discussed in a separate chapter. The gut microbiota is also reported to influence gut function and its role in the pathogenesis of constipation was explored through probiotics therapy [75]. As the probiotics are not considered pharmacological agent a detailed review was not included in this chapter, however a meta-analysis of 14 studies supports the role of specific probiotics to accelerate gut transit and improve stool frequency and consistency [76].

11.12 Future Directions

Velusetrag, is a highly selective 5-HT4 agonist that accelerated colonic transit in healthy volunteers [77]. In a small randomized controlled trial it significantly improved symptoms of idiopathic constipation compared to placebo [78]. Another selective 5-HT4 agonist, Naronapride, had greater efficacy than placebo among patients with chronic constipation in a phase II trial recruiting 214 patients [79]. Ghrelin receptor agonists, stimulate the defecation centre in the lumbosacral spinal cord and in animal models of constipation they induced defecation [80]. Ralomerelin, a Ghrelin 1a receptor agonist, accelerated colonic transit and improved the frequency of bowel motions in a randomized controlled trial of 48 female patients with chronic constipation [81].

The publication of FDA and EMA guidelines has set standards for the conduct studies on functional gut disorders by applying standardised definitions of a therapeutic response. This has encouraged development of new drugs in this field primarily based on newly acquired knowledge from basic science and animal models. This approach will yield further new drugs to address this chronic and difficult condition.

11.13 Pharamcotherapy for Faecal Incontinence

Faecal incontinence is the inability to control or the involuntary passage of faecal material [82]. It can be manifested as urge incontinence, passive incontinence or faecal seepage [82]. Faecal incontinence is a common problem affecting up to 8.3 %

of the community population irrespective of sex [83]. Its incidence increases with age and can affect up to 15 % of the over 70 population [83] rising to 20 % if nursing home residents are included [84]. Faecal incontinence has a significant impact on patients' quality of life leading to social isolation, embarrassment and even loss of employment. This effect relates to the severity of the symptoms [83, 84].

Faecal incontinence is associated with significant costs for patients and health services. In a hospital setting it can be associated with significant need for nursing time and also costs relevant to consumables [85]. A questionnaire based study among the outpatient population with faecal incontinence showed significant costs related to treatments, outpatient visits, consumables and loss of working hours [86].

It should be noted that faecal incontinence is a symptom rather than a diagnosis. Therefore a key management component is the clarification of the nature of symptoms and the exclusion of other diagnoses such as Inflammatory Bowel Disease, gastrointestinal cancer and faecal loading as a misdiagnosis may have detrimental implications [87].

The treatment options for faecal incontinence range from dietary and lifestyle modifications to biofeedback training, sacral nerve stimulation and colostomy formation [88]. In between all these options the pharmacological management and optimization of medical therapy can be a useful adjunct particularly prior to embarking on surgical procedures.

Unfortunately, to date there is lack of high quality clinical trial evidence base for medical therapies for the management of faecal incontinence [89]. A Cochrane review of the medical therapies available for the management of faecal incontinence highlights the weakness of the existing evidence to guide clinicians in educated decisions [90]. However, a consensus of expert opinions recommends conservative measures as a first line management plan [89].

The following chapter describes the evidence on the available pharmacological agents for faecal incontinence, focusing on the evidence of their clinical efficacy.

Drugs can be effective in the management of faecal incontinence as monotherapy or in combination with other treatment modalities such as biofeedback training [91]. The main mechanisms of action include the regulation of the intestinal transit time (constipating agents) and the increase in the closing pressure of the anal canal [92].

11.13.1 Constipating Agents

Loperamide: Loperamide is widely used for the management of faecal incontinence. It is a μ-opiate receptor agonist without significant systemic effect [82] and its effect is exerted by delaying the colonic transit and improving the function of the anal sphincter. loperamide delayed the appearance and reduced the volume of the rectal effluent when studied after intragastric administration of electrolyte solution [93].

The evidence supporting its use stems from studies with a small number of patients where therapy was prescribed for a short time interval and outcome were measured with by self-reported questionnaires. A randomized double blinded placebo controlled crossover study including patients with incontinence after

ileo-pouch anal anastomosis showed improvement of symptoms, better nighttime continence and increased resting pressure of the anal sphincter [94]. Similar results were obtained from an earlier crossover study among patients with chronic diarrhoea and incontinence [95]. A later clinical trial recruiting patients with orlistat related incontinence showed a dose dependent symptomatic response [96].

When patients with incontinence failed to improve with methylcellulose, the addition of loperamide resulted in significant improvement in up to half of the patients studied [97]. This suggests that perhaps more than one pharmacological agent or treatment modality is required for the effective management of faecal incontinence. The ongoing CAPABLe trial aims to recruit almost 300 patients with incontinence to provide a larger scale comparison between loperamide, placebo, biofeedback and combination of biofeedback with loperamide using a validated outcome measure [98].

Diphenoxylate: Diphenoxylate is another opiate agonist but compared with Loperamide, it is less selective and associated with central nervous system effects [82]. It was less effective than loperamide in the management of FI when studied in a double blinded placebo controlled cross-over trial [99].

Amitriptyline: Amitriptyline prolongs colonic transit time and has been used empirically for the treatment of faecal incontinence. There is only one open label study exploring the effect of low dose amitriptyline in faecal incontinence. In this study on 18 patients suffering from faecal incontinence a significant symptomatic improvement was observed in 90 % of patients in addition to reduction in rectal motor complexes and increase the anal sphincter tone [100].

Cholestyramine: Cholestyramine is an anion exchange resin, predominantly used in the treatment of diarrhoea secondary to bile salt malabsorption. It is also one of the treatments used for the pharmacological management of faecal incontinence. The evidence base for its use had been mostly anecdotal, however a small study comparing biofeedback training with or without the addition of cholestyramine showed a significant added benefit with the use of cholestyramine, in terms of stool consistency and frequency of incontinence episodes [101].

11.13.2 Bulking Agents

The use of bulking agents can be implemented as means to improve the stool consistency in order to make it amenable to better control from patients with weak anal sphincters. It can be a particularly useful strategy among patients who are incontinent of liquid stool. A placebo control clinical trial showed that fiber supplementation with psyllium or gum Arabic in 39 patients suffering from incontinence to liquid stool, decreased the episodes of incontinence by more that 50 % [102]. A single blinded placebo control trial comparing psyllium with gum Arabic, methylcellulose and placebo showed superiority of psyllium compared to placebo [103]. A separate placebo controlled cross-over study in 47 patients compared a low residue diet, placebo and loperamide with a neutral diet, fiber supplementation and loperamide. The efficacy was measured using the Faecal Incontinence Severity Index

(FISI) as outcome measure [104]. Both treatment arms showed an improvement in FISI from baseline and no significant difference in the degree of improvement between the two arms [104].

11.13.3 Treatments Aiming to Increase the Anal Sphincter Pressure

Phenylephrine gel, an alpha-1-adrenergic agonist, was shown to increase internal anal sphincter tone when studied in vitro. Additionally, when administered parenterally in animals, this effect was also observed in vivo. The same effect was observed in a study of 12 healthy volunteers, in whom the resting anal sphincter pressure increased in a dose dependent manner, after local anal application of phenylephrine cream [105]. The same effect was observed in the anorectal physiology measurements of ten patients with faecal incontinence when local application of phenylephrine was compared to placebo [106]. Although a small trial suggested a positive symptomatic response of topical phenylephrine in up to 50 % of patients with faecal incontinence, [107] this effect was not reproduced in other trials [108, 109].

Conclusions

This chapter describes the pharmacological options for the management of faecal incontinence. Although such options exist, their optimisation suffers from the lack of good quality randomized controlled studies with robust end-points. Certainly, none of these constitutes a "cure" for faecal incontinence, however they can be very useful tools in adjunct to other modalities in the context of a multi-disciplinary approach.

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Pharmacology for Constipation

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Pharamcotherapy for Faecal Incontinence

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Rectal Irrigation

12

Monica Lyons

12.1 What Is Rectal Irrigation?

Rectal irrigation (RI) can be beneficial in managing functional bowel disorders such as constipation and faecal incontinence [11] and also neurogenic bowel. NICE (2007) describes Rectal Irrigation as a specialist treatment modality for patients with faecal incontinence and constipation. They recommend its' use after manipulating the patients diet and fluid intake, trying anti-diarrheals to alter the stool consistency and utilizing the gastro-colic reflex to stimulate movement in the colon due to gastric stretching caused by food ingestion [1]. NICE also recommend that when these initial steps do not provide sufficient symptom relief, the patient should be referred for specialist management and treatment that may include ano-rectal physiology, endo-anal ultrasound and defecating proctogram. [14], described retrograde colonic irrigation in patients with bowel disorders and faecal incontinence and soiling. Faecal incontinence affects between 5 % and 10 % of the general population, although these figures may be underestimating the true prevalence due to embarrassment and subsequent unwillingness to report. It can negatively impact on the sufferer's confidence and quality of life, and can be socially isolating. Fortunately, management choices are continuing to be developed for patients presenting with these distressing and embarrassing symptoms. Clinicians are now able to offer patients multi-treatment modalities. For the patient with passive soiling, injectables may be placed into the external sphincter together with regular use of anti-diarrheal agents such as Loperamide (Imodium) to firm stool consistency and reduce stool frequency, combined with small volume irrigation such as the Qufora mini to "flush" the rectum post defecation. Rectal irrigation has been shown to be far more effective than elastomer implants in patients with soiling. This was demonstrated in a study by Van Der Hagen et al. in 2012, which compared the effectiveness of elastomer

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implants versus rectal irrigation in post-partum women with internal sphincter obstetric injuries. Rectal irrigation may be introduced as a good second option but the long-term therapeutic benefit depends on the severity of soiling complaints on the one hand and the therapeutic compliance on the other hand. Another study looking at the therapeutic effect of colestyramine after failure of Psyllium and rectal irrigation is poor.

Constipation or obstructive defection syndrome (ODS) affects approximately 10 % of the general population. Although these symptoms may cause considerable physical discomfort such as abdominal pain and bloating, people with constipation often self-manage with diet and over-the counter laxatives or these may be advised via primary healthcare. Often presenting to secondary care following several years of increasing constipation, patients may have tried colonic irrigation at the hands of a therapist in an attempt to relieve their symptoms. Although there is no evidence to support colonic irrigation, patients report feeling better following this procedure. Cost of having this done on a regular basis is often prohibitive. Management strategies for constipation has also increased in recent years and may include the use of anti-protikinetics such as Procalopride (Resilor), Lupiprostine or Linacopride, which may be used together with an irrigation system. Clinicians require training to guide appropriate patient selection, based on clinical symptoms, risk and on the patient's willingness and motivation to continue to incorporate RI into their bowel management regime.

12.2 Rectal Examination

A specialist health-care professional should be consulted before instigating the Irrigation procedure. An extensive medical history should be taken to identify any clinical contra-indications or precautions to using rectal irrigation and to capture the broad spectrum of symptoms involving constipation and faecal incontinence. There is a well-identified link between psychological disturbance and constipation both in literature and in the clinical environment [2, 3, 13]. It is therefore helpful to identify any past or present psychological problems.

Any red flag symptoms which include rectal bleeding, weight loss, family history of bowel cancer, abdominal pain and also the cause of diarrhoea should be investigated according to the local policy. There remains debate on the need for endoscopic investigation prior to commencing RI. Endoscopy is not without risk with 1; 10,00 colonoscopies resulting in bowel perforation: this figure is reduced to 1: 40,00 for flexible sigmoidoscopy. If the patient has had previous colorectal surgery then endoscopy is essential, otherwise it is dependant on the patient and their family history, availability and risk. The clinician must carry out a digital rectal examination in order to exclude benign ano- rectal conditions such as anal fissure or fistulae, ano-rectal pathology such as polyps or carcinoma, stricture, to assess for rectal contents, tone and strength of the anal sphincter complex and also the patient ability to both squeeze and relax and bear down.

If hard stool is present then this must be disimpacted prior to commencing irrigation, otherwise the irrigation will not be effective and also the stool may be masking the presence of rectal pathology.

There is a known risk of bowel perforation following the insertion of a catheter into the rectum and placing water under pressure into the rectum and distal bowel. The reported cases to date are estimated at two in 500,000 although this data only relates to Peristeen. The risk of bowel perforation may increase the longer that a patient is using it.

There may be other unreported cases of bowel perforation, but this is difficult to quantify due to its widespread use in the community.

Perforation may occur due to the rectum being punctured by the catheter, by over-inflation of the rectal balloon with either air or water, or pressure in the rectum and distal colon due to the introduction of water, which may increase pressure with the luminal walls of the colon.

Patients need to both be informed of the risks prior to agreeing to use it and also both the patient and their carer be taught how to recognise perforation if it occurs. However this needs to be balanced against the possible improvements in their symptoms and quality of life together with alternative treatments available e.g. formation of a stoma. Informed consent must be recorded in the patients' medical notes. The signs of colonic perforation are sudden and include; increasing severe abdominal pain, abdominal distension and tenderness, fever and nausea/vomiting. The patient needs to be advised to stop irrigating immediately and to seek urgent care.

12.3 What Choices Are There for Patients?

The first purpose-designed Rectal Irrigation devise to appear on the market, which was both CE, marked and available on prescription in the UK, was the Peristeen Trans-anal irrigation system, available from Coloplast Ltd. This availability allowed both users and clinicians to have access to this method [4]. There are now several other devices also available on prescription which include:

The Qufora IrriSedo Mini system, which is a low volume rectal irrigation device, with a re-usable reservoir and a disposable tip. After filling the reservoir with tap warm water, the patient sits on the toilet, inserting the tip into the anal canal and using it to either start or aide in completion of defecation. It is mostly used by patients to relieve incomplete bowel evacuation, passive or post-defaecatory soiling. An audit on Qufora mini by [5] showed symptom improvement in two thirds of the participants with passive soiling/incomplete evacuation. Please see Fig. 12.1.

12.4 The Qufora Cone System

The Qufora Cone and bag system can be used as either a low or high volume irrigation system. The bag is filled with warm tap water and the system primed. The patient then sits on the toilet, inserts the cone into their rectum, prior to opening the

Fig. 12.1 Qufora mini system

gate to allow flow of water into the rectum. There is also the option to squeeze the pump for added pressure if required. (Please see Fig. 12.2).

12.5 Qufora Catheter System

This is a water- filled catheter system, which after priming is inserted into the patient's rectum, prior to filling the balloon with water following which water is pumped into the rectum and left colon. This is predominantly used for high-volume irrigation. (Please see Fig. 12.4)

12.6 Qufora Bed System

Patients who are unable to support themselves in an upright position can benefit from the use of this system to aide in the evacuation of their bowels.

A 60 mls catheter is placed into the rectum whereby water is flushed in and drained away hygienically into a large bag, which is all part of an enclosed system. This system requires a trained carer to carry the procedure out for the patient who will be bed-bound. This author has limited experience of this system having used it on a patient bed-bound with MS while admitted to hospital with constipation. While it proved effective in managing this patient's bowel while an in patient- it was not at that time possible for this to be continued in the community.

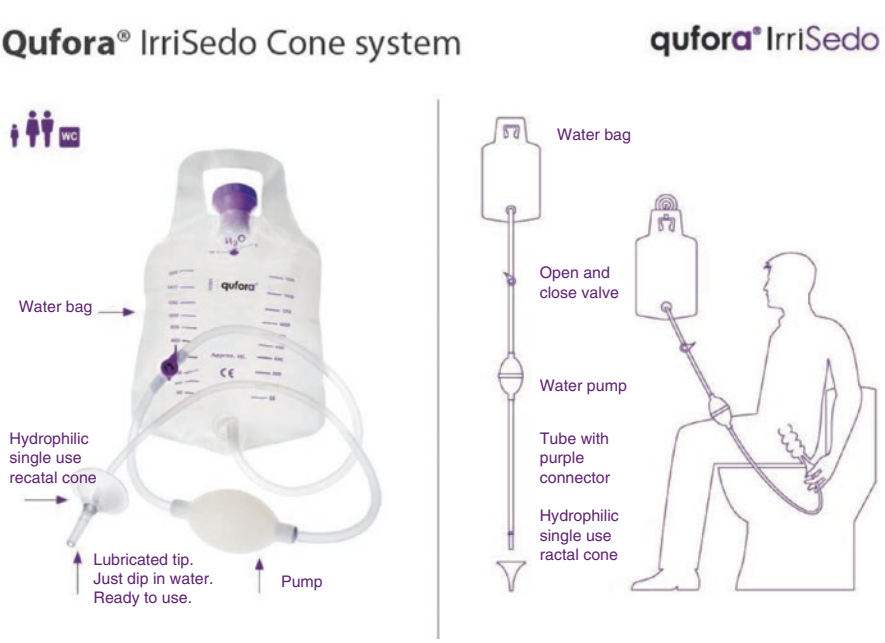

Fig. 12.2 Qufora cone system

12.6.1 Peristeen Trans-anal Irrigation

This is an air-filled catheter system. After the system is primed the patient inserts the catheter into their rectum, which is then held in the rectum by pumping a small volume of air (2- maximum of 5 hand-pumps) into the balloon. By pressurizing the bag, water flows into the rectum and left bowel, stimulating peristalsis and evacuation of stools (Fig. 12.3).

12.7 B. Braun IryPump S

This is an electrical pump and cone device which means no manual pumping of water is necessary. The pump is electrically charged then detached from the mains prior to use. After priming the tube through to the cone with water, the patient then places the cone into their rectum and turns on the pump. This pump has six choices of speeds and can instill up to 1500 mls of water into the rectum. The soft rubber cone can be washed and reused for up to 3 months (Fig. 12.4).

12.8 The Aquaflush Systems

12.8.1 Compact System

The Compact system is designed for users who need just a small amount of water to 'jump-start' the evacuation process or as a final washout after a natural movement. The

Fig. 12.3 Peristeen trans-anal irrigation

Fig. 12.4 B. Braun Irypump system

system features soft plastic cones and one-way valves that prevent p prevent back-flow. It also comes with an extension tube (optional) to allow for more flexibility

12.8.2 Quick System

This is a bag and cone system. It has a temperature strip on the water bag for easy regulation. There are extension tubes and straps to anchor the pump to your leg together with hooks to hang the bag off. The cone has a soft-rounded tip, with two opposing eyes

which allows water to pass out of the cone in 3 directions, thereby reducing water pressure in the bowel and is set with a right- angled connection, with a quick release connector with finger holes on the cone for easy grip. The kit comes with a long glove – for containing the cone when you are finished and acting as a disposal bag. All connectors have one- way valves. The paper pulp cone is for single use, which can be used up to three times within one session, and then will biodegrade.

