Constipation and diarrhoea
Gastro-intestinal problems are common in children. Most are self limiting and clear up without incident. However, they can be serious in some children and may mask underlying disease. This chapter looks at two of the most common problems – constipation and diarrhoea and the role pharmacists can play in their treatment.

Objectives

On completion of this chapter you will

- be familiar with the likely causes of constipation and diarrhoea
- know the best way to resolve such problems
- learn about features that may suggest a more serious underlying illness.
1. Constipation

Constipation is defined as difficulty or delays in passing a stool. By four years of age, a child will normally have one bowel motion a day. Constipation is present if a child aged over four passes fewer than three stools per week or has pain upon defecation, coupled with stool retention.

It is an extremely common condition in paediatric medicine and can affect up to 8% of children. More boys are affected than girls. The reasons for this are unclear but the majority of cases of constipation are likely to be due to lifestyle, including lack of fluid intake, inappropriate diet and behaviour patterns. Other less common reasons include allergy to cow’s milk, Hirschsprung’s disease† and the side effects of medicine such as opiates and anticholinergic agents.

Some constipated children have very infrequent passage of stools, which can lead to a mega colon, impaction and encopresis. Encopresis is the leakage of liquid or soft stool which flows around impacted faeces and results in soiling.

Many health professionals do not approach the treatment of childhood constipation in a structured and logical way. This can lead to chronic problems that may not be resolved for years.

The role of the pharmacist

The influence a pharmacist can have on the treatment of childhood constipation depends on a number of factors. These include the experience, knowledge, enthusiasm and seniority of the individual pharmacist and, for hospital pharmacists, the type of hospital that he or she works in.

One of the most important elements of the pharmacist’s job is to raise awareness of new products and disseminate information about the condition and how it should be treated.

Most specialist children’s hospitals have constipation resource packs for use by health professionals. A pharmacist in such a hospital should be familiar with the local guidelines and ensure that they are adhered to. It is important that new junior doctors are made aware of such guidelines. In these situations, the pharmacist is ideally placed to influence and educate all staff.

In some general hospitals, pharmacists have developed these resource packs for other health professionals, as well as becoming involved in bowel management clinics, and counselling of young patients and their carers or parents.

Many laxative drugs are available for children over the counter. However the use of these drugs in children should be discouraged, unless prescribed by a doctor. Community pharmacists should, however, provide information on side effects and appropriate administration of the prescribed medicine.

Education and behaviour therapy

Most of the children seen in hospital bowel management clinics have had chronic constipation for months or years. The good news is that the majority of these children will be problem free within 12 months. There is no ‘quick fix’ for long-term childhood constipation. It is best not to be dogmatic in the choice of laxatives or doses or in the form of help to be offered. A flexible approach is required that includes detailed explanations and the use of behavioural therapy.

The staged approach

The medicines given may have been used by the patient previously but a multi-disciplinary and sustained approach will produce results.

The staged approach consists of:

- stool softening
- clearing out impacted faeces
- maintaining normal bowel function.
1.1 Stool softening

An increase in fibre and fluid is one of the first lifestyle changes that should be recommended. Children should be encouraged to drink plenty of water with all meals, as well as apple juice or prune juice. More fruit and vegetables should be introduced but in a manner which avoids confrontations at meal times.

Only two stool softeners are recommended for the majority of patients – lactulose and docusate.

**Lactulose**

Lactulose is metabolised in the gut to acetic and formic acids that promote bacterial growth and increase faecal bulk and softness. Lactulose is described as a bulk forming osmotic laxative. It should be taken with plenty of water.

It is pleasantly sweet tasting and suitable for long-term use. However, it takes at least 48 hours to work. Lactulose should be used for 5-7 days to soften stool bulk before introducing clear out medicines.

<table>
<thead>
<tr>
<th>Doses of lactulose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Dose</td>
</tr>
<tr>
<td>Times/day</td>
</tr>
</tbody>
</table>

Parents or carers must be told to increase or decrease the dose of lactulose according to response when it is used in the longer term. However, the dose should never be reduced to zero without first discussing this with a health professional involved with the patient. This approach will help compliance in the longer term.

**Activity 6.1**

The mother of a 10 year old claims that lactulose alone does not help his constipation. What would you recommend?

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**Docusate sodium**

Docusate sodium is a softening agent which acts as an emulsifier to break up hardened faecal mass. It may be diluted with milk or squash and is sugar free.

