**constipation**

Most patients experience constipation at some time, and the causes are many. It is important for GPs to distinguish between acute and recent onset and chronic constipation, and whether there is an obstruction causing constipation or constipation causing obstruction. In children, congenital conditions and toilet training issues also need to be borne in mind. This article is a review of constipation and its management in adult and child populations. The article was written by Rod MacLeod, a palliative care specialist at North Shore Hospice, Auckland and Pat Boulton, medical officer at the Child and Adolescent Community Centre, Taranaki Base Hospital.

**Problem prevalent but definitions vary**

Constipation is common and is reported to affect 10 per cent of the population, with gender prevalence for females. In the elderly population, prevalence ranges from 15 to 20 per cent in community dwellers and up to 50 per cent in some studies of residential care facilities.

Constipation accounts for about 3 per cent of general paediatric outpatient visits and 25 per cent in a paediatric gastroenterology clinic. Studies suggest primary care health professionals currently tend to undertreat children with constipation.

One review suggests there are over 2.5 million US consultations annually for constipation alone. In New Zealand and other developed countries, physical illness, poor diet, advancing age and hospitalisation are major risk factors.

For a number of reasons, there is also a much higher incidence in those who are terminally ill. One UK report suggests half of those admitted to inpatient hospices are constipated; this does not include those adequately treated with laxatives.

There could be a wide variation in what people think of as constipation – 95 per cent of adults have between three and 21 bowel movements a week. Children have a similar wide range of movement frequency and breastfed babies have an even wider range.

In children, constipation is often accompanied by soiling past the age of toilet training. In fact, this becomes the dominant complaint as the constipated child develops. A “quick fix” is often not possible for child constipation with soiling.

From a medical perspective, diminishing frequency to fewer than three bowel movements a week is one definition of adult constipation, but there is no general agreement. Generally speaking, the passage of small, hard faeces infrequently and with difficulty is an accepted definition. However, this may not be satisfactory or easy to identify. In children, the definition traditionally centres on a delay or difficulty in defecation present for two weeks or more, but it also includes the hardness and size of the stool.

One other definition for the adult diagnosis is that two of the following six criteria are present for at least 12 weeks in the preceding months.

- Straining during at least one in four bowel movements.
- Pellet-like or hard stools for at least one in four movements.
- Sensation of incomplete evacuation for at least one in four movements.
- Sensation of anal blockage for at least one in four movements.
- Using manual manoeuvres (including digital evacuation or pressure on the perineum) to facilitate more than one in four movements.
- Having no more than three movements per week.

Of relevance is a premorbid bowel history. Patients may also report increased flatulence, bloating, abdominal pain and feeling of incomplete evacuation.

Not passing stools for a few days does not generally cause significant physical discomfort but it can cause psychological distress to some people. People generally do not come to any harm if they do not open their bowels frequently but of course any change in bowel habit should be taken seriously and investigated thoroughly.

Consequently, the investigation and management of constipation can take up a significant part of a GP’s time. In one UK study of chronic constipation in the community, it was estimated 10 per cent of community nursing time is spent on constipation – so whichever way you look at it is a major healthcare issue.

**Do you need to read this article? Try this quiz**

1. The normal state of the rectum is to be empty. True/False
2. The prokinetic cisapride can be used as a laxative. True/False
3. Fecal impaction can be treated with oral medication. True/False
4. Child constipation can be the cause of day wetting. True/False
5. Hirschsprung’s disease is always diagnosed in the neonatal period. True/False

Answers on page 37
Gl motility under nervous control

Constipation is the result of an upset in normal bowel function. Intestinal motility patterns have two functions:
- mixing the bowel contents, which facilitates the enzymatic digestion initiated by the saliva, and
- bursts of forward propulsive motor activity (every 90 to 120 minutes) in the small bowel, and six times a day in the large bowel, grouped at wakening and midday.