12.9 Consent

An appropriately informed person must obtain valid consent for the procedure of rectal irrigation, voluntarily and this must be documented in the patient's records. No one can give consent on behalf of another adult who is deemed to lack capacity. However such patients can be treated if it is deemed to be within their best interest. For further information regarding consent and mental capacity please refer to the following documents:

- Department of Health Reference Guide to Consent for Examination or Treatment (2009).
- The Trust's Policy and Procedural document for consent to examination or treatment (current version).
- Mental Capacity Act (2005).

This method of bowel management should be discussed with the patient and carers prior to starting and written information provided so that the patient is able to make an informed choice. All the suitable available systems should be demonstrated and the final choice must take into account the patient or carer's preference and also their ability to use the kit safely. A letter should be sent to their GP advising them on the type and purpose of the irrigation selected and asking the doctor to continue the prescription for the client.

12.10 Indications

Patients may be referred from a variety of clinical settings. The clinician will then decide whether they feel that irrigation is appropriate and safe.

Patients that can be considered suitable for rectal irrigation include those with:

Box 12.1
Neurogenic bowel dysfunction caused by:
Spinal cord injury
Spina bifida
Multiple sclerosis
Cauda equina
Parkinson's disease

Constipation:
- Slow-transit constipation
- Pan-colonic dysmotility

Obstructive defecation syndrome
- Rectal Prolapse
- Perineal descent
- Pelvic floor dysynergia
- Intra-rectal intussusception
- Solitary rectal ulcer
- Anterior rectocoele
- Pelvic Floor prolapse

Faecal incontinence:
- Passive incontinence: this is when you pass stool or flatus with little or reduced awareness that it is happening.
- Urge incontinence: can be defined as an awareness that you need to open your bowels, but are unable to hold onto the stool until you get to a toilet, resulting in leakage.
- Post-defactory soiling

Anterior resection syndrome

Relative contraindications (use after discussion with an appropriate medical practitioner) Norton 2011
- Pregnant or planning pregnancy
- Active perianal sepsis
- Diarrhoea
- Anal fissure/fistulae
- Large haemorrhoids that bleed easily
- Faecal impaction
- Past pelvic radiotherapy with associated bowel symptoms
- Known Diverticular disease
- Use of rectal medications for other medical condition
- Congestive heart failure
- Less than 6 months since anal surgery

Absolute contraindications:
- Active acute inflammatory bowel disease
- Known obstructing rectal or colonic mass
- Rectal or colonic anastomosis within the last six months
- Sever cognitive impairment (unless carer to carry out or provide direct supervision)

12.11 Neurogenic Bowel

Neurogenic bowel dysfunction, often together with urinary and sexual dysfunction after spinal cord injury (SCI) or if there is a neurological disease process present such as multiple sclerosis, Parkinson's or Spina bifida. There is a higher risk of

both constipation and faecal incontinence in patients with spinal cord injury. [6] demonstrated in a randomized control trial that Trans-Anal irrigation improved faecal incontinence, constipation in patients with SCI and because of this an improved quality of life. However, care still needs to be taken as there remains the risk of bowel perforation, indeed a case study reported in 2009 described a rectal perforation occurring on the second attempt at irrigation. This was despite giving oral and written information to the patient, instructions in its use and supervision by a nurse on the first attempt. The article did not specify whether the patient had been rectally examined before irrigating or bowel pathology had been excluded. Nevertheless this is a reminder that perforations can and will occur to patients using rectal irrigation.

When advising your patient with SCI on bowel management strategies: there is little evidence base on which to base your recommendations. Current bowel strategies are largely based on experience and may be down to "trial and error". These may include the use of colonic stimulants e.g. Bisacodyl suppositories, bulking agents e.g. Psyllium, stool softeners e.g. Sodium Docusate, hyperosmular agents e.g. Laxido. If the patient has flaccid bowel function then they need to aim for firmer stools to reduce episodes of faecal incontinence. In reflex bowel function, softer stools are the aim. Other methods to help trigger a bowel action include enemas, abdominal massage or digital stimulation (inserting a finger into the anal canal to aide relaxation of the external anal sphincter). Significant numbers of patients still rely on manual evacuation as it is effective and also shortens time spent on bowel care. Unless the patient is able to perform this independently there can be issues if a carer or nurse is required to carry this out for the individual.

Unfortunately what prevents constipation can lead to incontinence and vice versa. The initial studies using Trans-anal irrigation were carried out on patients with neurogenic bowel. It has been found to be effective for both constipation and faecal incontinence in a randomised controlled trial in people with spinal cord injury [16]. Following a stroke, 31–40 % of patients can experience faecal incontinence- and the degree will depend on the severity of the stroke, however at 6 and 9 months this incontinence reduces significantly, [7]. Rectal irrigation can be introduced to the patient with progressive neurological disease such as Multiple Sclerosis, Parkinson's disease or Neurofibromatosis who are experiencing bowel dysfunction. As the disease process progresses- these patients often experience mixed bowel symptoms: sluggish bowels, little or no warning to defecate, unpredictable episodes of faecal soiling and urge faecal incontinence. By introducing an irrigation system this can, often through persistence, time, trial and error on behalf of the patient, can empty the rectum and distal colon and reduce or indeed stop these distressing episodes. Bowel dysfunction in patients with neurological disease has been studied and 50 % of a group of 30 patients with multiple sclerosis, who had failed to respond to traditional strategies, had symptomatic improvement after using RI. Patients with Parkinson's disease had symptomatic improvement in their constipation [8]. The patient may need structured, on-going support and encouragement to carry on using the system.

12.12 Complications for the Spinal Cord Injured Patient

Individuals who have a spinal cord injury above T6 can develop autonomic dysreflexia (AD). 80 % of cases occur within the first year of injury; however it can occur after several years. AD is an abnormal response to a stimulus below the level of injury, for example a blocked catheter or a full bowel. The patient describes a sensation of "impending doom" together with a slow heart rate and a severe increase in blood pressure, flushing, sweating, blotchiness above the level of injury, nasal congestion often with a pounding headache. These are serious symptoms, which need to be recognised and managed promptly with anti-hypertensive's with immediate identification and removal of the offending stimulus; otherwise the patient may rapidly deteriorate and even die.

12.13 Slow Transit Constipation

Obstructive defecation
Faecal incontinence

12.14 Low Anterior Resection Syndrome (LARS)

Patients who have had a traditional anterior resection with sphincter preservation for rectal cancer may experience faecal urge incontinence, frequent bowel movements and evacuatory difficulty [15]. This can be due to loss of rectal capacity due to reduction in rectal reservoir together with alteration to the anorectal reflexes that control continence if there is disruption of the internal/external sphincters. These symptoms are most acute in the immediate post-operative period and improve and plateau at approximately 1-year post surgery. If the patient has had adjuvant radiotherapy, inflammation, an anastomotic leak or an ultra-low anastomosis then this increase the likelihood of developing LARS. Patients with formation of an ileo-anal pouch can also experience bowel dysfunction. Both of these groups have shown to benefit from the use of RI. Trans-anal irrigation has proven to relieve functional continence in this group of patients. In a small study, up to 79 % of patients had a reduction in stool frequency and reducing incontinent episodes [9, 10].

12.15 Patient Training

Once the patient has decided to try irrigation they will require a comprehensive real-time demonstration of the kit in clinic. As all patients will learn at a different pace this needs to be addressed in the early stages to ensure that they are reasonably confident in using the kit prior to starting to irrigate. This can involve "hands-on" simulated training so that they can have a supervised practice of preparing and using the kit while in the healthcare environment. The patient can be given written

information to read at home to prepare them for this session. The information should explain the risks as well as the benefits. Ideally all patients should be supervised when carrying out the first irrigation; however this is not always possible. This may be due to patient choice, having to travel post RI on public transport. Patients with altered sensation should digitally check for the presence of stool in the rectum and remove either manually or using a suppository or enema. In SCI patients should be supervised at least once and twice if there is a history of Autonomic dysreflexia.

12.16 Patient Support and Follow Up

Once patients have started to irrigate they may encounter practical problems such as water leakage while irrigating, ineffective irrigations, problems with kit itself and these need to be addressed early on or patients will abandon its use. At GSTT patients can chose to self-refer to the Group Irrigation Sessions where they can receive peer support and encouragement and also troubleshoot any equipment problems directly with the companies nursing representative.

12.17 Staff Training and Competency

Appropriate clinicians who have undergone a period of training and supervision can provide rectal irrigation to their patients. Coloplast have recently developed a set of competencies, which provide a clear framework for the Peristeen system and can be easily adapted to both other irrigation systems and to local policy. All the other companies will arrange and provide training for both staff and patients in the clinical area and provide certificates for professional portfolios.

12.18 Low Volume Versus High Volume Irrigation

There are different types of RI systems available commercially. There are the catheter systems (Peristeen Coloplast Denmark or Mallinckrodt, St. Louis, MP, USA) or cone shaped anal tips (Coloplast Denmark, Qufora irrigation system, MBH, Allerod, Denmark, IryPump S B. Braun, Germany). The idea behind the catheter systems is that once the balloon is inflated inside that rectum that this provides a seal against water leakage during irrigation. As an alternative to this, the cone systems are placed into the anal canal and are then held in place throughout the irrigation. As yet there is no clear evidence supporting one system over another. The patient can be shown the different kits that are available and can chose or as often happens in clinical practice the clinician will guide the patient to the system that they think will be most beneficial to them. Patient with neurogenic bowel in practice have better symptom relief with a catheter system. All patient using the catheter systems need to be advised on the number of pumps to use to inflate the balloon, which is usually between 2 and 5 pumps- depending on their hand strength. They need to be

pre-warned that the balloon may burst inside the rectum if it is over-inflated with possibility of ano-rectal trauma. The volume of irrigation fluid to be used will depend on the symptoms to be managed and the type of kit chosen.

Often there is an overlap in symptoms with patients experiencing both incontinence and constipation/evacuatory dysfunction. It is best practice to use the least volume of water to achieve the maximum response – thereby reducing the risk of perforation or over-loading the patient with fluid. It is not uncommon for patients to use too much water- then this can over-stimulate the bowel and cause the patient to make a send or third visit to the toilet to ensure that they are empty. The average volume of water used is 750 mls. Patients will normally be recommended to commence with 500–1000 mls of water, however in practice patients can have symptom relief from smaller volumes of even 200 mls The water should be room temperature as cold water may instigate abdominal cramps and water that is to hot may damage the delicate lining of the colon and rectum.

Coloplast recommend that water is pumped in at one pump per second. Water should not be pumped in to rapidly as this may lead to abdominal cramping, pain and spasm within the rectum leading to expulsion of the catheter/cone. Conversely when the water goes in to slowly it may not cause sufficient pressure and stimulus on the colonic walls and result in an ineffective irrigation.

Case Study 1

A.P is a 28-year-old male with Spina Bifida. He works full-time in the city.

The patient currently lives alone in a house. He walks independently. He self catheterises up to six times per day as he also has a neurogenic bladder.

A.P. came to the bowel function clinic for a second opinion, having been offered a surgical management by means of a stoma – at another hospital. He presented with having suffered from daily urge and passive faecal incontinence to a variable stool, for as long as her can recall. When the stool is firm he describes difficult evacuation and when the stool is soft/loose he gets little warning and is unable to retain. He has no sensation of rectal filling and is unable to ascertain if he has completed defecation. He had tried Stimulant & Osmotic laxatives and also both Glycerine & Bisacodyl suppositories. His unpredictable episodes of incontinence are now causing him to work from home, avoid social interaction and stop eating for fear of stimulating the gastro colic reflex and triggering an incontinent episode. This has caused him to experience weight loss, poor self-image, social isolation and low mood.

Assessment & Investigations

Rectal examination performed after consent obtained
Saddle parasthesia
Open anus at rest.
Little to no resting pressure
No active squeeze
Poor propulsive effort

Soft stool palpated high in the rectum.

Abdominal examination performed after consent obtained

The abdomen was soft and non-tender

Defecating Proctogram: The rectum had a normal lie at rest. No active lift. Prompt initiation of evacuation. On bearing down there was intra-rectal intussusception into the rectum, Oxford Grade 2–3. 50 % of the contrast was emptied.

Ano-rectal physiology: The maximum mean anal canal resting pressure was normal (50–120 mmHg) at 65. The maximum mean incremental squeeze pressure was low (<60 mmHg) at 18 mmHg. Anal canal length was normal (2–5 cm) at 2 cms. Threshold sensation was normal at 50 mls of air. Urge sensation normal at 90 mls of air. Maximum tolerated volume was normal at 150 mls of air. Recto anal inhibitory reflex was present.

Endo-anal ultrasound: The internal and external sphincters were intact and of normal thickness for the patients

Colonoscopy and Flexible Sigmoidoscopy normal

Functional Scores

St Marks Continence Score = 22 out of a maximum score of 24

Thompsons Constipation Score 4 out of a maximum score of 4

Nursing Diagnosis

Bowel incontinence and evacuatory difficulty secondary to Spina Bifida.

Bowel Function Clinic Treatment aims

Reduce episodes of bowel incontinence

Establish a predictable bowel pattern- with bowels opening at least every 3 days

Treatment Plan

Patient to start having regular small meals

Taught correct toilet positioning and effective waist propulsion

To use Loperamide elixir or tablets if the stool is soft/loose

Demonstration of the Peristeen RI system in outpatients

Risks and benefits explained

Patient gave consent and this was documented in the patient's records

Patient advised to commence using RI daily with 4–500 mls of water

Telephone review after 2 weeks: Patient reported that he was now using the kit daily after having a few "teething problems with water leakage. His episodes of both urge and passive soiling were reducing and he was able to evacuate his bowels to small amounts of stool most days. He was experiencing water leakage around 30 min after irrigating.

Troubleshooting

Sometimes the air-filed balloon can cause spasm in the rectum, which can then expel the balloon-, also as he had a reduced resting pressure and an open anal canal- this may have prevented a good seal. Pt advised to try pumping the water in more slowly and also to try reducing then increasing the number of hand pumps when filling the balloon.

After 6 weeks: The patient is reports continuing to experiment with water volumes/timings. He describes overall a significant improvement in both his control and evacuatory problems. He now has the confidence to start socialising and has gained weight due to an improved diet.

At 3 months he was reviewed in the male group irrigation clinic-where he received support from other male users and also the Peristeen nurse advisor.

Currently AT has been using the Peristeen system for 3 years, and although he is not completely continent, he describes his control as 85 % improved and that this improvement has significantly increased his quality of life.

Case Study 2

ND is a 52 years old lady who was referred to see one of the colorectal surgeons at GSTT in 2006. She had been diagnosed with Multiple Sclerosis in 1984. She suffers from depression, which she describes as affecting her appetite. She presents with daily urge & passive faecal incontinence a variable bowel habit with constipation and abdominal bloating. ND avoids intimacy with her husband due to fear of faecal incontinence during intercourse. She has been self-catheterising 4–6 times per day for several years.

Assessment & Investigations

Rectal examination performed after consent obtained

Normal perianal sensation to touch

Perineal scarring form previous obstetric injury

Closed anus at rest

Reduced resting pressure

Moderate squeeze

Large anterior rectocoele

Firm stool present in the rectum

Poor propulsive effort

Abdominal examination performed after consent obtained

Soft and non-tender although slightly distended

Defecating Proctography revealed a large anterior rectocoele with retained contrast

Transit Study showed both slow transit with markers retained throughout the colon and also outlet obstruction with markers clustering in the rectum and sigmoid colon.

Ano-rectal physiology showed that both resting and squeeze pressures were reduced

Endo-anal ultrasound showed a defect in both the external & internal sphincter

Functional Scores

St Marks Continence Score was 23 out a maximum of 24

Thompsons Constipation Score was 3 out of a maximum of 4

The patient was reviewed in the consultant clinic and a discussion was had regarding a surgical repair of the rectocoele by means of a Trans-vaginal rectocoele repair. The patient declined this, choosing conservative management via the bowel function clinic.

Nursing Diagnosis

Bowel incontinence and constipation, incomplete bowel evacuation difficulty secondary to reduced anal sphincter function due to obstetric injury, incomplete emptying attributed to the anterior rectocoele and constipation secondary to MS.

Bowel Function Clinic Treatment aims

Reduce episodes of incontinence

Improved dietary intake

Bowels open every 2 days with less incomplete evacuation

Discuss referral for psychological support for depression

Resume an intimate relationship with her husband

Treatment Plan

Referred to dietician and in the meals to eat 3 meals per day

Taught vaginal splinting to aide in emptying the rectocoele

Discussed with the patient the introduction the Peristeen RI system

Demonstration of the Peristeen RI system in outpatients

Risks and benefits explained

Patient gave consent and this was documented in the patient's records

Patient advised to commence using RI daily with 4–500 mls of water

Telephone review after 2 weeks: ND reported that she was now using the kit daily with 500 mls of water. She reported that she had found the kit relatively easy to use and although she was experiencing less incontinence – she still experienced a sensation of incomplete bowel evacuation and her bowel pattern remained variable and unpredictable. Now consuming three meals per day.

Advise to increase to 800 mls of water daily.

At the 6-week telephone review ND was opening her bowels every 2 days to a variable stool post-irrigation with 800 mls of water. Finding the use vaginal splinting helpful- continuing with regular meals. Less incontinence and reduced episodes of incomplete bowel emptying.

Patient reviewed by telephone at 3 months and 6 months and I year. Confidence, incontinence and constipation all improved. Peristeen every 2 days with 800–1000 mls of water. Has resumed a sexual relationship with her husband.

Over the years ND has re-presented to the bowel function clinic with deteriorating bladder and bowel symptoms. This was attributed to worsening MS and also to the regular use of Tramadol, Pregabalin and Paracetamol for low back pain. This has been managed by the introduction of Bisacodyl tablets.

Subsequent relapses have resulted in hospital admission, with loss of function below the waist, no sensation to defecate, a tight band sensation around the diaphragm and altered sensation in her mouth. Following this admission I referred ND to her local continence support team.

Currently: ND has been using Peristeen RI for 11 years every 2 days with 8–1000 mls of water. ND now takes Domperidone 10 mg daily for nausea. Added Procalopride 2 mg 2 years ago for the slow transit constipation and added the Femmeze (rectocoele aligner) 2 years ago to splint and aide rectocoele emptying.

Case Study 3

DD is a 65 year old male, currently working as a businessman who presented to the bowel function clinic in 2009. He was 6 months post anterior resection syndrome for Dukes A rectal cancer, 9 cms from the anal margin. The surgery had been performed via a laparotomy with a covering ileostomy which had been reversed 4 months post-operatively. His symptoms on referral included:

Daily urgency/urge and passive incontinence
Soft stools Bsc Type 5–6
Clustering of stools in the evening
Anger and frustration- wished to have the stoma back
Reduced social activity due to fear of incontinence
Stool frequency 6–10 times day- specifically in the evening
Assessment and Investigations
Rectal examination performed after consent obtained
Anus closed at rest
Perianal soiling
Reduced resting and squeeze pressures
Anastomosis palpated approximately 5 cms from the anal verge
Soft stool present high in the rectum
Good co=ordination and propulsive efforts on bearing down
Abdominal examination performed after consent obtained
Abdomen soft and non-tender

Scars from recent surgery visualised- well healed with no inflammation or infection evident

Ano-rectal physiology = Reduced resting and squeeze pressures/rectal hypersensitivity with reduced maximum volume tolerate

Endo-anal ultrasound showed that both the internal and external sphincters were intact

Defecating proctogram showed a weak pelvic floor with rapid emptying.