Docusate adult solution contains 50mg in 5ml and docusate paediatric solution contains 12.5mg in 5ml.
1.2 Clear out medicines

As explained previously, a clear out medicine should be used following 5-7 days treatment with a stool softener. In community pharmacy, Movicol-Half sachets or Picolax sachets are normally used. In hospital, it may necessary to use Klean-Prep or enemas. A manual clearout may be required for some seriously impacted children.

**Movicol Paediatric Plain**

Movicol Paediatric Plain contains macrogol 3350 and electrolytes, and acts as an osmotic laxative. The electrolytes are present to ensure that there is no net loss, or gain, of sodium or potassium.

<table>
<thead>
<tr>
<th>Doses of Movicol Paediatric Plain (sachets per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>1.2 years</td>
</tr>
<tr>
<td>2–4 years</td>
</tr>
<tr>
<td>5–11 years</td>
</tr>
<tr>
<td>Dose</td>
</tr>
<tr>
<td>day 1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>day 2</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>day 3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>day 4</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>day 5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>12</td>
</tr>
</tbody>
</table>

The contents of each sachet should be dissolved in 62.5ml of water. The daily number of sachets should be taken over a period of 12 hours. The above regime must be discontinued after disimpaction has occurred.

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**Activity 6.2**

A prescription for a three-year-old is written as "Movicol 2 sachets daily". What would you do?

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**Picolax**

Picolax is a combination of sodium picosulphate and magnesium citrate, and is described as a bowel cleaning solution. Its mode of action is a combination of a stimulant and an osmotic laxative.

<table>
<thead>
<tr>
<th>Doses of Picolax</th>
<th>Age</th>
<th>1-2 years</th>
<th>2-4 years</th>
<th>4-9 years</th>
<th>over 9 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose times/day</td>
<td>quarter sachet twice a day</td>
<td>half sachet twice a day</td>
<td>one sachet morning and half sachet afternoon</td>
<td>one sachet twice a day</td>
<td></td>
</tr>
</tbody>
</table>

Patients should be prescribed 4-6 doses and the treatment discontinued after disimpaction has occurred.

### 1.3 Other products

If the above products have failed to disimpact, the following alternatives can be tried.

**Klean-Prep**

The use of this product requires considerable co-operation from the child as a large volume must be consumed to produce an effect.

Dosage of Klean-Prep is 25ml/kg every hour until rectal effluent is clear which can take 4-10 hours. In some cases the nasogastric route may have to be used.

**Micralax Enema**

Children over three years of age may be given the total contents of one enema. The onset action is 15-30 minutes and treatment should be repeated after 24 hours if necessary.

**Liquid paraffin**

This product is useful if patients have not responded to other therapy. Do not give to children under three years old.

The dose of liquid paraffin for 3-12 years old is 0.5-1ml/kg (max dose) and for 12-18 years old 10-30ml. This should be given once a day in the evening.

### 1.4 Maintenance medicine

Most patients require a combination of at least two maintenance medicines for a long period, typically lactulose and senna for one year. Lactulose is covered above under stool softening.

**Senna**

Senna is a stimulant laxative and must not be given until a chronically constipated child’s stools have been softened. It takes 8-12 hours to have an effect and is therefore usually given once at bedtime. Some children may benefit more from a morning dose of senna.

<table>
<thead>
<tr>
<th>Doses of senna</th>
<th>Age</th>
<th>1 month-2 years</th>
<th>2-6 years</th>
<th>6-12 years</th>
<th>12-18 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose (liquid)</td>
<td>0.5ml/kg</td>
<td>2.5-5ml</td>
<td>5-10ml</td>
<td>10-20ml</td>
<td></td>
</tr>
<tr>
<td>Dose (tablets)</td>
<td>not recommended</td>
<td>not recommended</td>
<td>1-2</td>
<td>2-4</td>
<td></td>
</tr>
</tbody>
</table>

Parents or carers may be told to increase or decrease the dose according to responses.
2. Diarrhoea

Diarrhoea and other conditions such as vomiting and abdominal pain are common symptoms of gastrointestinal disorder in childhood. In many instances, such illnesses are self limiting and resolve rapidly without signifying serious underlying disease. However, some aspects of the clinical history should raise concern and prompt medical referral.

Worrying pointers include:

- chronicity of symptoms (persistence for more than two weeks)
- associated weight loss or poor growth
- poor sleeping/nocturnal waking
- recurrent interruption of normal activities (e.g. missing school)
- a family history of gastrointestinal illness with similar symptoms (e.g. pyloric stenosis, coeliac disease, inflammatory bowel disease, peptic ulcers).