Motility is coordinated by the myenteric nerve plexus and may be modulated by the wider nervous system, mainly via the parasympathetic system. From there, the smooth muscle layer of the intestinal wall propagates the impulse.

During defecation, abdominal pressure is raised by abdominal muscle contraction and is facilitated by squatting. This is a step many debilitated and relatively immobile patients find difficult. Once initiated, by distension of the rectal wall, an anocolonic reflex produces distal colonic contraction, continuing the process of defecation. Anorectal sensitivity reduces with age. Under normal circumstances, therefore, defecation means adopting a suitable posture, contracting the diaphragm and abdominal muscles, and relaxing the puborectalis and external anal sphincter muscles (Figure 1).

Low spinal cord lesions produce colonic dilatation, reduced transit in the transverse and descending colon and reduced rectal sensation. Higher lesions also reduce the mixing response to food ingestion.

Causes of constipation

The causes of constipation are often multiple (Table 1) and include medications (Table 2). Alterations in colonic structure and function in the elderly include decreased rectal compliance, increased sensory threshold for an urge to defecate and decreased resting and squeezing pressures in the anal canal.

Figure 1. Anatomy of the descending colon, rectum and anal sphincters. Pelvic floor dysfunction may inhibit the normal dynamics of defecation

<table>
<thead>
<tr>
<th>Drug class</th>
<th>Generics</th>
<th>Constipating mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>antacids</td>
<td>aluminium hydroxide, calcium salts</td>
<td>astringent action may cause constipation</td>
</tr>
<tr>
<td>hypo-lipidemics</td>
<td>cholestyramine, ferrous sulphate</td>
<td>decreased bowel motility, dehydration or fluid restriction may cause intestinal obstruction; haemorrhoids and fissures; faecal impaction, may occur</td>
</tr>
<tr>
<td>anticholinergics</td>
<td>benztropine, benxthexol</td>
<td>inhibition of acetylcholine action on smooth muscle, leading to reduced bowel tone and motility</td>
</tr>
<tr>
<td>atropine-like drugs</td>
<td>orphenadrine</td>
<td></td>
</tr>
<tr>
<td>dopaminergics</td>
<td>levodopa</td>
<td></td>
</tr>
<tr>
<td>antidepressants</td>
<td>amitriptyline, nortriptyline, imipramine</td>
<td>anticholinergic action on bowel smooth muscle wall</td>
</tr>
<tr>
<td>tranquillisers</td>
<td>chlorpromazine, trifluoperazine, thioridazine</td>
<td>myenteric plexus damage can occur; causing chronic constipation and pseudo-obstruction; faecal impaction could result in local inflammation (chronic and acute), ulceration, bleeding and even perforation</td>
</tr>
<tr>
<td>antineoplastics</td>
<td>vincristine</td>
<td>upper colon impaction may occur; paralytic ileus, particularly in young children and the elderly, can occur</td>
</tr>
<tr>
<td>opioid analgesics</td>
<td>codeine phosphate, dextropropoxyphene, morphine, oxycodeone, methadone, fentanyl</td>
<td>an increased resting tone of bowel smooth muscle is associated with reduced propulsion and force of peristaltic contractions</td>
</tr>
<tr>
<td>antihistamines</td>
<td>diphenhydramine, promethazine</td>
<td>intrinsically anticholinergic activity</td>
</tr>
<tr>
<td>laxatives</td>
<td>senna, bisacodyl</td>
<td>chronic use (abuse) leads to loss of smooth muscle tone (atony) and contractility, which inhibits normal peristalsis; results in “cathartic colon”</td>
</tr>
<tr>
<td>diuretics (non-K sparing)</td>
<td>chlorothalidone, thiazides, frusemide</td>
<td>dehydration can cause hard faecal mass; high use of K+ supplements can cause ischemic ulceration, which heals with fibrosis and partially obstructs the bowel</td>
</tr>
<tr>
<td>antihypertensives</td>
<td>clonidine</td>
<td>not known, but constipation common</td>
</tr>
<tr>
<td>anti-arrhythmins</td>
<td>verapamil, dipyramide</td>
<td></td>
</tr>
</tbody>
</table>
Adult constipation: careful history key

Accurate diagnosis, as always, depends on an accurate history. Enquiry should be made about stool frequency and consistency and possible associated symptoms, e.g., nausea, vomiting, pain and distension. Time taken attempting to evacuate the bowel is also relevant.