Colonoscopy and CT scan = no recurrent disease

Functional Scores
St Marks Continence Score was 18 out of a maximum of 24
Thompsons Constipation Score was 2 out of a maximum of 4
Nursing diagnosis
Anterior resection syndrome
Treatment plan
Pelvic floor exercises to improve his sphincter tone and strength
Taught correct toilet positioning together with effective bracing
Titrated doses of Loperamide 2 mg to firm the stool to Bsc Type 3–4
Re-assurance that his control will improve
Review after 6 weeks
Bowel frequency reduced to 4 times in the evening
Improved stool consistency Bsc Type 4
No recent episodes of faecal urgency
Faecal leakage improved
Still struggling with evening "clustering"
Coping with symptoms better/less angry/frustrated
Plan:
Introduced the Qufora Mini irrigations system and the Cone Toilet system
Full demonstration
Risks and benefits explained
Patient consented to use and this was documented in the patient's notes
Patient to alternate the kits every evening 60 mls in the mini/200 mls in the cone system
Review at 12 weeks
Carries the Qufora mini in his pocket so that he can use to wash out the rectum when he needs to evacuate his bowels while out of the house.
Uses the Cone system 2 – times per week, which allows him to open his bowels within 19 min of use to a normal stool.
Bowel control improved.

12.18.1 Group Sessions

Group sessions were set up at St. Thomas Hospital in 2008 to provide support and follow-up for patients using rectal irrigation. The original purpose was to provide a relaxed environment where patients could learn the technical aspects of using irrigation and to gain advice from other "irrigators". As the sessions evolved it became clear that patients were also sharing their personal experience of living with a functional bowel problem and were reporting that sharing this information with fellow sufferers was therapeutic and cathartic. One patient expressed this saying, "I thought that I was the only one with this bowel problem", another shared "despite using the irrigation kit before going our-I was incontinent at the bus stop It is well established

that patients with reduced bowel control often avoid seeking support due to embarrassment and this may cause them to wait years before speaking to a healthcare professional [11].

There is no literature supporting the use of groups in patients using rectal irrigation, however there is a wealth of evidence its benefits for patients with other health problems such as mental health problems such as anxiety and also cancer.

Patients who were new to irrigation may be naturally apprehensive about using it for the first time, could be gently encouraged by more experienced irrigators.

12.18.2 My Opinion on High Volume Versus Low Volume?

When we choose an irrigation system together with the patient- we need to consider the Volume of water that will achieve the most effective symptom relief. Patients with passive or post-defactory soiling secondary to a weak internal sphincter together with incomplete bowel emptying may simply require to use to use the Qufora Mini Irrigator with 60 mls of water post defecation.

Higher volume irrigation systems such as the Qufora cone System may be useful in the patient who is unable to evacuate their rectum and distal colon independently. This may be related to having poor propulsive effort due to a weakened pelvic floor or obstructive defecation caused by an anterior rectocoele. Patients may also choose a cone system over the catheter systems because of its simplicity and ease of use. The Cone system can be used with small or higher volumes of water, but as it requires gravity – it does need to be hung above head height when the patient is seated on the toilet.

Both the Peristeen and Qufora catheter systems can be used with small and large volumes of Irrigation. But it cannot be over-estimated the variety of teaching and on-going support that patients will need to become confidant in self-irrigating.

In the authors experience, advising patients to start with a small volume of water (2–400 mls) either daily or every second day until they become proficient in using the kit and also become accustomed to the sensation of water in the colon. After the patient has been irrigating for 2 weeks with this low- volume- then I will review the patient by telephone to offer support and to troubleshoot if necessary. If the patient's symptoms are improved to their satisfaction then I advise them to continue to use the low volume. If they are not- then I advise then to gradually increase the water up to 800 ml for 6 weeks. Telephone review at this six-week point establishes the effectiveness of the increased volume and at this point patients can increase to 1000–1200 mls if necessary.

In the author's experience, some patients are naturally apprehensive prior to embarking on the use of an irrigation system. Patients who have suffer from a Neurogenic bowel and may be already self-catheterizing are on the whole more accepting of the use of irrigation and motivated to experiment with volumes of water to achieve rectal emptying. This can, however depend on the time from the

Spinal injury/surgery as patients close to their loss of function may be reluctant to irrigate in the hope that their rectal sensation and function will resolve. Patients with a neurogenic bowel may be more anxious regarding perforating their bowel, as they are unable to feel the presence of the catheter in their rectum and of the balloon filling.

Conclusion

In the UK, RI is now an established treatment option for patients with bowel dysfunction; however there remains limited evidence base for the use of RI in clinical practice and its use is largely based on expert opinion and patient experience together with the clinician's experience. Patient selection based on a comprehensive clinical history and physical examination, which will highlight any contraindications or red flags, is essential, which should take into consideration their motivation and also any psychological issues. It should be introduced to patients as part of a treatment pathway, after or together with other conservative strategies. Clinical specialists need to be appropriately trained and competent to support and advise patients in what is essentially a nurse or specialist physiotherapist service. Ongoing support needs to be developed to prevent patients abandoning RI through lack of support and clear guidance.

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Review Article

Consensus Review of Best Practice of Transanal Irrigation in Adults

17. AV Emmanuel, K Krogh, G Bazzocchi, A-M Leroi, A Bremers, D Lede, D van Kuppevelt, G Mosiello, M Vogel, B Perrouin-Verbe, M Coggrave, P Christensen, Members of the working group on Trans Anal Irrigation from UK, Denmark, Italy, Germany, France and the Netherlands. Spinal Cord. 2013; 1–7& 2013 International Spinal Cord Society All rights reserved 1362-4393/13.
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Transanal Irrigation Best Practice AV Emmanuel et al 6 Spinal Cord

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Neuromodulation

13

Yasuko Maeda and Carolynne Vaizey

13.1 Introduction

Electricity has fascinated mankind since ancient times. It was first used for medicinal purposes as early as the first century when Scribonius Largus, a physician to the Roman emperor, used electrical shocks to treat knee pain by asking patients to stand on electric rays on the seashore. Since then, there have been numerous descriptions of electrical therapies for both physical and psychological problems.

Despite the long history of electrical therapies for medicinal purposes, their use for faecal incontinence (FI) and constipation is a relatively new phenomenon dating back a mere two decades. Traditional approaches to the treatment of faecal incontinence have aimed to restore sphincter muscle integrity through various forms of repair or muscle support using other muscles and artificial sphincters. As greater than 50 % of patients with faecal incontinence present with damaged sphincters due to obstetric injury, anal surgery or trauma, this would seem a logical approach but the results of such interventions have not withstood the test of time. There is also a group of patients who present with intact but functionally weak sphincters, sometimes attributed to neurological damage, to systemic diseases such as sclerosis and diabetes, or to the repeated trauma of stretching or to radiotherapy.

Refractory constipation has historically been treated with colectomy but this generally fails to alleviate the symptoms of abdominal pain and bloating that are the main complaints of the majority of patients [1].

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It was therefore revolutionary when in 1995 [2] Matzel first reported the use of sacral nerve stimulation (SNS) as a possible treatment for faecal incontinence. In the last 20 years, this therapy has evolved and has also contributed to the expanding use of nerve stimulation or neuromodulation in various forms, not only for faecal incontinence but also for constipation.

The long-term outcome of SNS for FI is beginning to emerge giving us a better understanding of this treatment and highlighting potential complications and untoward events associated with SNS not encountered in the early phases of the treatment [3, 4]. Reports on SNS for constipation and/or evacuation difficulties are limited and having increasingly disappointing results [5, 6] despite initial enthusiasm for this technique [7, 8].

Whilst other nerves such as the pudendal nerve have also been stimulated in an attempt to alleviate functional bowel symptoms in trial settings only tibial nerve stimulation is currently used in routine clinical practice.

This chapter describes the current status of neuromodulation for faecal incontinence and constipation.

13.2 Mechanism of Neuromodulation

The mechanisms of action of neurostimulation and neuromodulation for FI and constipation remain obscure. Stimulation of efferent nerves supplying the pelvic floor was thought to augment external sphincter function but anorectal physiological studies have shown equivocal results both for manometric and sensory testing. SNS has also been reported to affect both antegrade and retrograde motility in different segments of the colon, again with conflicting results reported in some trials. It not entirely clear how neurostimulation affects the symptoms of functional bowel disorders [2].

One of the interesting hypothesis is that SNS may modulate the afferent sensory pathway and/or spinal reflexes, thus changing the way the patient perceives rectal distension and faecal urgency. This has been shown in both animal and human studies using brain imaging and evoked potentials.

13.3 Sacral Nerve Stimulation (SNS)

13.3.1 Procedure

Sacral nerve stimulation is a two-staged procedure. The first part involves inserting a temporary testing wire, usually into the third sacral foramen and the wire is then attached to a temporary stimulator (see Fig. 13.1).

This part is often called the peripheral or percutaneous nerve evaluation (PNE). The patient ‘test drives’ the treatment for 2–3 weeks. During this period, the patient is encouraged to continue with their daily life as normally as possible. After the three-week trial period, efficacy is assessed using a bowel diary. According to the

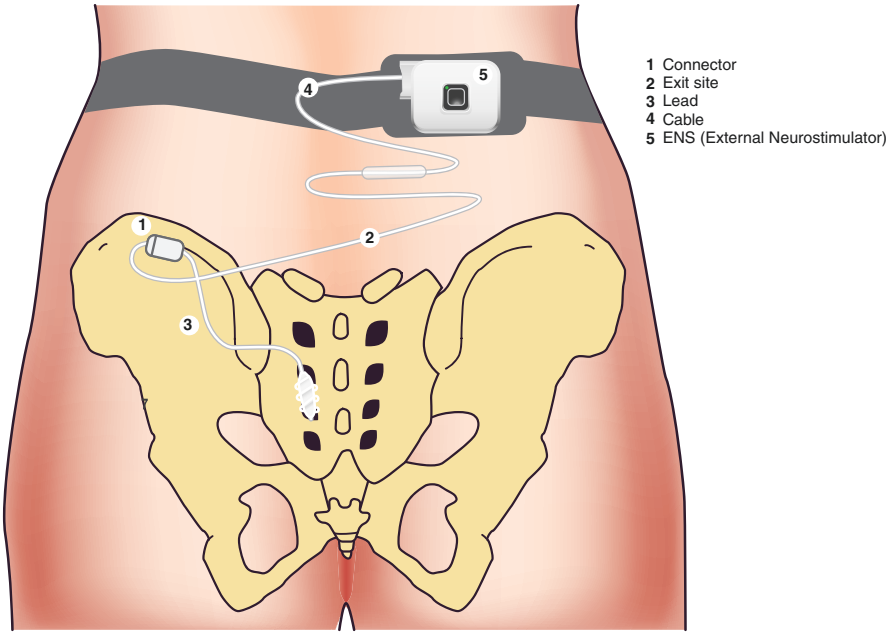

Fig. 13.1 Temporary or PNE phase of SNS

initial criteria used in trials, a 50 % or more improvement in symptoms is the threshold for progressing to a permanent implant, although many clinicians feel that a higher percentage of improvement is required.

If the patient is deemed to have had an adequate improvement, they proceed to implantation of a tined, self-anchoring lead and a stimulator (IPG: implantable pulse generator) (see Fig. 13.2).

The IPG is normally sited in the buttock and the patient will be given a handheld programmer so that they can adjust stimulation strength and switch between preset programs (a maximum four at a time).

Some surgeons perform the temporary wire insertion under local anaesthesia. Most surgeons would perform the second stage under general anaesthesia.

13.4 Outcome Assessment

Bowel diaries, used to assess primary outcome of the temporary testing phase of SNS, are only a sensitive and representative assessment tool when filled in correctly. The limitation of bowel diaries has been recognised over time. There are issues with compliance in filling in the details of bowel symptoms on daily basis for at least two weeks which can lead to poor quality of collected data.

The bowel diary continues to be used as a short-term assessment tool as the incontinence scores such as the St. Mark's and Wexner's incontinence scores are

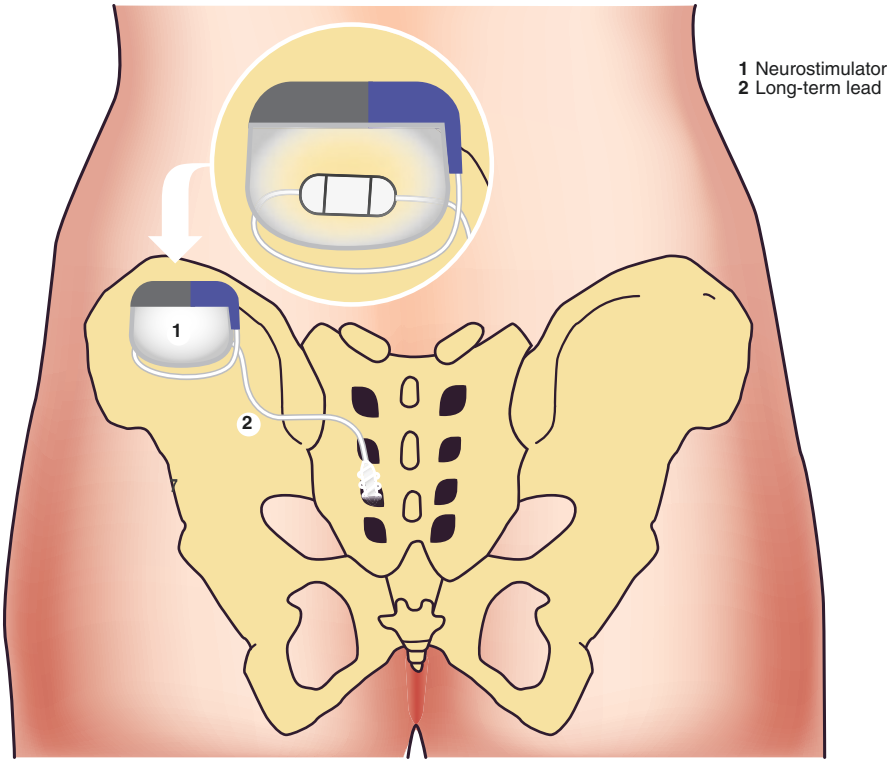

Fig. 13.2 Permanent SNS

judged over the previous four weeks and cannot therefore be used for a two to three week trial period.

PAC-QOL and PAC-SYM are validated constipation scoring systems which assess patient symptoms quality of life over the past 2 weeks. However, quality of life is unlikely to change within 2 weeks of the trial period. One of the components of the Wexner's constipation score asks about the duration of symptoms. The total score therefore deteriorates inherently with time and cannot therefore be used for studies into treatment efficacy. Scoring systems are more suited to the assessment of outcome with the permanent device and should be done with the bowel diary at baseline for historical comparison. Equally quality of life takes time to change and these scales should be used for longer term outcomes.

13.5 Function Over Time: FI

Some of the first studies on long-term outcome reported that 75–84 % of patients had a greater than 50 % improvement in symptoms based on bowel diaries [9, 10]. Matzel *et al*. reported improvement in the short-term was maintained in all patients who were available for follow-up at a median follow-up of 9.8 years [11]. Subsequent

studies have shown that the dramatic improvement of symptoms is sustained long-term in a proportion of patients who have been offered this treatment [3].

A careful interpretation of these data is needed. They report outcome on a selected group of patients who have continued with this therapy. An intention to treat analysis, starting with patients who are offered temporary testing has shown a decreased success rate of only 39–50 %. Of those patients who proceeded to permanent implantation, 55.6 % had a favorable outcome at 5 years [4].

It should also be noted that SNS improves but does not abolish incontinence symptoms in around 75 % of the patients [12]. This raises a question about the robustness of the traditional criterion of 50 % improvement of incontinence episodes. The value of 50 % was a simple adoption of criteria from a multicentre study of SNS for urinary incontinence and has never been challenged. The cut-off for the improvement of incontinence episodes required to avoid reduced efficacy over time was reported to be more than 90 % during temporary testing [13]. It is likely that the absolute reduction in number of incontinence episodes does not fully reflect the improvement in symptoms and may need to be used in conjunction with other assessments, such as disease specific quality of life, when evaluating the treatment outcome after definitive implantation.

13.6 SNS for Constipation

Constipation is a common functional bowel disorder affecting up to 30 % of the general population [14]. It is normally managed by a combination of conservative modalities such as dietary modification and laxatives. However, many patients remain refractory to conservative treatments while major surgery such as colectomy or the creation of a stoma is reserved for the most severe cases.

Ganio et al. first reported improvement of constipation in patients treated with SNS [8]. The patients had reduction in difficulty emptying the rectum and number of unsuccessful toilet visits. Since then a few other studies have emerged reporting that SNS may be efficacious for constipation refractory to conventional treatment [5, 7, 15]. Although these reports were encouraging, the number of patients was small with the success rate during the test period ranging from 25 % to 42 % which is relatively low compared to faecal incontinence [5, 7]. Follow-ups have also been short with no substantive data on suboptimal outcome and complications. The latest randomised controlled study of SNS for refractory slow constipation did not improve the frequency of complete bowel movements [16]. The use of SNS for constipation should be considered only for exceptional cases.

13.7 Loss of Efficacy

Up to half of patients lose efficacy at some point after permanent implantation [4]. The cause of this loss of efficacy during the course of treatment is not always well understood.

13.8 Early Failure of Permanent Implantation

One of the potential explanations for early failure after implantation is the inability to reproduce the temporary testing or PNE result after definitive implantation. This is an inherent problem when the test period is conducted with a temporary lead and a subsequent permanent electrode cannot be placed exactly in the same place as the temporary lead.

One-third of patients who proceed to definitive implantation with equivocal or incomplete bowel diaries during PNE but subjective improvement, have poor outcomes. Desperate patients may be over optimistic when filling in their bowel diaries and placebo effect cannot be ignored. Another possibility is difficulty in finding an ideal programme setting at the beginning of the permanent treatment. Although numerous combinations of electrode poles and amplitudes are possible, it can be challenging when the patient cannot feel the stimulation sensation exactly around the anus which is an indicator of correct stimulation site or when the sensation is uncomfortable or painful.