2.1 Acute diarrhoea

Diarrhoea can be defined as the frequent passage of watery stools. During short-lived episodes of acute onset diarrhoea, the main risk to the child is dehydration and associated electrolyte disturbance. Infants under six months are at greatest risk of dehydration because they have increased insensible fluid losses and, when formula fed, receive a large osmotic and high renal solute load.

Causes
Acute sickness and diarrhoea is usually infectious in origin. The infecting organisms are:

- viral – this is the most common cause and includes rotavirus, adenovirus, Norwalk agent
- bacterial such as salmonella, shigella, campylobacter, E. coli
- protozoal (for example, Giardia lamblia).

Quite often, no pathogen can be isolated from stools in children admitted to hospital with diarrhoea. It should be remembered that, in the young child, extra-intestinal sepsis might cause acute sickness and diarrhoea.

Worrying features that should suggest a diagnosis other than acute, viral gastroenteritis include:

- a generally unwell child
- abdominal pain (possible surgical problem, e.g. appendicitis or intussusception)
- bloody stool (possible intussusception or haemolytic uraemic syndrome).

Management
The most important principle of management in the child with acute diarrhoea is prevention or correction of dehydration with its associated electrolyte disturbance, together with maintenance or resumption of adequate nutritional intake.

There is no role for anti-diarrhoeal drug therapy, such as loperamide, which simply masks underlying fluid losses. Based on the discovery that glucose stimulates sodium transport in the small intestine, glucose and electrolyte solutions (GESs) have become widely available. Substitutes such as home made salt and sugar solutions are notoriously inaccurate. Popular soft drinks are hyperosmolar and may provoke an osmotic diarrhoea.

In Europe, GESs containing around 60 mmol/l of sodium are recommended (e.g. Dioralyte, or Dioralyte Relief, which contains rice powder rather than glucose). Unfortunately, it is still often the case that children admitted to hospital with gastroenteritis have not been offered GES while at home.
Introduction to paediatric pharmaceutical care

Activity 6.3

Look at the rehydration solutions you have available in your pharmacy. List the contents in 1000ml of solution when made up as described and compare them.

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The majority of children can be treated safely in the community but there should be a lower threshold for admission to hospital for infants under six months. Small amounts of fluid given frequently are often tolerated, even when vomiting (from gastric stasis†) has been a prominent symptom.

Activity 6.4

Jennifer, a two year old girl, has been unwell for two days with diarrhoea. Her mum asks what you would advise for her as she is now vomiting too. On questioning mum, you consider that Jennifer has gastroenteritis and is at risk of dehydration. How would you advise her?

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Maintenance fluid requirements are:

• 100ml/kg/day for the first 10kg body weight
• + 50ml/kg/day for the next 10kg body weight
• + 20ml/kg/day for remaining body weight.

These requirements should be supplemented if the child has frequent or substantial watery stools, or vomits, by an additional 10ml/kg per stool/vomit.

Children with gastroenteritis do not need to be ‘starved’ during the illness. Normal formula feeds can be introduced following an initial four hour period of rehydration. Breast-feeding should continue through rehydration and maintenance phases of treatment. In children who are weaned, normal fluids and solids can be reintroduced after rehydration. If there is persistent diarrhoea after reintroduction of feeds, lactose intolerance or cow’s milk protein intolerance should be considered.
Considerations that would indicate the need for hospital admission include:

- signs of dehydration, or uncertainty about state of hydration e.g. an obese child
- vomiting of GES, or inability to comply with oral rehydration advice for whatever reason (often poor social circumstances)
- persistence or recurrence of diarrhoea
- suspected surgical conditions
- short history of profuse diarrhoea
- pre-existing medical condition which may worsen with diarrhoea e.g. diabetes.

Activity 6.5

List the symptoms of dehydration that you may see in an infant or child.

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2.2 Chronic diarrhoea

Chronic diarrhoea, lasting more than two weeks, particularly if associated with weight loss, needs hospital investigation. There is a long differential diagnosis which includes coeliac disease (gluten sensitive enteropathy) and inflammatory bowel disease (i.e. Crohn’s disease, ulcerative colitis). A family history of these conditions should increase diagnostic suspicion.

Toddler diarrhoea typically occurs in the second year of life and is associated with undigested food such as peas and carrots in the stools. The child is well and growing normally. It is thought to relate to a rapid intestinal transit time and sometimes follows infective gastroenteritis. A high intake of sugary drinks or fruit juices can exacerbate this kind of diarrhoea, whereas increasing dietary fat intake can have a beneficial effect. Drug treatment is unnecessary, although loperamide can help where “something needs to be done,” for example in a child who is being excluded from nursery.