Symptoms and signs associated with constipation are multiple, and may include anorexia, bloating, abdominal discomfort/cramping, spurious diarrhoea, confusion and anxiety.

If severe, symptoms can progress to a functional bowel obstruction with either hyperactive (but not obstructed) bowel sounds or a relatively silent abdomen. This can be resolved by treatment of the constipation. It is therefore important to differentiate between constipation and bowel obstruction as, in the latter, the use of stimulant laxatives can cause painful colic.

A skilled assessment is particularly essential when managing people who are dying and includes a history of these symptoms in conjunction with physical examination findings.

General physical examination may elicit nothing abnormal, but it may reveal a palpable and often indentable colon, both right and left sided. A neurological examination should be performed, looking for local deficits or evidence of disorders such as hypothyroidism.

Rectal digital examination is necessary to exclude local disease and assess the consistency and amount of faeces in the rectum. Abnormalities to look for are anal fissures, strictures, masses (e.g., cancers) or haemorrhoids. Digital examination also elucidates whether anal internal sphincter tone is normal. It also gives an indication of the strength of the external sphincter and the puborectalis muscle. Stool amount and consistency can indicate much. More stool is present with colonic inertia for example.

Stool examination is helpful but often impractical. A visual aid such as the Bristol Stool Chart (Figure 2) can, however, be invaluable.

The normal state of the rectum is to be empty. However, in difficult situations, where the rectum is empty and intervention has not produced any result, but constipation is still suspected, an abdominal x-ray may be of use in assessing faecal loading. Stools should be tested for occult blood.

Laboratory studies and colorectal imaging are appropriate when constipation fails to respond to conservative measures – imaging should not be undertaken as an initial investigation. Plain x-rays of the abdomen have been particularly useful in paediatrics, geriatrics and palliative care. Radiography can only be interpreted in conjunction with a full and accurate history though.

Flexible sigmoidoscopy and colonoscopy are the most appropriate methods of identifying narrowings that may exacerbate slowing of the passage of stool. More sophisticated options (e.g., anal manometry, balloon insertion and defecography) are generally not used unless absolutely essential.

Anal manometry is useful in assessing anal sphincter tone as well as pelvic floor strength and hence pelvic floor dysfunction. Balloon insertion is a relatively simple way of demonstrating evacuation – normal volunteers can expel a balloon whereas people with pelvic floor dysfunction cannot. Defecography is self-explanatory really, the rectum is filled with thickened barium and the patient is asked to sit and expel the barium while being monitored.

Constipation is associated with a delayed or prolonged gut transit time so methods of measuring the time are key to an extensive investigation. The various methods range from repeated abdominal radiography looking for bismuth tracers (no longer used because of the radiation doses) to more sophisticated methods such as scintigraphy, radiotelemetry capsules and radio-opaque polythene marker pellets. Coloured markers can be used if radiography is difficult to access but stools need to be examined and possibly sieved to find the pellets as they emerge.

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**Figure 2. Bristol Stool Form Scale. Reproduced with the kind permission of KW Heaton. Tick indicates normal**

Type 1 – Separate hard lumps, like nuts (hard to pass)

Type 2 – Sausage-shaped but lumpy

Type 3 – Like a sausage but with cracks on its surface

Type 4 – Like a sausage or snake, smooth and soft

Type 5 – Soft blobs with clear-cut edges (passed easily)

Type 6 – Fluffy pieces with ragged edges, a mushy stool

Type 7 – Watery, no solid pieces. ENTIRELY LIQUID
Diet, mobility and laxatives can help

Two of the most effective general measures for constipation are to encourage patients to be as mobile as possible, within their limitations, and to ensure they are provided privacy for defecation. One of the most useful things to do initially is to review all medications being prescribed or taken, to ensure all possible iatrogenic causes are minimised.