13.9 Late Failure of Permanent Implantation

There are various causes of secondary or late loss of efficacy. Mechanical factors relating to the device such as lead migration, a broken fibre within the lead, a loose connection or fibrosis around the electrode may occur. A lateral and AP sacral x-ray is warranted whenever there is a sudden change in symptomatic response or occurrence of an adverse event. The lateral film should be compared with the intraoperative film to rule out a lead displacement and/or breakage. Surgical interventions required to deal with other complications such as re-siting the stimulator for pain, necessary exchange of the stimulator due to battery depletion may also have influence on therapeutic efficacy.

It is possible that nerve damage can occur after prolonged stimulation and may account for gradual loss of efficacy due to neurophysiological mechanisms. Loss of efficacy after a period of successful treatment may also occur due to habituation of the central nervous system (CNS) which is a loss of response of the CNS despite of sustained evoked potentials [17].

13.10 Complications

13.10.1 Overview

A systematic literature review looked into postoperative issues relating to SNS and pooled data from 89 articles including 1661 patients [13]. The commonest problem during the PNE phase was lead displacement (5.3 %). The incidence of pain and infection after permanent implantation was 13.0 % and 3.9 %, respectively. However, the review identified limitations due to underreporting by some of the studies: 60 %

of the studies did not report complications during the PNE phase, and a suboptimal outcome after implantation was not disclosed in 44 % of the studies. The true incidence may therefore be higher.

13.10.2 Pain

Pain during therapy can be differentiated into mechanical, with the implanted device causing the pain, or functional due to adverse stimulation. A clinical examination should suffice to diagnose mechanical pain. If there is no obvious mechanical cause, the stimulator should be switched off, to make sure that the pain is not caused by the therapeutic electric current.

Pain is most commonly reported around the site of the implanted stimulator. Immediately after the operation the pain can be due to a haematoma or poor device positioning. Some patients who are thin or those who experienced a significant reduction in BMI after implantation may not have enough subcutaneous tissue to cover the device.

Pain around the device some days post-implantation may be due to infection.

Pain not related to the physical presence of the device may be due to certain amplitudes and/or wider electrode pole combinations resulting in pain in the perineum, leg or foot. Using higher amplitudes and/or wider bipolar or tripolar combinations can result in an increase in recruitment of smaller pain fibres across a broader stimulation field.

13.10.3 Infection

Bacterial colonization appears to occur with the use of temporary lead without clinically significant infections [18, 19]. Infection rates relating to the use of the permanent electrode during the PNE phase have been open to debate; one large cohort study showed that the use of permanent electrodes for the PNE increased the rate of infection [20], whilst a recent paper showed no increase in infection using the permanent lead for a prolonged test period [19]. At a recent European consensus meeting, no clinician had experience of any clinically relevant infection with a temporary lead PNE.

13.10.4 Other Complications

Complications associated with the device and surgical techniques such as skin erosion, cellulitis, seroma and wound dehiscence have been reported.

Functional adverse effects from stimulation have included constipation and urinary retention. These have rarely required deactivation during defaecation and urination respectively. Sleep disturbance requiring the device to be switched off at night and increased sexual drive have also been reported. There is also a single

report of a patient complaining of the sensation of minor electric shocks when passing through an ambient electric or magnetic field.

There is limited information on the effects of SNS on pregnancy as it is recommended that the device be switched off at this time [21, 22]. There have been reports of premature delivery, infants with Downs syndrome, chronic motor tic disorder and pilonidal sinus although the association of these with the use of SNS is unclear [6, 23, 24].

13.11 Management of Adverse Events

A basic check should be performed as to whether the system is operational or not, including the remaining capacity of the battery and ruling out accidental switch off or on of the stimulator. Additionally, a re-evaluation of the patient's familiarity with the programmer can prove useful. Rarely, the patient may have inadvertently or deliberately rotated the device; a variant of 'twiddler's syndrome' described with cardiac pacemakers.

Impedance is an indicator of an electrical system disruption. High impedance (>4000 ohms) is suggestive of an open circuit which may be due to lead breakage, a disconnection or a loose screw. Low impedance (<50 ohms) is indicative of a short circuit which can occur as a result of a tight connection or body fluid intrusion into a connection. Impedance should be carefully evaluated by testing every unipolar mode and in some cases using a higher pulse width and/or higher amplitude it can normalise with these settings. Surgical revision should not be considered for an abnormal impedance alone if the patient still has sensory perception and/or a good symptomatic response.

13.12 Re-programming

Re-programming is normally the first step in the management of a lack or loss of efficacy and for pain without an obvious mechanical cause. This usually involves changing the stimulation parameters (electrode pole combinations and amplitude). As yet, there is no consensus on a standard way to perform reprogramming but it is advisable to do this procedure systematically. For example, sensation from stimulation should be tested first by unipolar mode (4 combinations), then bipolar mode (12 combinations) to identify the best combination with which the patient does not feel any uncomfortable sensation while having sensation around the anus. If no ideal combination is found, a tripolar combination can be attempted. Pulse width and frequency can be altered but there is a lack of guidance on how they should be changed. There is a difference in behaviour between different nerve fibre types and a shorter pulse width creates more leeway to differentiate sensory, motor and pain thresholds and is perceived as more comfortable than longer duration pulses. The change of pulse width and/or frequency as an alternative programming should be performed systematically and carefully assessed for clinical benefit. In cases of implant site pain due to the stimulation, reprogramming from unipolar to bipolar maybe useful as with unipolar settings the stimulator acts as one of the electrical

poles. If a change of efficacy is related to minimal lead migration (less than a centimetre) and efficacy can be sustained using different polar combinations which are better positioned around the sacral root, this option should be considered as first line management. If all the programming possibilities have been exhausted, revisional surgery could be considered.

13.13 Revisional Surgery

Revisional surgery is used when there is a deep infection or an overt mechanical problem with the device such as a lead breakage or displacement of the implantable pulse generator.

Surgical intervention should also be considered as a treatment for pain around the stimulator site which does not respond to switching the device off. Placing the stimulator in a deeper but snug subcutaneous pocket avoids external bulging and prevents mobility of the stimulator. The stimulator can be resited in the contralateral buttock. Buttock placement has been reported to have less complications and lower reoperation rates compared to abdominal placement. The latest InterStim II™ is much smaller in size than its predecessor and is less problematic.

In rare cases where protrusion of a permanent lead is the cause of pain, bone-anchoring or fascial anchoring of the lead should be considered.

Posterior lead migration requires re-implantation of the lead as the lead cannot be advanced. Anterior migration of the lead could theoretically be dealt with by pulling back the lead. However, there is no instrument that a surgeon can use intra-operatively to check for any mechanical damage to the lead and it is therefore recommended that a new lead is implanted. The lead can be reinforced with a suture to the lumbosacral fascia for patients with a history of lead migration and in those who have an inherent tissue weakness or atrophy that may lead to migration. This may also be applicable to a patient whose body mass index is low (<19) as such patients may not have an adequate depth of surrounding muscle and subcutaneous tissue for the lead to anchor itself.

13.14 Management of Infection

In cases of suspected infection such as redness around the wound and discharge, antibiotics (orally or parenterally) can be given as a first step which should cover some superficial Staphylococcal infections. Unresolved infection requires device removal. Re-implantation should only be done after an interval of at least 3 months.

13.15 Other Issues Relating to Therapy

The mechanisms of a change of urinary function, sexual drive, and effect of SNS on pregnancy are not well understood. Any adverse or untoward event which may be related to stimulation should be dealt with by discontinuing the therapy to assess the

course of the untoward event. Women of reproductive age should be counselled prior to implantation that SNS should be stopped as soon as they become aware of pregnancy.

13.16 Percutaneous Posterior Tibial Nerve Stimulation (PTNS)

The use of PTNS evolved after the reports of its success for urinary incontinence. The posterior tibial nerve is a branch of the sciatic nerve which originates from the sacral nerve roots L3-S4 and in theory the stimulation of this nerve can modulate the same afferent nerve pathway targeted by sacral nerve stimulation.

The procedure is relatively simple and done at an outpatient setting. A thin acupuncture type needle is inserted into the posterior tibial nerve which is found just above the medial malleolus in the ankle (see Fig. 13.3).

The needle insertion rarely causes any pain or bleeding. A surface grounding pad is applied to the heel and low-voltage stimulation is applied to the needle, just below the level when it produces motor (plantar and/or toe flexion) and/or sensory (tingling ankle, foot or toes) responses. The patient will typically receive a 30-min session on weekly basis for 12 weeks.

There are a number of studies reporting improvement of symptoms of faecal incontinence and constipation. It appears that PTNS is as good as SNS in the

Fig. 13.3 Percutaneous tibial nerve stimulation (PTNS)

short-term [25, 26]. Long-term efficacy is so far unproven and may require, top-up sessions although the intensity and frequency of these remains unknown [27].

Conclusion

Sacral nerve stimulation has been advocated as a minimally invasive and safe treatment for faecal incontinence due to its relatively simple surgical procedure and absence of life-threatening adverse effects. It undoubtedly brings a remarkable improvement of symptoms to some patients whose quality of life has been diminished by faecal incontinence.

Although the operative procedure is straightforward, treatment maintenance can be work intensive. Patients should be counselled and informed that SNS requires ongoing hospital attendances. Some patients may need frequent reprogramming of stimulation parameters to optimise efficacy whilst complications such as pain and infection due to the implanted device can require surgical intervention. Currently the battery of the implanted stimulator is not rechargeable and requires re-implantation when the battery is depleted.

Currently, there is no strong evidence to recommend SNS for constipation.

In the field of urology where SNS was pioneered, there have been a few substantial reports emerging on loss of efficacy and adverse events. The latest and largest report of a worldwide multicentre study on urinary voiding dysfunction with more than 150 stimulator implantations had 67 % of patients experiencing at least one adverse event with 39 % requiring revisional surgery and 10 % eventual device removals [28]. It appears therefore, that the number of adverse events of SNS for faecal incontinence and constipation is generally comparable with these data.

The reports on the outcome of other peripheral nerve stimulation are predominantly case series only. A report on a large randomised controlled study of PTNS for faecal incontinence showed PTNS is no better than placebo.

The delivery of neuromodulation service is possible only at a unit where all the other options of treatments for FI and constipation are available. PTNS can be included in nurse-led conservative therapies for faecal incontinence. SNS may be a relatively straight forward procedure, but it is expensive and it should only be considered after conservative options have been exhausted, and each patient has been discussed by a multidisciplinary team of colorectal surgeons, specialist nurses, physiotherapists, psychologists and urogynaecologists regarding the appropriateness of the treatment.

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Surgery

14

The Surgical Management of Faecal Incontinence and Constipation

Gregory Thomas and Carolynne Vaizey

14.1 Faecal Incontinence

14.1.1 Introduction

Faecal incontinence (FI) is common. It occurs in 2–20 % of the adult population in the western world [1–4]. It is often under reported, usually due to patient reticence to seek help. It most commonly affects women over 65 years of age [2]. It causes considerable morbidity and reduces quality of life [5].

Broadly speaking, it may be caused by either increased forced of expulsion of faeces or by an impaired ability to retain them. The former may be due to inflammation or irritability of the rectum or to loss of rectal or neo-rectal capacity. Failure to retain faeces may be due to motor or sensory impairment of the anorectal sphincter mechanism [5]. In many patients both factors are present. The main causes are summarised in Table 14.1.

14.1.1.1 Treatment Strategy

As a general rule, conservative treatment should be offered initially. More invasive treatment is reserved for those who fail conservative therapy. Neuromodulatory therapies are described elsewhere in this book. An overview of a suggested treatment pathway is shown in Fig. 14.1.

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Table 14.1 Summary of the main causes of faecal incontinence

Colorectal disease	Anal sphincter weakness
Inflammatory (enteritis, colitis, proctitis)	Intact sphincter Functional weakness Age, neurological disorder, myopathy, radiotherapy
Irritable bowel syndrome	Ruptured sphincter Obstetric, anal surgery, trauma
Reduced rectal capacity (post rectal resection, radiotherapy)	Rectal fistula to vagina or perineum
Congenital anomaly	Physiological activation of the anorectal inhibitory reflex in faecal impaction

It is worth noting that if a full thickness rectal prolapse is found, this should be corrected before any other treatment is commenced. This can only be done surgically. This may be achieved by a perineal or abdominal approach. The most common perineal approach is the Delorme's procedure; in some cases an Altmeier's procedure is appropriate. The Delorme's procedure involves resection of the prolapsed rectal mucosa and plication of the remaining muscular wall. The Altmeier's procedure is the transanal resection of the prolapsed rectum. All abdominal procedures require fixation of rectum to the sacral promontory, this is known as a rectopexy. This may be performed either at laparotomy or by laparoscopic techniques. It was thought that a recurrence is less likely from a rectopexy than from a Delorme's operation. However the two techniques were compared by the PROSPER trial and this showed no significant difference in recurrence rate (20 % vs 26 % p = 0.8) [6]. A rectopexy is a more invasive operation, with a greater potential for significant complications. However, the application of laparoscopic surgery has gone someway to making this a safer operation.

Injectable Anal Bulking Agents

Anal bulking agents are prosthetic materials implanted into the intersphincteric space. The aim is to increase the bulk of the sphincter complex.

This is thought to be particularly effective in those with passive incontinence secondary to internal anal sphincter weakness or deficiency. The first report of an injectable bulking agent to treat faecal incontinence was published in 1993 [7]. This used a Teflon-like material. Since then many different materials have been studied. Although the initial reports were promising, a Cochrane review has shown the results to be disappointing, mostly due to poor efficacy and safety [8]. The short term results of a new bulking agent, the Anal Gatekeeper, have recently been reported [9]. This consisted of an implantable cylinder of polyacrylonitrile, implanted into the intersphincteric space. Episodes of passive incontinence improved from 7.1 (7.4) per week at baseline to 0.4 (0.6) per week at 33.5 (12.4) months mean follow up. Clinical improvement correlated with improved quality of life. No adverse effects were reported, but the study was small (n = 14). Larger studies are currently under way.

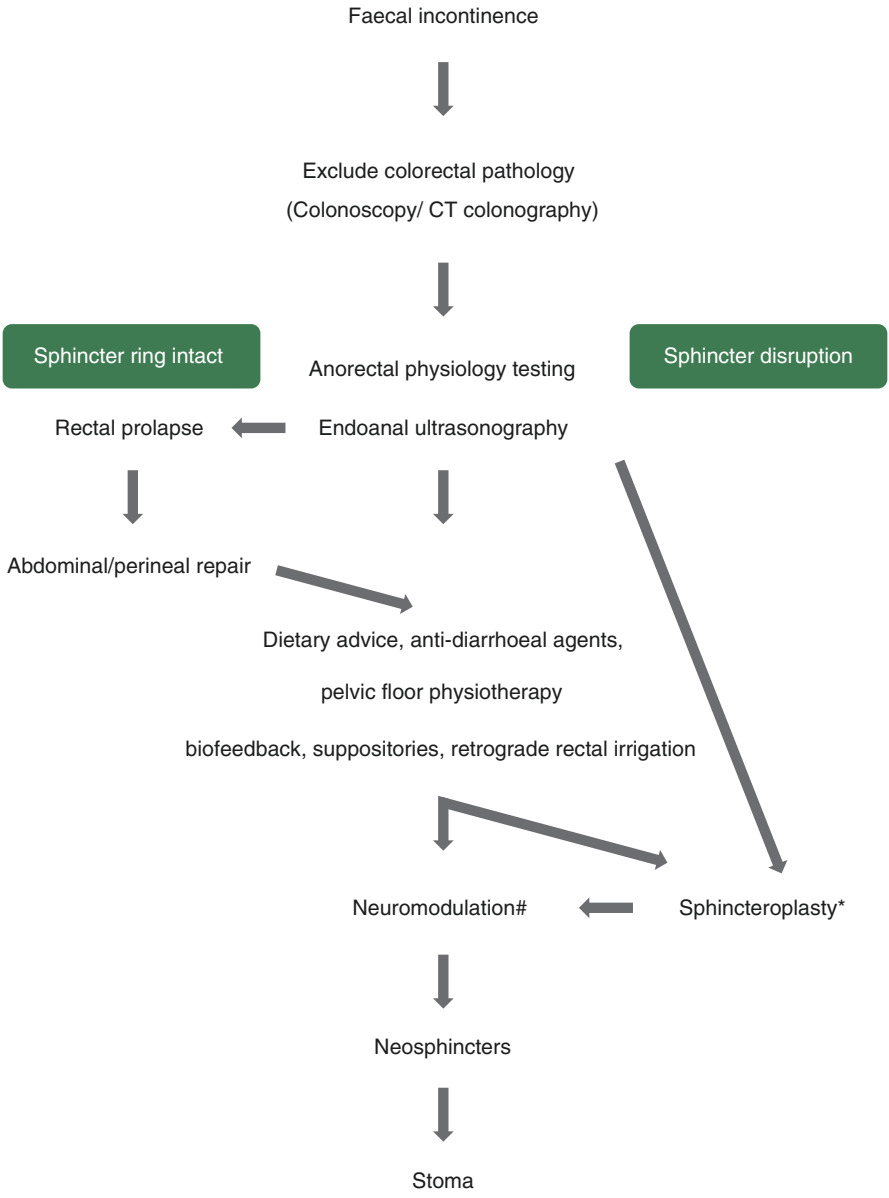

Fig. 14.1 Suggested treatment pathway for management of FI

Radiofrequency Ablation (SECCA)

The SECCA system (Curon Medical Inc, Sunnyvale, CA, USA) works by delivering radiofrequency energy to the internal anal sphincter to induce fibrosis to cause anal canal closure by contraction of collagen (see Fig. 14.2).

