

Management of IID in Primary Care

Gastroenteritis is a common reason for presentation in General Practice. On the Island of Ireland, 4.5% of the population present to their GP with gastroenteritis each month.⁸ This represents 8,800 episodes of gastroenteritis every day (or 3.2 million episodes per year). Each patient will, on average be unwell for four days. In terms of workload in Ireland and Northern Ireland, this translates into 3,100 GP consultations per day (or 1.1 million per year). Sixty four thousand stool samples will be submitted from the community each year and 1.5 million working days will be lost due to absences related to gastroenteritis (this equates to €173.5 million on the island of Ireland in lost earnings alone). On average, GPs have seven consultations for acute gastroenteritis per week, accounting for 4.5% of all consultations. The importance of gastroenteritis lies in its potential clinical severity coupled with the fact that most gastroenteritis pathogens are contagious, meaning a single case can transmit to many people. The great majority of cases of IID are managed successfully in primary care; such cases have self-limiting and mild illnesses that require no specific treatment.

Additionally, a significant number of cases of gastroenteritis will present to Emergency Departments (EDs). Because of the high risk of onward transmission of certain gastroenteric pathogens such as norovirus, it is not desirable that uncomplicated and straightforward cases of IID are managed, in the first instance, in EDs. Nevertheless, severe or complicated cases of gastroenteritis will often require hospital management. Should patients present to the Emergency Department with diarrhoea or vomiting, the principles relating to enteric precautions and initial identification and management of uncomplicated cases laid out in this document apply. More severely ill or complex cases require specialist intervention. In this case, individual patient management will be beyond the scope of this guidance document.

The following definitions regarding the duration of diarrhoea provide a useful basis for considering the potential underlying causes:⁹

- *Acute*: ≤14 days duration
- *Persistent*: 14-30 days duration
- *Chronic*: > 30 days duration

Most cases of uncomplicated, acute infectious diarrhoea in immunocompetent individuals (whether caused by bacteria, viruses or parasites) tend to have a duration of less than 14 days. Diarrhoea that is persistent or chronic, in immunocompetent individuals, suggests a non-

infectious aetiology. In a clinical setting, therefore, it is important to identify early those cases of diarrhoea that are more likely to have an infectious aetiology (p20).

1. Aetiology

Most cases of acute infectious diarrhoea will be viral in origin (norovirus, the cause of winter vomiting disease, rotavirus, the commonest cause of infantile and paediatric gastroenteritis and other, less common viruses such as adenovirus and astrovirus). Bacterial causes tend to produce more severe diarrhoeal disease; gastroenteritis lasting more than three days in most likely to be bacterial (or protozoal in nature).

Different pathogens exert their pathogenic effects in different portions of the gastrointestinal tract. Small bowel involvement tends to be seen with norovirus and rotavirus; with *Salmonella**, VTEC, *Staphylococcus aureus*, *Bacillus cereus*, *Vibrio cholerae*, and *Clostridium perfringens*; and with *Cryptosporidium** and *Giardia*. Colonic involvement tends to occur with adenovirus; with *Campylobacter**, *Shigella*, *Clostridium difficile* and *Yersinia*; and with *Entamoeba histolytica* (*can affect both large and small bowel).

2. Clinical Evaluation

A careful history and examination can provide valuable clues as to the clinical and public health management of cases of gastroenteritis.

2.1. History

Initial assessment of patients presenting with acute gastroenteritis should include a careful history to determine the symptom duration and onset¹⁰.

- onset of symptoms within 1-2 hours of food consumption/exposure suggests a bacterial enterotoxin such as that produced by *Staphylococcus aureus* or *Bacillus cereus*
- onset of symptoms that begin between 6 and 18 hours suggest *Clostridium perfringens* intoxication
- symptom onset greater than 18 hours suggest the commoner bacterial causes of gastroenteritis
- stool frequency (diarrhoea is defined as three or more liquid stools per day¹¹, severe diarrhoea is six or more liquid stools per day)
- stool character (watery/bloody). Watery diarrhoea (see [Glossary](#)) refers to the consistency and not the colour of the stool

Are there epidemiological clues as to the cause?

- other family/friends/colleagues with similar symptoms
- are there indicators as to a foodborne aetiology (recent wedding, eating out etc),¹²

8. Acute Gastroenteritis in Ireland, North and South A Telephone Survey (2003). Available at <http://www.hpsc.ie/hpsc/A-Z/Gastroenteric/GastroenteritisorIID/Publications/AcuteGastroenteritisinIrelandNorthandSouth>.

9. Guerrant RL, Van Gilder T, Steiner TS, et al. Practice guidelines for the management of infectious diarrhea. *Clin Infect Dis* 2001; 32:331.

10. See appendix 3 for a list of incubation periods and typical periods of duration for common gastrointestinal pathogens

11. World Health Organization. Available at <http://www.who.int/topics/diarrhoea/en>.

- recent animal contact
- consumption/contact with untreated water e.g. swimming in lakes/ponds, consumption of well water)?

The form and severity of symptoms depend on the type and quantity of pathogen or toxin ingested, coupled with the general health of the patient. The diagnosis of gastroenteritis is usually apparent from the symptoms, which tend to be quite suggestive. The cause may be suggested by the history. Toxins have the shortest incubation periods (a matter of hours), viruses become clinically apparent in a day or two, bacteria tend to have incubation periods that range from a couple of days to a number of weeks (see Appendix 3 for further details).