A review of diet and fluid intake is also an essential step. Very few studies demonstrate the most appropriate dietary advice but common sense dictates an increase in fibre, if possible, will help. Similarly, advice on fluids is helpful. Dehydration is a key risk factor and has been shown to slow transit times in some observational studies. Care needs to be taken not to overload the elderly with fluid however: 1.5L/day is the suggested minimum fluid recommended for the prevention and treatment of chronic constipation.

Laxative use for adult constipation

Laxatives are commonly divided into five broad groups:

- fibre and bulk forming laxatives
- osmotic laxatives
- stimulant laxatives
- stool softeners, lubricants and suppositories
- others.

Fibre and bulk forming laxatives

The most common fibre and bulk forming laxatives are those containing psyllium, bran, methyl cellulose, ispaghula and polycarbophil, and must have been available for some time. They work by increasing the weight and water absorption of stools, so enabling quicker propulsion along the gut lumen. To use these laxatives, patients need to be able to drink a significant quantity of water, so discounting their use in some frail or elderly people.

Flatulence and distension are common accompaniments but this group of laxatives is considered by many to be the first, most effective step in patients with normal transit constipation.

Osmotic laxatives

Osmotic laxatives include mixed electrolyte solutions containing polyethylene glycol (PEG) and non-absorbable sugars such as lactulose and sorbitol.

Lactulose can take up to two or three days to have an effect, so is not suitable for rapid relief of constipation. The osmosis effect is that fluid enters the lumen. To use these, patients need to be able to drink sufficient quantities of water, so discounting their use in some frail or elderly people.

Other drugs with bowel transit effects

Prokinetic drugs have been used to increase gut motility. Primarily used for upper gastrointestinal disorders, cisapride has been shown to promote peristalsis at the colonic level and reduce defecation. Cisapride should no longer be used as a laxative however because of potential side effects and drug interactions.

Newer 5-HT_{3} receptor agonists are potentially effective. Attention is focused on prucalopride (an investigational drug with prokinetic effects) and tegaserod, which is available and stimulates the peristaltic reflex resulting in decreased gut transit time and, therefore, effectively manages some constipation.

Cocaine increases bowel movement frequency and decreases colonic transit time, but its use is not recommended for widespread use.

Misoprostol, a synthetic prostaglandin E, analogue used for prevention and treatment of NSAID-induced peptic ulcer disease, has diarrhoea as a common side-effect. In theory, it should be useful in managing constipation; however, studies have not been helpful to date.

Enemas

Enemas induce bowel movement by distending the colon and rectum. In many palliative care centres, for example, if the faeces are hard, a milk and glycine enema is used.

Phosphate enemas are used for high faecal loading and should only be used as acute treatment for severe constipation when a milk and glycine enema has failed. Phosphate enemas have a laxative effect as a result of their osmotic properties – electrolyte disturbance may occur.

The choice of enema can vary, often depending on cus- tomary practice. They are quite aggressive treatments in the very sick patient, consuming a lot of energy.

If there is no result from the above measures, an overnight oil retention enema (40ml warmed oil per rectum via a long rectal tube; elevate foot of bed to aid retention) should be given to soften the faeces followed by a stimulatory enema the following morning. The efficacy of this is relative to the ability to retain the oil in the rectum.

Stimulant laxatives

Stimulant laxatives produce an increase in peristalsis and mucus secretion. They are probably the most widely used type, despite less their favourable side effect profile.

Most of the stool softeners (senna, cascara and aloes) and dipoxylnmethane cathartics (bisacodyl, sodium picosulphate). Castor oil may be the best known of this group but it is no longer widely used because of adverse effects such as malabsorption and dehydration.