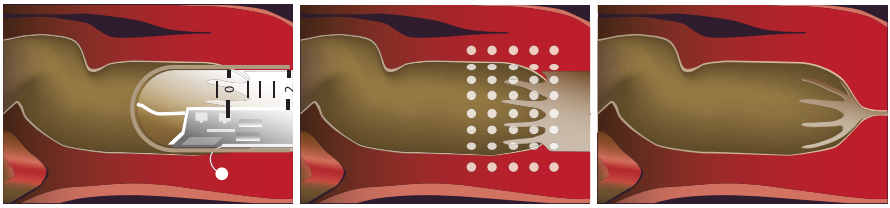

Fig. 14.2 Radiofrequency ablation (secca)

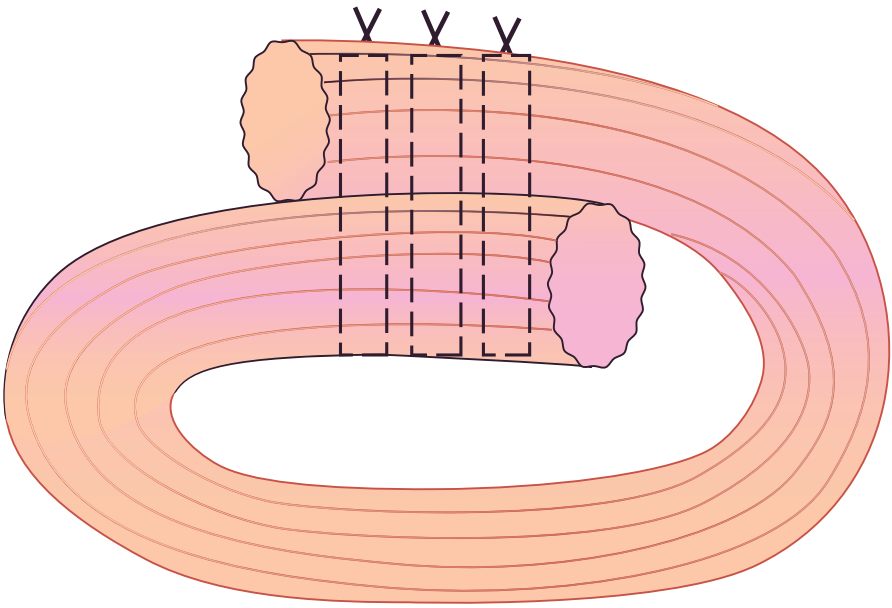

Fig. 14.3 Anal sphincteroplasty

It is used for passive FI in which internal sphincter weakness predominates. It is a day case procedure and can be performed under local anaesthesia with sedation. In 2002 Takahsahi et al [10] reported its use in ten patients with idiopathic FI. At 6 months a significant improvement in the Wexner FI score was seen (13.5–5). Less impressive improvements in the Wexner FI score were reported by Efron in 2003 [11], Lefebure in 2008 [12] and Ruiz in 2010 [13] (14.5–11.1, 14.07–12.33 and 15.6–12.9 respectively). Most patients remained moderately incontinent after treatment and it appears that SECCA gives only a marginal benefit.

Anal Sphincteroplasty

Overlapping sphincter repair can be the operation of choice for most patients with a full length external anal sphincter defect and good residual muscle function (see Fig. 14.4).

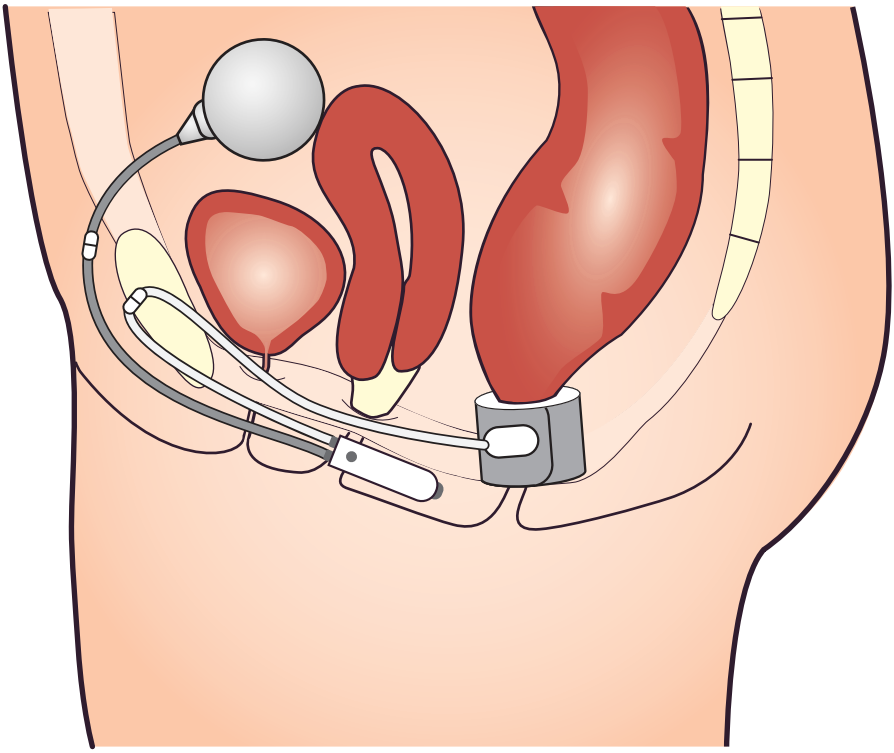

Fig. 14.4 Artificial anal sphincter

Enthusiasm for this procedure has declined in recent years. This is due in part to the emergence of neuromodulation as a safer alternative treatment. It is also due to a series of reports which cast doubt on the long term effectiveness of this procedure. In 2000, Malouf reported the outcome of 38 patients who had undergone a sphincter repair. None were continent, 20 still wore a pad. Despite this, 23 still reported an improvement of 50 % or more at five years [14]. In a recent systematic review of the long term outcome of 900 patients at five or more years [15], the authors found marked differences in the criteria adopted among the studies to define incontinence. There was however an initial improvement in most studies followed by a gradual deterioration over time. This deterioration did not however, correlate with quality of life or patient satisfaction. No consistent predictive factors for failure were identified.

Artificial Anal Sphincter Prostheses

AMS 800 and Acticon Neosphincter

The use of an artificial anal sphincter for FI was first reported in 1987 [16]. This utilized the AMS 800 device, which had originally been devised for urinary

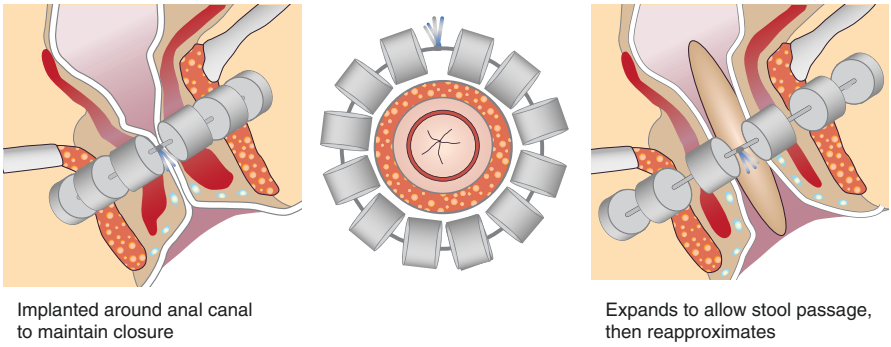

Fig. 14.5 Magnetic anal sphincter

incontinence. Many reports have further described its efficacy [17–23] and subsequently the device being applied to the anus was modified and renamed the Acticon neosphincter. The device consists of an inflated cuff which encircles the sphincter complex. This is connected to a hydraulic system whereby deflation of the cuff is effected by a pump located in the labia majora or scrotum when defecation is desired (see Fig. 14.5).

A systematic review [24] of 14 reports found a very high incidence of device removal mostly due to erosion, infection or mechanical failure. Few reports analysed the data on an intention to treat basis, but patients who continued to have a functioning implant experienced a significant improvement in symptoms. These results were reflected by a recent report describing 52 patients, who had been implanted with the Acticon device over a 14 year period [25]. At a mean follow up of 64.3 ± 46.5 months, 26 % had had the device removed owing to infection in most cases and 24 % underwent revision due to device failure. Of the patients left with a functioning device, 67.3 % had a significant improvement in the Wexner faecal incontinence score and in quality of life.

The Prosthetic Anal Sphincter

The prosthetic anal sphincter (PAS), was reported in 2004 [26]. This expandable device is placed at the anorectal junction, and acts to accentuate the effect of puborectalis, by narrowing the angle between the rectum and anus. The PAS can be controlled by the patient, to allow the anorectal angle to straighten when defecation is desired. In a report of 12 patients at a median follow up of 59 (30–72) months, ten became continent. The Wexner faecal incontinence score improved from 16 (7–20) at baseline to 3 (0–7). Two devices were removed due to infection following revisional surgery. Despite this, the reported improvement in symptoms is encouraging.

The Magnetic Anal Sphincter

The magnetic anal sphincter is a recent development. It includes a flexible ring of magnetic titanium beads which is inserted around the anal canal in a similar manner to its use for gastro-oesophageal reflux (see Fig. 14.6).

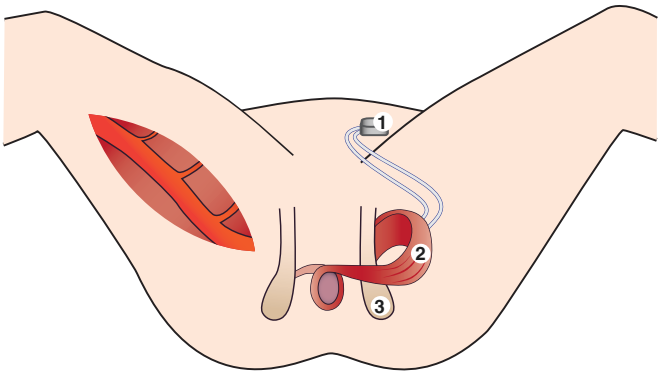

Fig. 14.6 Graciloplasty

The beads come together by magnetism to close the anus and the pressure exerted by voluntary defecation separates them to allow defecation. In a preliminary report of 14 patients [27], three had the device removed and at a median follow up of six months, five of the remaining patients had a significant reduction in incontinent episodes from 7.2 at baseline to 0.7 with a significant improvement in quality of life.

A small non-randomised study indirectly compared the outcome of the magnetic anal sphincter (n = 10) with the Acticon device (n = 10) [28]. Four of the latter were revised and two were removed owing to infection. One of the former spontaneously eroded. Overall a significant reduction in the Wexner faecal incontinence score was seen in both groups. Sacral nerve stimulation was compared with the magnetic anal sphincter in a similar fashion [29]. Both therapies achieved a significant reduction in episodes of incontinence and improvements in quality of life. In both studies, it is likely that multiple reporting of the same patients had taken place. These studies were non-randomised and small, therefore it is difficult to draw any firm conclusions. Larger, truly prospective randomised trials are needed to determine the efficacy and safety of the magnetic anal sphincter.

Graciloplasty

Non-stimulated graciloplasty was first described in 1952 [30]. The gracilis muscle derives its blood supply proximally, so can be divided distally without compromising viability. The muscle is mobilised to encircle the anus (see Fig. 14.7).

The results were disappointing initially. Stimulation of the nerve supplying the gracilis muscle, dynamic graciloplasty, was described in 1988 [31]. High frequency stimulation by an implantable pulse generator, converts the fast twitch fibres of the gracilis to fatigue resistant slow twitch activity. This has lead to an improved outcome, with up to 60 % of patients reported to have improved function in some studies [32], although others have been less successful [33] The procedure is rarely employed as it is associated with high complication and reoperation rates with the former occurring in up to two thirds of patients [34].

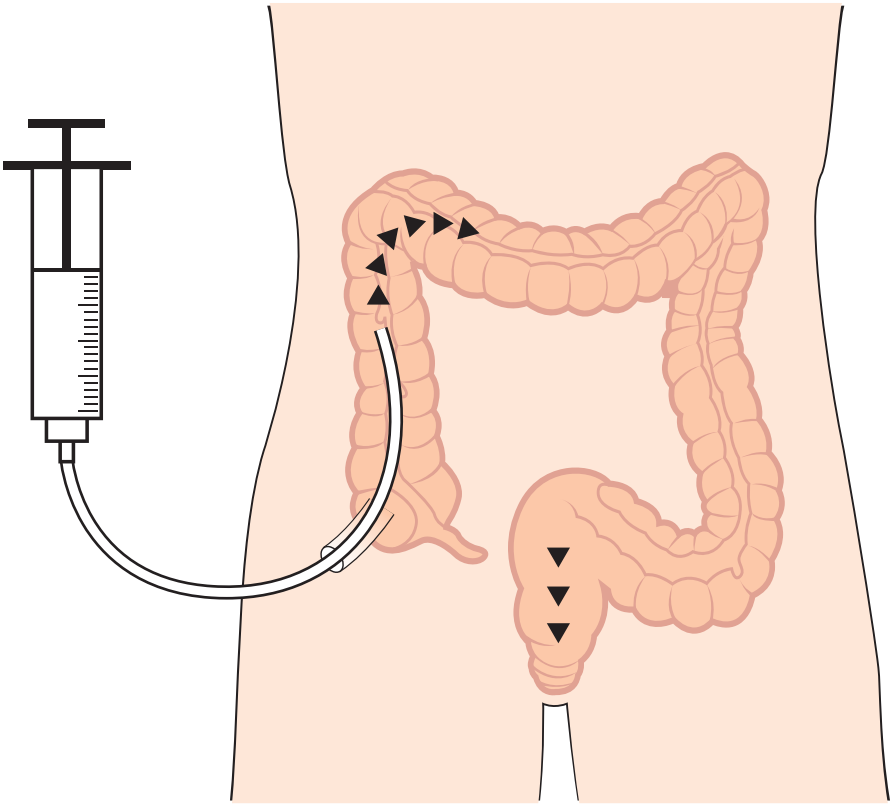

Fig. 14.7 Antegrade continence enema

Antegrade Colonic Enema

First reported by Malone in 1990 [35], this utilised a Mitrofanoff valve to produce a catheterisable continent colonic stoma to permit antegrade colonic irrigation (see Fig. 14.8) [36].

Worsoe and colleagues [37] reported 80 patients who had undergone an antegrade colonic enema, 69 of whom used an appendicostomy. At a median follow up of 75 months, 38 % had had complications related to the appendicostomy and success was reported in 51 (74 %). Chereau et al. [38] reported a similar outcome. Seventy five patients underwent this procedure, 68 of whom had an appendicostomy. Complications occurred in 16 (21 %). At a median follow up of 48 months, 64 were still using the stoma, and of these 55 (86 %) had a satisfactory outcome with a fall in the Wexner score from 14.3 (±2.9) to 3.4 (±2.4).

Stoma

When other treatments fail, a stoma may be the best means of management. It can bring relief with improved quality of life to a patient for whom other

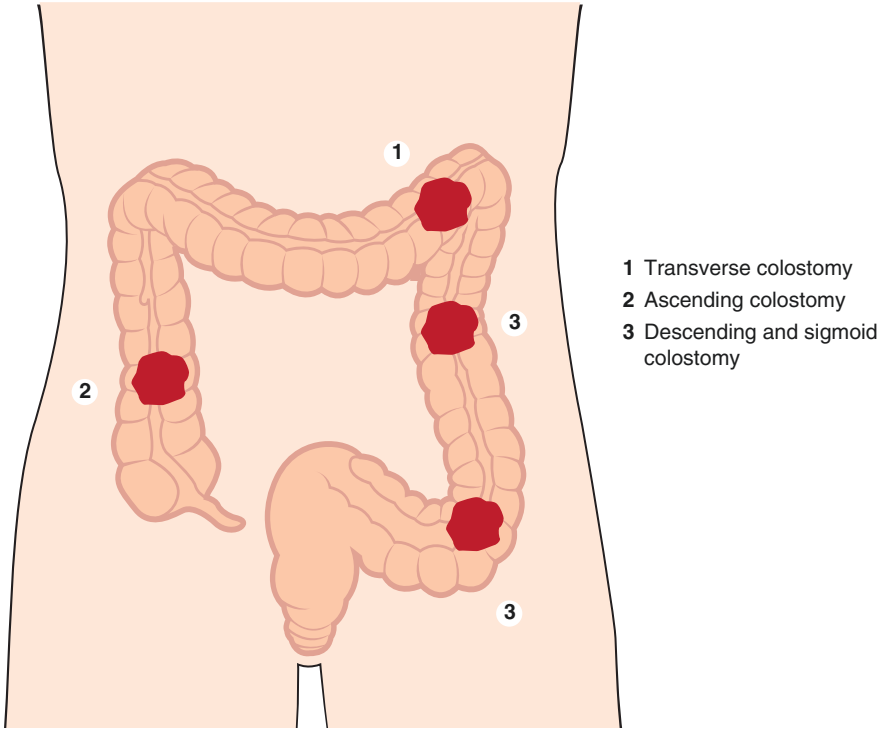

Fig. 14.8 Types of colostomy

treatments are not adequate. Faecal diversion can be either by ileostomy or colostomy (see Fig. 14.9).

Patients who have a stoma after more conservative failed attempts to improve incontinence may be very satisfied with the result [39]. Anal leakage of mucus from the rectum may continue to be troublesome however and occasionally it may be necessary to perform rectal excision after a stoma for incontinence. Stoma related complications, including herniation, prolapse and retraction are common, particularly in an elderly patient.

14.2 Overview of the Treatment of Constipation

14.2.1 Introduction

It has been estimated that, worldwide, around 14 % of adults suffer from constipation. The incidence is higher in older patients, in females and in those of lower socioeconomic status [40].

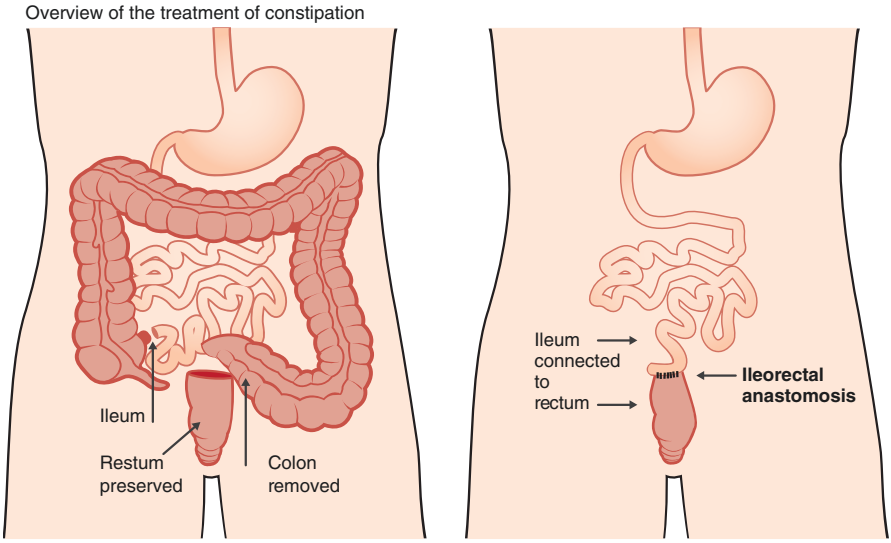

Fig. 14.9 Subtotal colectomy with ileorectal anastomosis

The pathogenesis of constipation can be broadly subdivided into two categories – disorders of colonic motility and evacuatory dysfunction, with a degree of overlap in many patients [42]. Various factors may be responsible for delayed colonic motility, these include immobility, age, medication, endocrine, psychological, aganglionosis and pseudo-obstruction. Evacuatory dysfunction may be due to a mechanical cause, such as rectal intussusception, rectal prolapse, rectocele or enterocele. It may also be due to functional causes such as anismus or dyssynergia, descending perineum syndrome or spinal injury. In many patients, both mechanical and functional elements will co-exist.

14.2.2 Treatment

Medical treatment includes dietary advice, drug treatment (laxatives, enemas, suppositories) and biofeedback [41]. A paper in 2015 from the American Neurogastroenterology and Mobility Society and the European Society of Neurogastroenterology and Motility reviewed the published evidence regarding the use of biofeedback for constipation. Based on the strength of evidence, biofeedback therapy is recommended for the short-term and long-term treatment of constipation with dyssynergic defecation (Level I, Grade A), and for the treatment of fecal incontinence (Level II, Grade B). Biofeedback therapy may be useful in the short-term treatment of Levator Ani Syndrome with dyssynergic defecation (Level II, Grade B), and solitary rectal ulcer syndrome with dyssynergic

defecation (Level III, Grade C), but the evidence is slim. Evidence does not support the use of biofeedback for the treatment of childhood constipation (Level 1, Grade D) [43].

A flow diagram of the treatment for constipation is shown in Fig. 4.11. Neuromodulation is usually offered if a patient fails to improve following conservative measures. This is discussed in more detail elsewhere in this book. It was initially reported to be helpful in about two thirds of patients selected for this treatment and in these the abdominal symptoms of distension and discomfort may also be relieved [44]. However, recent work has cast doubt on its effectiveness as a treatment for slow transit constipation. A double blind placebo controlled two phase cross over study compared supra-sensory, sub-sensory and sham stimulation. The authors reported no advantage over sham stimulation [45].

Surgery has a role in a few carefully selected cases if conservative treatment fails and the patient is still severely symptomatic. In those with slow transit constipation, an antegrade continence enema procedure (ACE) or colectomy with or without stoma formation has been advocated [42]. While often successful in childhood, the ACE procedure in adults is associated with a high complication rate, up to 88 % re-operation rate and a 48–59 % failure rate through dropouts in the medium term.

A subtotal colectomy may be performed (see Fig. 14.10).

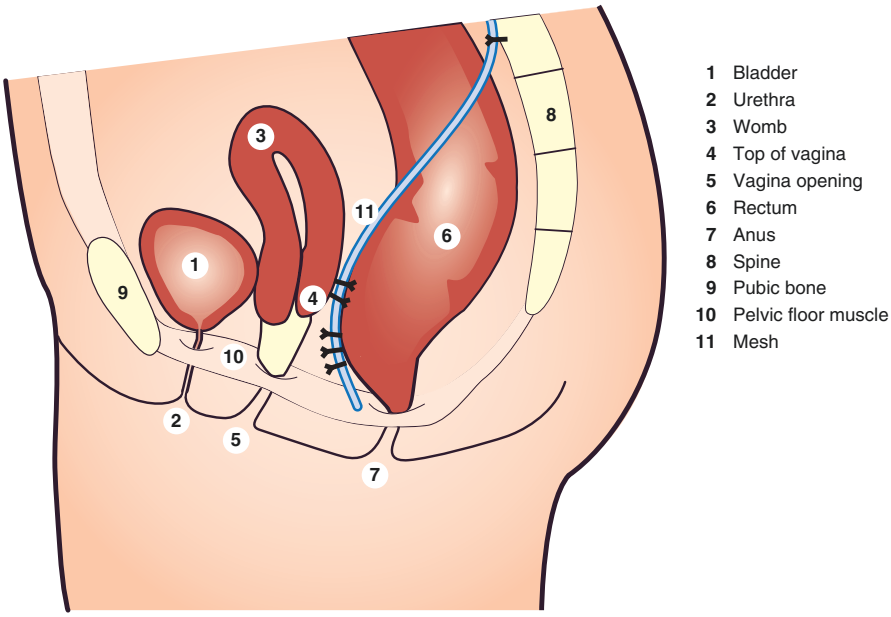

Fig. 14.10 Ventral mesh rectopexy

This may result in either an end ileostomy or the restoration of intestinal continuity with an ileo-rectal anastomosis. The use of this operation has declined in recent years due to numerous reports of adverse outcomes. It is important that the patient is made aware that although there may be an increase in frequency of defection, abdominal pain and bloating may persist. Symptoms of abdominal pain may persist in 41 % of patients. This perhaps reflects the pan-enteric motility disorder that exists in many subjects. Following colectomy, 14 % of patients develop diarrhoea and/or faecal incontinence and 18 % adhesional small bowel obstruction [46].

For patients with rectal hyposensitivity or pelvic floor dyssynergia, abdominal or perineal surgery is not an option. For those with mechanical dysfunction and symptoms of evacuatory dysfunction, operations may be divided into "hitching" procedures (e.g. rectopexy) or "excision" procedures (e.g. stapled transanal rectal resection).

There are two important points to bear in mind when considering surgery for such patients. Firstly, both functional and mechanical deficiencies may coexist to varying degrees. In such patients, correction of the pelvic floor and rectal anatomy may not always improve symptoms. Secondly, a significant number of asymptomatic patients will have a rectocele or an intussusception. A report by Palit and colleagues found the incidence of rectocele to be 93 % (26/28 healthy patients) and intussusception to be 20 % (9/46 healthy patients) [47].

A symptomatic rectocele may be repaired by a transanal, transperineal, transvaginal or transabdominal approach. These techniques employ either suture plication of the rectovaginal septum, mesh reinforcement, resection of the redundant tissue or reinforcement of the pelvic floor musculature. The reported results are varied, and there are no large studies to compare directly these techniques. The ventral mesh rectopexy has been reported for the treatment of rectoceles.

A report by Wong et al described significant improvements in symptoms of obstructed defecation in a study of 84 patients with a symptomatic large rectocele [48]. Transanal stapling devices, such as STARR or Transstar, have been used for symptomatic rectoceles. Rectal intussusception may be repaired by either a rectopexy or transanal resection using one of the stapling devices mentioned above. The rectopexy may be combined with a colpopexy in those with inadequate support of the vaginal vault.

Careful patient selection is important when considering surgery for such patients. Recent concerns about mesh erosion and its subsequent morbidity, have meant that many will not consider mesh rectopexy for those in whom the outcome of surgery is uncertain. Initial enthusiasm for the transanal stapling devices has been dampened by reports of persistent pain, pelvic sepsis, and urgency (reported in 7.1 %, 4.4 % and 20 % [49].

A defunctioning colostomy is an alternative for those with refractory evacuatory dysfunction. A proposed treatment algorithm is shown in Fig. 14.11.

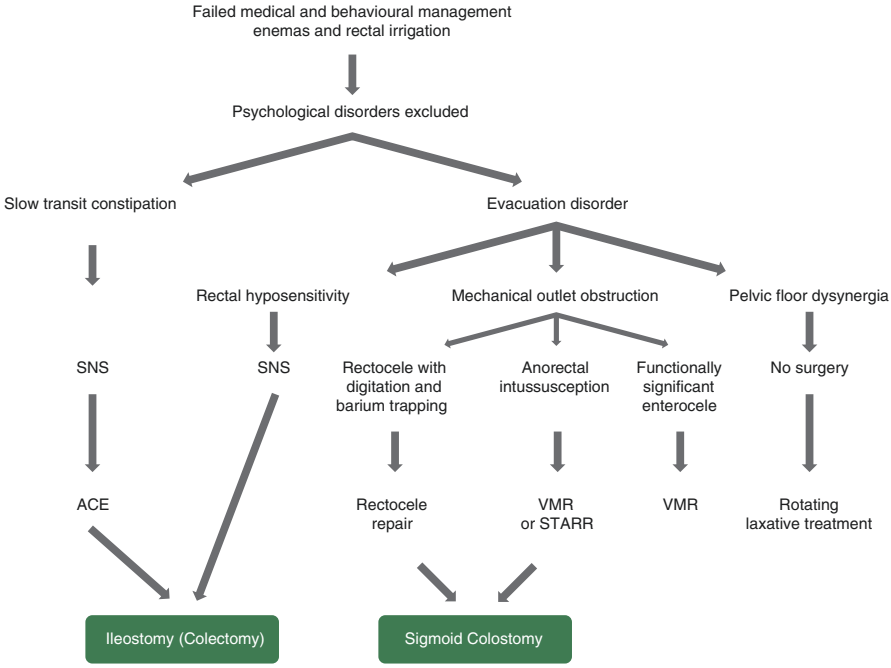

Fig. 14.11 Proposed treatment pathway for the management of constipation

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Psychological Medicine for Bowel Dysfunction

15

Yoram Inspector and Avril Burns

Thousands of years before a scientific evidence for the existence of the Brain-Gut Axis has been found, human beings already knew through their visceral experience that their psyche is hardwired to their gut. Look at the face of Humbaba (Fig. 15.1), the guardian of the holy cider forest in the Epic of Gilgamesh-the oldest myth known to man (1,000 years older than the Odyssey of Homer) [1] and you'll see that his head and his intestines are one labyrinth like unit. In the Old Testament Psalms, King David expresses his agony and remorse through his body and it all concentrates at the end in the centre of his gut:

> I am poured out like water and my bones are out of joint, my heart is like wax, it melted into the midst of my bowels [2].

Nothing has changed since biblical times: Our twenty-first century language still demonstrates the knowledge about the inseparable connection between our deepest emotions and the gut:

We are still "gutted" by psychological traumas that we "cannot digest ", that makes our "stomach to be knotted with fear". It is also in the same stomach where we continue to feel the "butterflies" of excitement or love. Psyche- the goddess of the soul in Greek mythology was depicted in ancient mosaics as a Butterfly winged woman in the company of her husband Eros; so when we feel Butterflies in our stomach we actually feel our Psyche (soul, life) in our stomach.

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Fig. 15.1 Humbaba

Our knowledge about the central and the autonomic nervous system and it's interlinks with our gut is increasing. We are discovering more and more facts on how our gut with all its useful good bacteria (Lactobacillus Rhamnosus JB-1 improves motivation and reduces stress in mice [3]) cooperates in return with our brain and helps it for example through the "Gut Feeling" to make the right moral decisions [3]; But all this scientific information still leaves us with a strong sense of mystery and wonder regarding how come that the Butterfly wings of Psyche find themselves in the "midst of the bowels ".

Carl Gustav Jung, the Swiss Psychiatrist (1875–1961) who understood Psyche as " the totality of psychic processes, conscious as well as unconscious" [4] addressed exactly this point when he wondered 90 years ago about the mystery of the special interrelationship between the psyche and the body:

> Mind and body are presumably a pair of opposites and as such, the expression of a single entity whose essential nature is not knowable either from its outward, material manifestation or from inner direct perception. According to an ancient belief, man arose from coming together of soul and body. It would probably more correct to speak of an unknowable living being, concerning the ultimate nature of which nothing can be said except that it vaguely expresses the quintessence of "life ". This living being appears outwardly as the material body but inwardly as a series of images of the vital activities taking place within it. They are two sides of the same coin, and we cannot rid ourselves of the doubt that perhaps this whole separation of mind and body may finally prove to be merely a device of reason for the purpose of conscious discrimination – an intellectually necessary separation of one and the same fact into two aspects to which we then illegitimately attribute an independent existence.
>
> Science has never been able to grasp the riddle of life either in organic matter or in the mysterious trains of mental imagery…Any one who knows the abysses of physiology will become dizzy by the thoughts of them, just as anyone who knows the psyche will be staggered by the thought that this amazing mirror-thing should ever attain anything approaching "knowledge". (Jung 1972; 619) [5]

Whilst working with our patients we always try to keep this unity in mind and not to divide the psyche from the gut. We try not to know beforehand what is going on and listen very carefully to the patient's story and fully embrace the physical suffering, pain and discomfort that she/he experiences.

The Psychotherapist /Councillor who works in St Mark's Hospital needs in our view to be humble in front of the bodily reality of his patient's gastrointestinal diseases or disorders.

She/He needs to be extremely careful not to assume that just because a clear physical pathology hasn't been found yet that "it is in the patient's mind" or that the patient is "somatising" (this is not an uncommon occurrence unfortunately).

There is always the danger of diverting the patient into the psychological realm and ignoring and missing a physical pathology.

A chilling example for such a dangerous psychologically biased inflated attitude can be found in the following case history. It relates to a patient of the "father of psychoanalysis" Dr Sigmund Freud himself:

> …a little girl was sent to him (to Freud) suffering from abdominal pains. He diagnosed her as an 'unmistakable' case of hysteria and 'cured' her with psychoanalysis. Two months after he discharged her, she died! the cause being abdominal lymphoma. Apparently unabashed, Freud denied all culpability, insisting that he had cured the hysteria which he declared: "has used the tumour as a provoking cause"…clinical arrogance of such degree of magnitude was ill – designed to protect him against the kind of missed physical diagnosis of which all psychotherapists live in dread [6]

In his typical hubris Freud also claimed to cure his famous patient Sergei Pankejeff, the "Wolf–Man" from his chronic constipation. The reality of the poor patient though, was totally different:

"Freud reduced Pankejeff's intestinal problems and persistent constipation to his desire to be penetrated by his father, as his mother had been during the primal scene" (Freud described how the origin of his patient neurosis stemmed from seeing his parents in bed, which the patient himself by the way denied seeing! and there is enough evidence today to suspect that Freud actually fabricated some core facts of the case in order to prove his theory…).

As far for Pankejeff, he had a much more prosaic explanation (for his chronic constipation, that unfortunately was not cured…), which he couldn't have neglected to share with Freud at the time:

> I once (before the analysis) had diarrhoea, and Dr Drosnes came to the estate…He takes a little bottle wrapped in paper from his pocket and says, 'That is calomel' he pours some into a cup and says, 'Take it.' The result was that it got worse. And he says, "I didn't give you enough"…Later a general practitioner told me that it (calomel) is only given to horses, not humans. I am telling you that what happened was that I couldn't eat anything all winter long… It was terrible. All the mucus membranes were torn and as a consequence I developed a constipation that nothing could be done with…And that stayed with me to the present day:
>
> My intestines don't work by themselves. I have to take something twice a week, but I have pains. It is terrible what this man did. Before everything worked perfectly [7].

Therefore, in order not to repeat such crucial "Freudian mistakes" we make sure that we will receive a very detailed medical and gastroenterological history before we start the psychological treatment. We also liaise closely with the patient's gastroenterologists, colorectal surgeons, biofeedback nurses, stoma nurses, inflammatory bowel disease nurses and clinical dieticians so the reality of the body is always kept in mind.

Yet frequently physicians and psychotherapists alike are puzzled by how to approach the common gut problems that are defined as: Functional and Motility Disorders of the Gastrointestinal Tract because…

'Functional symptoms' are Gastrointestinal symptoms which have no underlying structural cause ! [8]

This is a very long list of symptoms which are frequently nonspecific, thus making the diagnosis difficult. They include:

Globus -the non painful sensation of a lump in the throat.

Dysphagia- a symptom that results from the slowing or cessation of a food or liquid bolus as it passes from the oral cavity through the oesophagus and into the stomach.

Noncardiac Chest Pain -recurrent episodes of angina-like pain without evidence of either functional or obstructive coronary artery disease.

Gastroesophageal Reflux Disease -a condition that develops when reflux of stomach contents cause troublesome symptoms and/or complications.

Aerophagia, Belching, and Rumination -excessive ingestion and expulsion of air and effortless regurgitation of undigested food into the oropharynx.

Dyspepsia – variety of complaints including abdominal pain or discomfort, bloating, belching, early satiety, epigastric fullness, nausea and "reflux".

Chronic Nausea -a subjective symptom, best described as a queasiness or sick sensation with the feeling of the imminent need to vomit.

Gastroparesis -delayed gastric emptying causing chronic neausa and vomiting.

Cyclical Vomiting Syndrome – episodic vomiting and associated intense nausea which resolves spontaneously. Episodes can last from 24 h to up to 2 weeks.

Gas and Bloating -subjective sensation of excessive gas/flatulence, fullness, abdominal hardness or tightness, or the feeling of abdominal inflation or swelling. This needs to be differentiated from *distension* which is reserved for an actual increase in abdominal girth. Small Intestinal Bacterial Overgrowth -the presence of increased numbers of colonic type bacteria in the small bowel.

Chronic Intestinal Pseudo-Obstruction -a rare yet debilitating neuromuscular disorder of the gastrointestinal tract characterised by impaired peristalsis with symptoms and imaging that may mimic mechanical bowel obstruction.

Functional Gallbladder Disorder -biliary-like pain in the absence of structural disease) Chronic Constipation -affects 2–27 % of the population, Often it coexists with dyspepsia and reflux symptoms and with frequent and severe abdominal pain.

Irritable Bowel Syndrome -one of the most common medical conditions seen and managed by both primary care and gastroenterology providers. It is characterized by abdominal pain with altered bowel habits and without structural or biomedical abnormalities to explain the symptoms. It has diverse etiologies and its severity

can range from mild and intermittent to severe and constant and quality of life can be significantly impaired.

Colonic Inertia -slow colonic transit time,

Chronic Diarrhea -an increase in frequency and or fluidity of stool.

Fecal Incontinence – Fecal incontinence results when continence mechanisms are compromised. Disorders that reduce stool consistency, weaken striated pelvic floor muscles or the internal anal sphincter, impair sensation, alter colonic transit time, increase stool volume and or reduce cognitive function may all contribute to Fecal Incontinence. There are different subtypes: passive incontinence, urge incontinence and fecal seepage.

Rectal Pain – Anorectal pain –proctalgia –is a common symptom affecting 6.6 % of the population can be liked to Anal Fissure, Pruritus Ani, Proctagia Fugax –sudden, unpredictable onset of deep anorectal pain, Levator Ani Syndrome, Solitary Rectal Ulcer Syndrome) [8]

All these symptoms cause significant psychological distress that in a vicious cycle can actually exacerbate them. At times it is very difficult to distinguish them from the embodiment, the physical manifestation of Stress, Fear, Anxiety and Depression (As C.G. Jung said "they are two sides of the same coin"). They frequently evoke deep feelings of extreme and devastating embranchment and shame, frustration, helplessness, worthlessness and hopelessness. The title-"Functional Disorder" is not always well understood by the patient and the discrepancy between the subjective severity of the symptoms and the lack of "hard" physiological findings is often perplexing and emotionally agonising.

So how can psychotherapy contribute to the healing process of these "Functional Gut Disorders"?

The word 'heal' is from the Germanic root 'heil' from which also derive 'health', 'whole' and 'holy'. These derivations offer us a clue to the process of healing [9]. Psychotherapy/Counselling may offer the patient, the space to articulate the experience of living with their body in a physical, practical and emotional sense. They have a story to tell and as an independent witness, the tale can be heard and validated, the distress supported, and the patient offered the freedom to express their feelings safely without judgement, perhaps for the first time. The space Psychotherapy/Counselling offers may also help to de-stigmatise what may have been, up till now, the taboo of discussing such personal symptoms [10]. At its most basic level this can be a powerful and a healing experience.