These laxatives, because they stimulate the myenteric plexus, have been the logical choice for the management of opioid-induced constipation. Laxative effect is dose dependent. At high doses, they inhibit water and sodium absorption so, potentially, they can cause disturbing electrolyte imbalances, eg, hypokalaemia.

Bisacodyl is available in oral and rectal forms, the latter being useful for those with outlet delay. Glycine acts as a stimulant when given rectally – glycerol being mildly irritant. Some studies have attempted to identify the most effective stimulant but no clear lead has emerged. No doubt these laxatives will continue to be used widely but attention needs to be directed at their adverse effects to ensure they are minimised.

Stool softeners

Docusate sodium is the most common softening laxative – it also has a weak stimulant effect. It is thought to stimulate intestinal secretions and increase penetration of fluid into faeces, softening the stool. It is often combined with stimulants.

Liquid paraffin is also a softener but is rarely used in clinical practice now because of potential and real side effects such as anal seepage, irritation and lipid pneumonia.

Laxative abuse occurs when someone attempts to lose calories or weight through repeated, frequent misuse. Often, misuse follows eating binges, when the person mistakenly believes the laxative will quickly transit of food and calories through the gut before they can be absorbed. There is a helpful guide to the problems of laxative abuse at www.nationaleatingdisorders.org with information about symptoms and signs, potential problems and management strategies. Generally speaking, if laxative abuse is suspected, referral to specialist services for eating disorders is most helpful.
Childhood constipation is often accompanied by soiling past the age of toilet training. This becomes the dominant complaint with age as peer and social pressures increase. Toilet training difficulties also occur in the presence of constipation.

The definition of constipation in children can vary widely. Traditionally, it is a delay or difficulty in defecation present for two weeks or more but also includes stool hardness and size.

There is a lot of variation in stool firmness and frequency in healthy babies and children. Breastfed babies may pass a stool after each feed or only once every seven to 10 days. Bottle fed babies usually have a bowel movement daily or at least every second day. The normal infant’s stool is of a consistency that allows moulding to the bottom.

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An older child who avoids defecation for fear of further pain. Hard stools can become constipated if he or she ignores the urge to pass stools when busy or fails to fully empty the rectum when appearing unnoticed in the pants when the child relaxes, is asleep, in the bath or shower or after food and exercise. Very soft stool can trickle out past the hard stuff. The child’s physical mobility.

Physical and developmental problems can reduce the stool firmness and frequency. There is a lot of variation in stool firmness and frequency in healthy babies and children. Breastfed babies may pass a stool after each feed or only once every seven to 10 days. Bottle fed babies usually have a bowel movement daily or at least every second day. The normal infant’s stool is of a consistency that allows moulding to the bottom.

Constipation without objective evidence of a pathologi- cal condition is most often caused by a painful bowel movement resulting in voluntary withholding of faeces by a child who avoids defecation for fear of further pain. Hard stools may result in tears to the anal skin and present with red blood on the stool.

Abdominal pain relieved by passing a stool is sometimes a feature. Constipation can also be associated with an increased risk of urinary tract infections, daytime urinary incontinence and bedwetting.

Examination for chronic constipation

Chronic constipation creates anxiety for parents who worry a serious disease may be the cause. Only a small minority of such cases has an organic cause. A detailed history and physical examination is usually sufficient to make a diagnosis of functional constipation. This includes charting height and weight, examining the abdomen and spine, neurological examination of the legs (including tone and reflexes) as well as observation of the anal area. A rectal examination may give information about the quantity and nature of stools in the rectum. Unnecessary rectal examinations are discouraged though and may be left to secondary or tertiary care. Perianal soiling is typically seen in children with stool retention with overflow.

If frequency is less than once every three days, the child is likely to be constipated

Investigations or onward referral are needed only for abnormal physical findings or other symptoms (Panel 1). Interpreted correctly, a plain abdominal x-ray can be a useful tool in the diagnosis of faecal impaction.