An individual's understanding of their problem modulates their pain [11].

A space to talk to a stranger can be both immensely challenging and relieving for someone, particularly if this particular kind of environment hasn't been made available before. While Psychotherapy/Counselling cannot promise to take away some or any of a patient's physical discomfort, an understanding of it can modulate the pain and increase patient confidence and self-worth or self-esteem, a vital component of any healthcare intervention. In cases of Irritable Bowel Syndrome (IBS), for example, psychosocial factors affect pain more than physiologic factors and also prominently influence symptom frequency, severity, overall health status, healthcare utilisation and clinical outcomes [12].

Indeed, although pain is not usually considered to be an emotion it is often associated with emotions such as anxiety and depression, and shares with emotion the three main components of subjective experience, physiological/bodily changes and expressive behaviour. According to the International Association for the Study of Pain (IASP), pain is '… an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.'

This suggests that pain is a subjective, personal experience that embraces both sensory (for example pulling, burning, aching) and emotional (for example anxiety, depression) qualities. Not only may anxiety be part of the experience of pain, but it is generally accepted that anxiety leads to an increase in the perception of pain. It is also a truism that depression often accompanies chronic pain and is positively associated with the pain intensity ratings of chronic pain patients [13].

For many it can be a revelation that they are welcome to talk about issues other than their illness. The Psychotherapy/Counselling sessions are to support the *person*, not just the condition. This can be freeing and, as Gillian Thomas says in her book "Counselling and Reflexive Research in Healthcare: Working Therapeutically with Clients with Inflammatory Bowel Disease", it cultivates 'an awareness that the other issues are sometimes part of the cause draining their emotional energy – energy which could be deployed in managing their ongoing condition' [10]. Counselling patients often prompts issues beyond illness which may be resurrected as a result from the condition.

As well as retelling the story of their illness, unresolved past events are often brought up in the room, and the counselling can help untie the knots to help people see the link between how they felt about past events and how they currently feel about their condition. When they can separate the feelings from the past to emotions about their current condition they can feel free from the confusion of merged feelings that may belong elsewhere. When this happens they can reframe their response to the condition and begin to feel differently. Psychotherapy/Counselling can not necessarily take away physical pain but it can help to reframe the internal response to the external manifestation.

An understanding of the cause of pain is important in reducing a patient's distress. The patient's health is most likely to change in a positive direction when the *meaning of the illness* has been changed for the patient in a positive way [14]. H Brody reports in 'Psychology, The science of mind and behaviour' that although 'meaning' is hard to define, one component is giving the patient an explanation (or an attribution) for their illness that is both understandable and as reassuring as is truthfully possible. People often claim that uncertainty is much more stressful than any diagnosis and this may be because uncertainty allows us to 'think the worst'.

15.1 What Helps a Patient?

A patient is helped when the listener is empathic, but what is the difference between empathy and sympathy? Empathy lets the speaker know you've not just listened to the words but have *heard and understood the feelings* beneath the words. (Empathy has been defined by the "self-psychologist" Heinz Kohut as "Vicarious

introspection" –the therapist looks into himself and explores how she/he would feel if they were in the same physical/emotional situation of the patient and in a verbal or a non verbal way echoes it to her/him).

Both empathy and sympathy are feelings concerning other people [15]. Sympathy is literally 'feeling with' – compassion for or commiseration with another person. The word derives from Latin and Greek words meaning 'having a fellow feeling'.

Empathy, by contrast, is literally 'feeling into' – the ability to project one's personality into another person and more fully understand that person. This term originated in psychology (translation of a German term, c. 1903) and has now come to mean the ability to imagine or project oneself into another person's position and experience all the sensations involved in that position. You feel empathy when you've "been there", and sympathy when you haven't.

A patient also needs to know that anything they feel is acceptable in the session regardless of how ashamed they may be.

Their courage needs to be validated to help them come to terms with their physicality and to offer the fullest opportunity of thinking about what's happened to them. Patients often feel totally out of control of a bodily function so a sense of involvement in decision-making which affects them is very important. Sometimes they can feel that those who care for them were also exerting control over them, such as medical professionals or their employers or family. This feeling of having some control back helps a patient to manage any changes in their life such as work, activities and regulating a different diet.

The psychological component looks at the interplay between the physicality and the emotional processes. Therapy cannot necessarily diminish or take away physical pain but it can acknowledge its existence, accept the pain, open a space to discuss it, normalise the taboo of the symptoms and be an advocate for a range of traditionally-unspoken feelings.

In such a space Psychotherapy/Counselling allows many feelings to bubble to the surface and any one of them is acceptable.

When a patient knows the listener can bear their pain and they don't have to protect the therapist from their distress as sometimes do members of their own family, it helps them accept themselves and their condition.

The emotional distress is complex and varied and is "made of": Loss, Depression, Anxiety, Stress, Anger, Guilt, Envy, Shame, Feeling not being believed, Secrecy and Loneliness, Trauma, Difficulties in Basic Trust and Rejection.

Loss – A long term physical disorder may bring many losses actual and potential, physically and psychically. They may no longer be able to work, or may have to alter their working pattern; sport or travel may be curtailed or stopped altogether due to physical limitations or psychic fears, relationships may be disrupted. There is the loss of their previous life, the loss of trust in oneself, perhaps loss of self-respect and perhaps in the people around them or of the professionals helping them; a loss of freedom, time and sense of security. The focus of their life is their disease, and it may be a long way into their situation that they are able to use some of their energy to review what has happened.

The loss of certainty also brings anxiety – the state of uncertainty, the unknown and the constant fear that comes with feeling out of any control. A patient can withdraw from family involvement, relinquish friends, be secretive about their condition through fear, shame or judgement, limit local outings, stop going on holiday, withdraw from community life and mourn the loss of actual and potential relationships, physical power and time. They may become totally absorbed in their bodily symptoms and there needs to be space, in every sense, to reflect on the loss.

The denial of the loss can distract from other painful losses [16]. Patients who have experienced an early loss, not necessarily through death but for example, being sent away from the family home or leaving their natal country, can find that the onset of their current health loss may resurrect earlier worrisome feelings of having to handle situations that were overwhelming. For many the sense of vulnerability from the onset of their condition will give rise to earlier frightening experiences of coping with circumstances beyond their control

15.2 Depression, Anxiety, Stress

Many of the patients attending for counselling present with, amongst other issues, depression, anxiety and stress. What are some of the signs of these presentations? The following is by no means a complete list.

Depression manifests in multifarious ways. As a physiology patient it might include one or more of the following – non-adherence with the current medical support, feelings of worthlessness, poor concentration, mood changes, thoughts of death, suicidal ideation, self-harm, severe self-neglect, hopelessness, helplessness, joylessness, disturbed sleep, lack of energy, changes in appetite, fatigue, lethargy, agitation or a slowing of movements.

What is the difference between stress and anxiety? Stress is a response to a *specific cause* – it goes away as the stressors disappear. The first meaning of stress is an external event which puts us under pressure – the row at home, the rush job at work [17].

The second meaning of 'stress' can also be used to describe our internal response to external events – a racing pulse, a sleepless night or an emotional outburst could be examples of stress. Stress is an event that puts us under pressure and our response to that pressure. We all need a certain amount of stress in order to function – without any stress we would have no reason to get up in the morning. We all need some stress to motivate us. However certain events such as bereavement, separation or loss of health are generally experienced as very difficult because they involve change – and uncertainty.

Anxiety is the process during which we become *fearful* and *uncertain* of the future with *no identifiable root cause*. It is the most common mental illness in Britain [18]. It is about unpredictability and the unknown. When events are totally unpredictable, which may be shown through their body, a patient will feel very unsafe. Anxiety is often enduring and patients can feel as though they are trapped in a vortex from which they can't escape. It is difficult to treat and can manifest itself

in medically unexplained symptoms such as a racing heart, shaking, pain, dizziness or panic attacks. Patients may have overwhelming feelings of intense fear to the extent they may think they're dying – to generalised anxiety disorder, where you have constant, intrusive and sometimes irrational worrying thoughts. A diagnosis of it is made when symptoms persist for at least six months. When patients see a connection between behaviour and result they experience greater control and motivation and less anxiety and depression [19].

Anger, Guilt and Envy are some of most difficult emotions to hold.

Anger (which in the Old Icelandic language is Angra-which means to Grieve) exist when health is compromised and the changes this has caused in their life, with the realisation that they are held back from reaching their full potential, particularly when there is no understanding of the reason why. Anger may be directed at oneself because they cannot control their own body, or may be directed at their body which has failed them. The anger may be valid or displaced, but unexpressed, towards professionals – those on whom they rely and are perceived as authoritative figures which they dare not challenge. If a patient does not feel properly attended to this may revive previous experiences of neglect or abuse. There may be rage directed towards colleagues, family or friends who are perceived not to understand their suffering, which is why empathy, the art of showing someone that they are *taken seriously, heard and understood,* can be enormously healing.

Guilt can be perceived as anger which is directed towards oneself and at the same time a maladaptive coping mechanism which paradoxically aims to provide the patient with a sense of control- 'If it is my fault, if it is because of me – I can do something about it'.

It is also impossible to avoid feeling Envious towards people who are lucky not to suffer these difficult painful and disabling gut disorders.

Shame and feeling not being believed – The advent of a colo-rectal or gastrointestinal dysfunction is stigmatic for many. It can be one of the last taboos to break in speaking of it even in the safe confines of the counselling room. To live with the hidden condition and know that one's bodily symptoms such as flatus or incontinence can be revealed in public can be very shaming [10]. An unwillingness to discuss the condition can mean potential support is reduced as fewer people know about their situation. Secrecy is one of the outcomes of shame and with it fear and judgement. The ripple effects of such felt shame can affect the will to make or sustain relationships for fear of revealing the condition, or cause the belief that no-one would be able to accept their condition. The patient will have *their* story and their family, friends, colleagues and the health professionals will have theirs. It can be annihilating when a patient feels their own reality is not respected and the counselling room offers a space for that story to be honoured and taken at face value.

People who have experienced emotional neglect and have not been attended to adequately as a child can find it hard to self-nurture emotionally as an adult or treat their own feelings seriously. This has ripple effects as such a patient is less able to absorb help from others.

Secrecy and loneliness– these have its roots in fear, shame and judgement. How can a patient feel it is safe to tell about their condition? Will they be pigeon-holed or

outcast if they tell a boss, partner or friend? Often the experience of counselling will help a patient to open up outside with others. The secrecy can make the condition a very lonely illness and exacerbate a patient's isolation. Loneliness is more than just an external state. Child psychotherapist Melanie Klein writing in an essay in 1963 said that loneliness is part of the human condition and that our yearning is to be understood without words [20]. It also hinders the opportunity for others to adjust to the patient's illness and subsequently to make allowances for the patient's difficulties. The loneliness can be compounded by difficulties in physical intimacy either through their own unwillingness or that of their partner. For some much of their energy is poured into tackling the pain, discomfort or distress of the condition. Some fear faecal contamination during intercourse and disgust with their own bodies. Some feel misunderstood, ridiculed or shamed by their partners. Some project their own feelings of self-disgust onto their partner thinking their partner is shunning them when in fact they hate their own bodies. The lack of being able to show physical love can be enormously shaming and imbued with guilt and contribute to more secrecy.

15.3 Trauma and Trust

The trauma of sexual, physical and emotional abuse is commonly present with a patient who suffers from Functional and Motility Disorders of the Gastro intestinal tract (for example it was found that 62 % of women with Idiopathic Gastroparesis reported a history of Physical and or sexual abuse, and physical abuse was significantly associated with Abdominal Pain, Somatisation, Depression and life time surgeries [21]).

Also we find that often the trauma is concealed, not rarely, for the first time in the patient's life, after speaking to an empathic medic/counsellor. Sexual abuse can have the effect of psychologically disassociating from the genital area. As Christine Norton and Sonya Chelvanayagam describe in their book Bowel Continence Nursing, patients with a history of abuse can completely cut themselves off from their pelvic region and as a result, in some cases, may demonstrate incoordination of their defaecatory muscles. They are no longer able to associate themselves with these muscles [22].

Discussing the abuse in a safe confidential setting helps to normalise and validate their feelings, however while some patients will offer this information either immediately or introduce it later on when they feel safe, others may allude to it but never want to discuss it concretely and this has to be respected.

The issue of trust is paramount particularly with deeply sensitive issues and patients who have had their trust severely tested by a parent, relatives or others would find it understandably difficult to place trust in other figures of authority. Patients who have experienced a loss of trust will find further loss of health particularly hard to manage.

Rejection/Expectation – a patient will often feel self-disgust with their physical self. They also hate the notion that they cannot – and fear they will not be able to in

the future – fulfil their hopes and expectations. If they are perfectionists then the idea of less than perfect health will be extremely challenging. Some put on a false front – the show of positivity, bravado, comedy and stoicism by hiding their fear/disgust in order to be acceptable to colleagues and family. They joke about it or dismiss it to make everyone else feel easy –putting on a false front in the words of paediatrician and psychotherapist DW Winnicott [23]. Some, as an in-patient may feel they have to be a cheerful patient to gain approval. Some are sensitive to the unspoken wish for them to be positive, brave and stoical and when they are they're praised for it. Many may believe that the unspoken request to be a patient is based on the unwillingness of others to face their own upset and helplessness in the face of distress. When people say to the patient "Be brave" they're saying "I'm not brave, don't upset me."

We would like to share with you how all the above is unveiled and expressed in our daily work at St Mark's Hospital through two case histories -two personal stories. The personal unique stories are at the core of it all and it is healing for the true stories to be told and listened to.

15.4 Case History – Geoff

Background – Geoff, a former fireman in his 50s, attended the clinic for some short-term counselling with depression and post-traumatic stress disorder from an accident in a training incident at work some 20 years earlier. He had fractured his lumber vertebrae leaving him with nerve damage and bowel and bladder problems as well as thoracic nerve damage. His mobility had decreased and he attended in a wheelchair as he was prone to falls. Eating was problematic as, although there was no apparent medical reason, he was unable to swallow food, and a feeding tube, (or Percutaneous Endoscopic Gastrostomy), was in place. He was managing his bowels by taking a regular dose of medication and was opening his bowels every 2–5 weeks which had prevented the autonomic dysreflexia that he was experiencing previously. He was also taking numerous medications for chronic depression.

Emotional impact The trauma was still psychically alive and he was experiencing nightmares and flashbacks not only from the accident, but also from previous traumas within his fire-fighting history and his former profession as a tree surgeon. The accident had also resurrected distress from events going back to his childhood.

He had withdrawn from social contact spending a lot of time in bed or staying in the bedroom with the curtains closed, in his words 'living in the dark', despite the support of his wife as main carer, and his two grown up daughters.

He reported feeling 'emotionally numb' through drugs and sometimes alcohol.

As someone used to taking control professionally both physically and in decision-making the accident had forced him to yield control of aspects of his body which would have contributed to feelings of powerlessness and anger. He stated concretely his suicidal ideation should his wife pre-decease him, for fear of burdening his children.

Effect on partner/family – He mourned the loss of participating fully in his young children's growing up and felt guilty that the accident had impacted so extensively on his family. Some of his medication meant that foreign travel was not possible. He was still withdrawing from social interaction and much of his social connection was through social media, using a dedicated website set up by a former colleague, which he used as a much needed vehicle for expressing some of his rage. The counselling sessions provided another space to vent anger not only about the accident but also about being overlooked by the brigade in their lack of after-care or acknowledgement of the accident or for his efforts at major events in his professional role. He also spoke about areas of abuse and lack of acknowledgement in his childhood. Through the sessions he was able to understand how the historical childhood hurt could have contributed to the intensity of his feelings in the aftermath of his accident. He expressed anger at medical misdiagnoses and insensitive remarks by strangers in the street and medical professionals.

The validation of his psychic and physical pain was vital.

Sigmund Freud claimed that the Psychoanalyst should be like an "Opaque Mirror" to the patient; meaning that she/he shouldn't disclose anything about herself/himself in order to facilitate the projections of the patient on him in the "Transference". Such a detached approach is rarely helpful in the context of working with people in a hospital setting where the therapist needs to be a living human presence in order to accompany the patient's painful illness journey and as such may share his personal thoughts, feelings and experiences in a heart to heart dialogue if it is needed for the patient (such self disclosure is allowed and encouraged in the modern Psychoanalytic approach called "Inter-Subjective" and is part of the "Jungian" school of thought that always believed that there are two human beings in the room. The patient and the therapist are not an object for projections or an "It" to be analysed she/he is a "Thou" – a whole human being (a concept that was coined by the Jewish philosopher Martin Buber in his book "I and Thou" [24]) It echoes with the famous line in the biblical Psalms 23:4: "Even though I walk through the valley of the shadow of death, I will fear no evil for you are with me".

Such a moment happened in the therapy with Geoff. While he told the therapist about how he saved a little girl and her puppy from a fire, the therapist spontaneously disclosed her feelings and said: "You very nearly made me cry ".

Tim later repeatedly said: "I don't know why but these six words transformed me "

He described how following being touched by these six words "he had begun to feel 'more alive'" and his drug intake had reduced. During this mutual therapeutic work he reported that the day after his 56th birthday he had attempted to walk outside of the house for the first time in many years without the aid of the wheelchair.

Although this resulted in a fall it held much meaning, coming as it did on his birthday, symbolising a statement of his physicality and increasing confidence.

There had been enormous loss for him – of his health, his professional role which held a lot of his identity, physical power, family life as he'd known it, colleagues, his future hopes, and also the death of his beloved father. His career roles as fireman and tree surgeon had allowed him to be a rescuer in a very physical sense. His

identity had been bound up with 'doing'. Now he could not rely on that. With the loss of his physical prowess his identity had been challenged and he needed to discover a new sense of belonging.

Towards the end of the sessions he mentioned partaking in events that while apparently small in themselves, held great significance. He had gone *alone* to the barber's; he'd bought a lottery ticket, suggesting an investment in the future in more ways than one; he was planning the addition of an en- suite bathroom – all suggestive of a growing sense of involvement, decision-making, hope and self-esteem.

He discussed his sleep dreams and while they revealed much trauma, demonstrated how he was increasingly able to integrate his ordeal with some sense of resolution.

Outcome – Geoff was able to explore his sense of guilt over the limited involvement and contribution with his young family. His capacity to speak helped him reduce his sense of isolation and anxiety. As he discussed events from the past he could see how they may have contributed to the intensity of his current fears and was able to manage, or regulate, these feelings better. This helped to lessen his guilt feelings, raise his self-esteem and enable him to become more involved in decision-making – for example to resolve to improve the house which he could enjoy in the future.

He had tentatively begun to integrate the trauma into his life. He joined a group to buy and restore an old fire engine, arguably a symbol for his efforts in restoring himself; he hosted his best friend visiting from abroad; he was able to feel joy that his dog survived a serious operation. He spoke with pride of the professional role he played in the King's Cross tube fire; he was able to validate himself for his role in rescuing fire victims; he was able to remember and feel the pride of his father participation in WWII and of his father's pride when seeing Tim in his fireman's uniform for the first time. He had also been able to offer encouragement to another fireman who had been physically hurt. Slowly, the 'emotional numbness' was unravelling.

At the penultimate session he arrived for the first time without taking painkillers and was not anxious about it. He was nervous about 'being out alone in the big wide world'. He told me, almost incidentally, that he'd made arrangements for his future care, should he be widowed, demonstrating that he was able to plan for a future even if without his wife. His self-esteem had risen sufficiently to consider handling this potential outcome, demonstrating an increased sense of safety and willingness to live.

I saw Geoff some months on from the end of his last counselling session. When I went to meet him in the reception area I saw a tall figure at the end of the corridor, standing, waiting for me. He was no longer using a wheelchair but instead a walking frame. He described how, in the preceding months, he'd been busy helping in the garden, having bought a new lawn mower. He'd attended a hospital appointment for the first time, unaccompanied by anyone. He had a PEG in place to eat and to use for his medication.

One day he decided to try to take them orally and he was able to swallow them, crushed, with water. Not only had he been able to swallow them, but he'd trusted

himself enough to attempt to, and believe the possibility existed that it would work. Since then he's been able, for the first time in years, to enjoy tea and coffee. He reported that the family were thinking of moving house. He was engaging more in sitting with the family in the evening and engaging in family disagreements more, a growing sign of his and their ability to feel safer emotionally around each other. These were some of the effects of increased self-trust and self-esteem, which has contributed to Geoff's ability to make decisions in his future.

15.5 Case History Maria

Maria, a 37 year old book-keeper and translator, became constipated when she was 4 years old and the issue worsened at seven when she experienced pain and bloating. She remembered regular trips to the hospital A&E department.

Maria came to the UK 4 years ago from her native Rumania with her husband and son, now 12. Although highly competent at her work her stomach pains and concomitant gut noises had blighted her confidence at work and even restricted *where* she worked. She avoided going on holiday or staying overnight with friends because of the shame she felt. She had made adjustments to her diet and had stopped taking fibre tablets which had helped but had for many years experienced extreme anxiety.

During the 4 years since coming to the UK there had been inevitable transitional changes for both her and her husband including a change of jobs. She found it hard to refuse requests from work clients or her husband or son – it was very hard for her to contemplate, let alone ask for, her own needs. Neither could she give herself any value for any of her achievements but felt she had to keep pleasing, and appeasing, others in order to possess any self-worth.

The onset of her constipation had come at a time of great upheaval and family changes in Rumania additionally, becoming ill when young was confusing and frightening. As well as dealing with a debilitating gut issue which she may not have understood, she was also tackling the developmental tasks of teenage-hood involving changes in the realm of the physical, intellectual, practical, emotional and sexual. It would have been important for her to have been supported sympathetically. As a child she felt she'd no voice or recognition and had subsequently held on to a significant level of anger. She was given praise and value only if she achieved good school grades. She was a diligent student and excelled. If she didn't achieve these grades she was beaten. She learnt that in order to feel valued the 'doing' (or achieving) part of her, was all important. This contributed to ignoring the 'being' part of her – the innate qualities that existed within her intrinsically – which had been unacknowledged parentally and now as a woman, by Maria herself.

Inevitably, this contributed to low self-worth. Maria said that she had always experienced the distress of childhood 'in my gut'. "The tension was there, the pain, the discomfort. I kept it all inside as I wasn't brave enough to express it in any way. If I had [expressed it] I would have ended up beaten, punished and mocked. It all stayed inside."

The inability to express her difficult feelings led to a confused relationship with food, resulting in binge-eating in secret. Eating inappropriately can be linked to an attempt to gain some level of control when we experience no control in other areas.

It can be an endeavour to 'feed' an emotional need and can become an addictive behaviour. Although it is probably not the correct etymology-Addiction can be perceived as the inability to express our feelings.

When we are trapped in any addictive behaviour we just do things automatically and don't reflect. The word 'diction' is related to the use of words and 'ad-diction' is related to having *no words*.

When we're unable to use words to express feeling we may act out the feeling behaviourally. "I cover myself in layers of fat so that I don't see myself- that I can't be loved," she said.

She had left Rumania not having resolved her distress with members of her family. Like her constipation, she had held on to her pain. Over the course of her counselling she began to break the cycle of holding on to her needs and began to talk to her husband about her priorities and needs which evoked subtle but significant changes in and around her. One day she said she was "not afraid to face [her] self." Once she began to make sense of how she felt, she was able to trust herself more and felt internally stronger. Her relationship with her husband improved, her libido increased, she modified her diet, began emptying her bowels more regularly and her gut was less painful and noisy. She also began a volunteering project at her local library offering reading help to fellow Rumanians. By supporting others to read, she was mirroring a skill she had developed for herself – in emotional self-reading.

Traditional wisdom in supporting psychic pain suggests exploring the relationship with Self. When our relationship within ourselves changes, it is reflected in other relationships – family, friends, neighbours, colleagues and the community. Maria had regularly felt not being believed or demeaned by others but she had started to trust her own feelings and this was reflected in her external relationships. A member of her family phoned her one day to ask her opinion on a business matter. Her opinions had always been demeaned previously, but on this occasion her response was taken seriously. This encouraged her to open a social media account so that other family members could follow her news. She was feeling safer to be seen and heard.

Having begun to acknowledge the anger from childhood she took responsibility for her feelings. She had attributed to her family power that they didn't actually possess and had held on to her pain. Finally she was able to start giving herself what she had craved – self-acceptance- integrating the strong and vulnerable parts of her. She was less self-critical and more assertive of her own needs. Her self-trust increased, her fear of interacting with others reduced and her relationship with her gut improved as she was less fearful of it. She was able to be more honest with herself and others because she knew that whatever the response, she was strong enough to deal with her feelings.

By discussing her constipation and difficult feelings the more she was able to present an authentic rather than, in the words of paediatrician and psychoanalyst D W Winnicott, the 'false self'. The ripple effects played out in her family, work and community life. Since the sessions she reports that she rests more, sleeps better, that her bowels are more regular, and the pain and gut noises have all but stopped. She is confident at work and to travel. She manages stress with less fear and uses coping strategies. Maria said "After complaining my whole life and seeing myself as a

victim I am now a strong woman and not a frightened child anymore. I can now say 'stop' or 'no'. I feel not just more in control but feel free from feeling guilty, worthless and unappreciated."

15.6 Counselling Service in Biofeedback – The First Year

The Counselling service at the Physiology Department of St Mark's (Integrated with the Psychological Medicine Unit of the Hospital-which also provides weekly group supervision to the Biofeedback Nurses) began in May 2014 as part of the multi-disciplinary service within the colo-rectal gastro-intestinal department. Senior nurses within the biofeedback unit attending to patients with chronic functional bowel disorders were regularly meeting patients who were presenting, together with their bowel disorder, considerable psychic distress. They recognised that patients needed a supplementary space to vent not only their physical pain and discomfort but the psychic elements of their situation – fear, anger, confusion, stress, anxiety, depression and sometimes suicidal ideation. The service has aimed to allow a space to discuss not just the gut pathology but to support the person as a whole, allowing patients to discuss whatever issue is pertinent to their distress, be it their gut, pain, feelings, relationships or otherwise. In their book 'Bowel Continence Nursing', editors Christine Norton and Sonya Chelvanayagam say that whatever the approach the patient may experience the therapeutic effect of being listened to when talking about symptoms that affect all aspects of their everyday life. This allows the patient to bring many associated issues to the sessions, such as relationship disharmony, loss of perceived good health and feeling stigmatised. They may also ventilate seemingly unrelated issues and come to understand the connection between their physical state and their emotional well-being [25].

Counselling in the physiology department takes an integrative approach with patients including short-term Psychodynamic-Psychotherapy, CBT, DBT, coping skills, stress management, muscle relaxation techniques, practice in communicating effectively with family members and healthcare providers and providing positive reinforcement for displaying coping behaviour. In their first session the patient is invited to discuss how their physical distress and pain has impacted on their life. Most patients want this opportunity of venting how awful it is living with their body at it is. As Norton and Chelvanayagam say, it is a chance to think through the situation, the history of its genesis and describe what is actually happening [26]. Many feel very alone with their problem which they see as taboo. Feelings of guilt, shame, disgust and secrecy are frequently aired.

At the time of writing the service is entering its second year with over 140 in- and outpatients being referred through the physiology multi-disciplinary team of nurses, doctors and surgeons. The service is offered to all adults from 19 years upwards – the oldest so far has been an 80 year old man. Most of the patients using the short-term intervention of 5–6 sessions are women – around two thirds – and the vast majority use the entire allocation available. Many, because of the complex presentations that arise, request and need further input, which because of limited resources we cannot yet provide.

A very small number who were offered the service have refused it and this may have much to do with the initial motivation of the patient, the perceived stigma of counselling or previously negative experiences of a therapeutic space. There have been a small number of patients who have cancelled at the first or second appointment.

As Gillian Thomas, in her book "Counselling and Reflexive Research in Healthcare" [10] says, for many it may be the first time a patient has been able to talk to someone about what it has been like living with their body in a physical, practical and emotional way. The loss of health over a protracted period may not only be exhausting, infuriating, limiting, disempowering and frightening, it can also resurrect early upsetting loss and past vulnerabilities.

The service, at a basic level, acts as a witness to pain in every sense. This in itself can be cathartic. While counselling cannot promise to take away pain, it can acknowledge its existence, validate the courage in living with it up till now and the steps taken so far in managing it. It can also support the distress and give the time and freedom to break down the taboo of the unspoken – bodily symptoms which traditionally and culturally can give rise to shame, disgust, self-loathing and fear. The space also offers the chance to express three of the most difficult feelings to own: anger, envy and guilt. It also allows patients the possibility of adjusting their response to what has been, and is currently, happening physically and psychically.

Because St Mark's offers a local, national and international service to patients, the geographical distance means telephone counselling – with the imminent advent of Skype – is offered to people. Telephonic communication is also appropriate when the physical discomfort of coping with incontinence and pain makes travel untenable or when the anxiety of dealing with an unreliable gut in unfamiliar surroundings makes the notion of being away from home even for a short term too stressful.

Feedback has shown that almost all (95 % of patients in a May 2015 audit) were motivated to attend counselling and most patients (39 %) waited a maximum of three to four weeks to be seen. Just 13 % waited five to seven weeks.

In terms of physical presentations, patients could present with either single or multiple diagnoses. In the first year almost half (47 %) presented with incontinence and 37 % with constipation difficulties. Nineteen per cent presented with IBS and 15 % with IBD.

In the physic realm, patients presented with single or dual diagnoses in the following areas:

Nine per cent presented with suicidal ideation, 31 % with depression, 53 % with anxiety or stress and 7 % with post-traumatic stress disorder, bereavement, panic attacks, and dementia onset.

We can see that the vast majority of patients presented with anxiety and stress and it's useful to note the discrete difference between the two. Stress is a response to a *specific cause* – it goes away as the stressors disappear. Anxiety is process during which we become *fearful* and *uncertain* of the future with *no identifiable root cause*. It is enduring, difficult to treat, can manifest itself in medically unexplained symptoms such as pain, dizziness and panic attacks and is a legitimate mental disorder.

15.7 Did Bowel Function Improve?

Amongst the outcome findings, 61 % of patients found that bowel function improved. Twenty six per cent said it made no difference and 13 % made no comment.

15.8 Was There a Change in General Well-being and Self-esteem?

Ninety one per cent reported an improvement in *general well-being;* 9 % said they'd benefitted a little. All reported high increases in *self-esteem*. This is an important outcome and impresses the need for patients of having a safe space to talk, as many began with high levels of self-loathing, fear and hatred of themselves or their condition.

15.9 Was There Enough Time in Each Session?

Three quarters of patients said they had had sufficient time in session, though a significant quarter felt that the time allocated was not enough. This is understandable in light of the restricted number of sessions allowed.

15.10 Sufficient Sessions?

Interestingly there was an almost even split in response about this. Thirty nine per cent said there were sufficient sessions (of five or six); however almost a third (30.5 %) said the number of sessions offered was insufficient and the same percentage didn't feel strongly either way. (Interestingly a recent survey commissioned by the United Kingdom Council for Psychotherapy (UKCP) and the British Psychoanalytic Council (BPC) reports that 58 % of patients were unable to get the type of help they need on the NHS and that 63 % of patients felt that the therapy they were offered was too short for their needs [27].

15.11 Professional Service?

All patients rated the service as professional. For many, being listened to, being believed and taken seriously was paramount.

"I was able to think clearly".
"It was beneficial to talk face to face with a stranger".
"It taught me how to manage my feelings and handle stress."
"My health problem are still there but I feel supported."
"It was a relief to have time to talk and be understood."
"I could rely on myself more and didn't feel so afraid."

15.12 Beneficial Outcomes

We see then that patients can benefit from the service even if the original physical pathology does not change dramatically. However, we know that in many cases – over 60 % – a patient's bowel function makes some improvement. The service helps patients feel they've been taken seriously which raises their confidence in asking for help and leads to reduced isolation. They've been able to express, and make sense of, amongst other feelings, three of the most difficult emotional states: anger, envy, guilt. They can learn to understand the link between body and feelings. They take away coping mechanisms.

Self-trust increases so that patients become more involved in self-nurture and can discuss concerns such as drugs and treatment options with medical professionals more easily which reduces anxiety and any sense of isolation. Decision-making, an important factor in the healing process, is greatly connected to self-trust and self-esteem. The counselling room is often a microcosm of what is occurring outside for the patient in their thinking, feeling and behaviour, so if s/he is able to tentatively make decisions during the course of counselling the ripples occur elsewhere.

15.13 Other Outcomes

The patient can talk to someone outside the family who will listen and who they don't have to protect from being upset;

The patient can be more open with professionals. When a patient stops blaming themselves they can afford to be more vulnerable with others including health professionals and their family and address areas that may concern them such has drugs and other treatments.

The taboo of the unspeakable is broken.

The feeling of isolation changes.

They can discuss the limits of their condition with hope using their inner resources and courage;

Patients can voice concerns in the counselling room that they may not have dared to previously;

They can learn coping mechanisms to deal with real and imagined fears – such as urgency and soiling while in the supermarket (real) and are there toilets abroad? (imagined).

A patient has a safe space with someone to witness to their experience, to help make sense of what is happening so that their suffering has meaning, to validate the patient's experience, to normalise their feelings [28];

Counselling can never completely resolve every problem but it is a way where a patient can be symbolically 'held' through the story and perhaps for the first time think out loud long-held thoughts and fears, and meet themselves;

The courage they have shown in the steps they've taken so far can be validated;

A therapist can modulate their approach to accommodate the patient's needs;
The patient's motivation is crucial in optimising the therapeutic space. For some counselling may be too painful, frightening, or stigmatic;
As well as looking at areas such as a patient's distress, physical discomfort, mobility and body image, it is a chance to look at, and embrace, the patient's strengths, the parts of their lives in which they find security and well-being, daily functional living, social activities, work and personal relationships;
A patient's confidence and self-worth can increase even within the confines of their symptoms.

15.14 What Does This Show?

Patients can benefit from talking to an impartial stranger who won't make judgements and who they don't have to protect from their own distress. Being believed and taken seriously is vital in reducing psychic pain which can affect the physical component. The taboo of owning strong feelings such as anger, envy and guilt, can be discussed. A patient can reframe the fear of medical professionals as being authoritative and distant with whom they feel unable to be open. The link between gut and feelings can be understood. The taboo of discussing the gut and bowel can be broken. Patients learn coping mechanisms. Their anxiety and isolation lessens. Increased decision-making reduces anxiety. Patients feel safer and more in control. The gut often benefits physically from the space. Even if the external physical situation remains, a patient can feel better equipped to handle it.

15.15 Considerations for the Future of This Service

Many patients present with complex issues requiring longer-term therapy, such as suicidal ideation, bereavement and loss, chronic depression, and trust issues which currently the Short Term -6 sessions service can not provide an issue which sits alongside a growing waiting list (though some of these patients might be able to continue a longer term psychotherapy at the Psychological Medicine Unit) Another focal point is the challenge of a service that, due to its departmental structure, cannot allow for simultaneous intervention of both biofeedback nursing and counselling. We have anecdotal feedback from patients and medical opinion that about one third of the patients attending would benefit from simultaneous counselling and biofeedback nursing. Currently the Biofeedback nursing team makes a decision about the greater need of the patient – physical or psychological. This can be very difficult for patients when clearly they often need support in both areas and is something the Department aims to address.

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As human beings we need to live with a very particular duality:

We have a Body and at the same time We are the Body.

We don't always live in harmony with the Body which C.G. Jung calls "the shadow-side of ourselves":

> We do not like to look at the shadow-side of ourselves; therefore there are many people in our civilized society who have lost their shadow altogether, have lost the third dimension, and with it they have usually lost the body. The body is the most doubtful friend because it produces things we do not like… [29]

In our particular field that can be called Psycho-Gastroenterology we meet daily those unlikeable "shadowy" things that the body produces (the faecal incontinence, the flatulence, the abdominal cramps, the diarrhoea, the constipation…) but we approach them with compassionate curiosity and respect, so our patients can be redeemed from the condemnation and the deep guilt and shame that accompany them.

Unfortunately this lower "shadowy " part of the body became synonym with ugliness and dirt. An "Ass-Hole" became a curse instead of respecting and praising this amaizing part of the body with its delicate sophisticated sphincter that enables us to be alive and function and work in society.

Interestingly, Judaism found a way to embrace this bodily shadow through the daily prayer

"Asher Yazar ".

Asher yatzar: "Who [has] formed [man(kind)]") is a blessing in Judaism. It is traditionally recited after engaging in an act of excretion [1], but is also included in many Jewish prayer books as a part of daily prayer prior to Birkat HaShachar -the Morning Prayer.

The purpose of this blessing is to thank God for good health It expresses thanks for having the ability to excrete, for without it existence would be impossible.

Though recited normally by observant Jews each time excretory functions are used, hence giving it the name the "bathroom blessing", it is also recited during the Shacharit-the Morning Prayer service due to its spiritual significance (to Jews, humans are made in God's image, so it is an expression of awe toward God's creations).

And this is how it goes:

> Blessed are You, our God, King of the universe, Who formed man with wisdom and created within him many openings and many hollows. It is obvious and known before Your Throne of Glory that if even one of them ruptures, or if even one of them becomes blocked, it would be impossible to survive and to stand before You (even for a short period). Blessed are You, our God, Who heals all flesh and acts wondrously. [30]

We recommend to be reminded of it from time to time …Amen.

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Index

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