Most organic causes present early in life. Long-segment Hirschsprung’s disease usually presents neonatally or in early infancy. Ultrasound short-segment Hirschsprung’s may, however, present later as constipation. The condition has a prevalence of one in 5000, and a definitive diagnosis is made by rectal biopsy to identify aganglionosis. A history of passing very large stools at any stage makes the diagnosis very unlikely.

Functional causes are more common

There are many other possible factors responsible for constipation. These include increased transit time due to slower gut motility – delayed passage of stool through the colon results in harder, drier stools. A poor diet and insufficient fluids can compound the problem.

By the time the child sees the GP the original cause may still occur now and then. The day wetting has stopped. James’ mother comments his appetite is much better and he is a happier child. The GP advises the parents support the programme for as long as needed.

Summary of main referral criteria

- Failure of treatment regimen
- Abnormal physical findings
- Accompanying vomiting
- Failure to thrive
- Blood or mucus in the stool
- Anal stenosis
- A tight empty rectum
- Abnormal leg neurology
- Developmental problems
Treatment of child constipation

Toilet sitting for five minutes in a good position, with the feet raised slightly (Figure 4) – for about 10 minutes after a meal is to be encouraged to take advantage of the gastrocolic reflex. After breakfast or the evening meal, as well as on returning home from school, are good times for some children. Supervision is often needed. Daily bowel diaries recording laxative use, the frequency, size and consistency of stools, and the presence or absence of soiling are useful. The Bristol Stool Chart is helpful; every practice should have one.

For children who soil, regular contact with a supportive professional is needed, as parents need encouragement to maintain a consistent positive attitude with their child. Successful long term treatment requires a family to be well organised, as interventions are time-consuming and patience is needed to put up with gradual improvement and relapses.

If a treatment programme fails, further investigations are needed. Blood tests should include thyroid function, calcium and antibodies for coeliac disease.

Use of medications in children

Many laxatives are available over the counter but in children they should only be used with medical advice. Some are subsidised on prescription. There are no validated protocols for laxotics in children: use in children and their use should be adjusted according to need, with dosages individualised. Basic dosages for some are outlined below.

Stool softeners, and bulking and osmotic laxatives

Lactulose – a synthetic disaccharide – is a commonly used liquid stool softener and is well tolerated by children (dosage 1–3ml/kg/day in divided doses). It can produce flatulence and abdominal cramps and may take up to 48 hours to work.

Polyoxymer oral drops are a softener suitable for children under the age of three years and for babies. Docusate sodium tablets, for older children, are a stimulant and a softener.

Liquid paraffin/mineral oil is not recommended in under one-year-olds or if there is any risk of aspiration (maintenance dosage 1–3ml/kg/day). This is more palatable if chocolate flavoured. Other options not subsidised on prescription include milk of magnesia, macrogol 3350 and sodium picosulphate, which can be flavoured. It is also useful for impaction if used over seven days is available for children of different ages, stopping when disimpaction occurs.

Sodium picosulphate is a powder, mixed with water, that can be flavoured. It is useful for impaction if used over several days in children over two years. It can be used to clear faecal impaction and for maintenance and is good for children with hard stools from the age of two years. Macrogol 3350 takes water through the bowel to the colon, but is used for some years in the UK, Europe and Australia. It can be used with or without a softener. Melanosis coli and antibodies for coeliac disease.

Further resources


Useful websites

Kiwi Enuresis Encopresis Association (KEEA)
www.keea.org.nz
New Zealand Continence Association (NZCA)
www.continence.org.nz
Education and Resources for Improving Childhood Continence
www.encrg.org.nz
Paediatric Society of New Zealand (KidsHealth)
www.kidshealth.org.nz

In children with a more severe problem, a laxative is needed for normal bowel function to return. The laxative dose is often higher than previously advised (see below). Maintenance therapy for six months is recommended before at attempts at weaning off (Figure 3). A regular toiletting programme with behaviour modification techniques and a laxative have been shown to work better than any intervention alone.