Viral pathogens can produce extensive epidemics. Those caused by rotavirus (largely children under the age of six but occasionally in the elderly) tend to be more circumscribed and are commonest in healthcare and childcare settings while outbreaks of norovirus (winter vomiting illness), which can be very extensive, are seen in almost any setting but most commonly in hospitals, long-stay institutions, hotels and cruise ships. Viral gastroenteritis tends to produce quite watery diarrhoea.

Bloody diarrhoea strongly indicates bacterial infection (VTEC or *Shigella* but also *Salmonella* and *Campylobacter*). Fever suggests an invasive bacterial cause. Patients with bacterial gastroenteritis frequently feel very unwell with anorexia, malaise and weakness.

Infectious Diarrhoea: It is clinically important to differentiate, at any age, between those episodes of diarrhoea that may be of an infectious nature and those suggestive of inflammatory bowel disease or a discrete lesion. If a patient presents to primary care with diarrhoea, a careful history can be useful in differentiating between an infectious and a non-infectious aetiology.

Table 2: Assessment of Likelihood of Diarrhoea being Infectious in Origin¹³

Feature	History	Significance
Contact	Has the patient had contact with another case of diarrhoea or bloody diarrhoea?	If so this would support an infectious aetiology (but does not out rule a non-infectious source).
Exposures	Ask about exposures that would plausibly suggest an infectious aetiology?	For example: recent visit to petting zoo, or recent unusual contact with farm animals or consumption of well water (these are all well described risk factors for VTEC).
Recent Symptoms	Has the patient been well in recent weeks?	Infectious diarrhoea is usually acute, non-infectious diarrhoea tends to be rather less acute in onset.
Abdominal Pain	How severe is the abdominal pain?	Pain out of proportion to the severity of the diarrhoea is more indicative of an infectious aetiology.
Pyrexia	Is the patient febrile?	Although not a universally present sign of infectious intestinal disease, pyrexia is strongly suggestive of an infectious aetiology (pyrexia is a variable sign in children with VTEC infection: in adults with VTEC, pyrexia is uncommon).
Urinary Output	Is the patient oliguric?	Oliguria (or anuria) suggests dehydration. In the absence of dehydration, oliguria (especially in a child and particularly if accompanied by bloody diarrhoea) suggests the possibility of HUS.
Bloody Stools	If stool is bloody, what is the nature of the blood staining?	If blood is mixed through a liquid stool, this suggests an (infectious) haemorrhagic colitis (VTEC being the most important cause but <i>Salmonella</i> and <i>Campylobacter</i> are also relatively common causes, bacillary dysentery is another, less common cause); blood streaking of a solid stool's surface suggests a benign rectal bleed, commonly from haemorrhoids or an anal fissure.

12. See Appendix 4 for a list of foods with which particular pathogens are most frequently associated

13. Adapted from: Pollock KG, Stewart A, Beattie TJ, Todd WT, Ahn CK, Tarr PI, Cowden JM. From diarrhoea to haemolytic uraemic syndrome - when to seek advice. *J Med Microbiol.* 2009 Apr;58(Pt 4):397-8.

Bloody Diarrhoea: Bloody diarrhoea is a medical emergency at any age, but especially so in children under 15 years of age. In the developed world, bloody diarrhoea in children is 15-20 times more likely to be caused by intestinal infection than by inflammatory bowel disease (Wood, 2008). Any child presenting with bloody diarrhoea should be strongly suspected as having VTEC infection until proved otherwise, as VTEC is the commonest cause of haemorrhagic uraemic syndrome (HUS). HUS is an important cause of childhood renal failure. All paediatric cases of bloody diarrhoea should be assessed urgently.

Other Cases: Other family members/friends/colleagues may have had similar symptoms, suggesting the possibility of an outbreak. There may be an indication of a common point source (such as contaminated water or a meal at a wedding or a restaurant).

Foreign Travel. It is crucial to enquire as to the possibility of foreign travel.

2.2. Examination

The appearance of the patient and their state of hydration will give important pointers as to further management.

Do they appear well?
Are there signs of dehydration (e.g., diminished skin turgor, delayed

Examination

- **Looks unwell?**
- **Dehydration/Shock**
- **Tachycardia/tachypnoea**
- **Blood pressure**
- **Abdominal tenderness**
- **Pyrexia**

capillary refill time, low blood pressure, dry mucosal membranes/eyes, orthostatic hypotension, postural hypotension [see Appendix 6 for assessment of severity of dehydration in children])?

Severe illness (implying the possibility of invasive bacterial disease) would be suggested by one or more of the following features:

- Profuse watery diarrhoea with signs of hypovolaemia or impending shock
- Pyrexia $\geq 38.5^{\circ}\text{C}$
- Bloody diarrhoea (blood mixed through, not coating, the stool – a medical emergency especially in children, the elderly and the immunocompromised)
- Duration of symptoms >48 hours
- Severe abdominal pain (focal abdominal tenderness with rebound is suggestive of an inflammatory condition)
- recent history of antibiotic use in hospitalized patients

While degree of hydration is an important and useful pointer in the clinical management of adult cases of gastroenteritis, hydration is a vital sign in children (see Appendix 7).

Differential Diagnosis:

- **Appendicitis:** it is important to bear in mind that (especially in children) appendicitis can present with symptoms and signs suggestive of gastroenteritis and even if there is no sign of an acute abdomen at the time of the examination - be prepared to repeat the examination as signs can appear later.
- **Mesenteric adenitis** often preceded by a viral pharyngitis in children can also mimic an acute abdomen or early gastroenteritis. If the abdomen is distended, listen for bowel sounds.
- **Meningitis:** it is vital to outrule meningitis (nuchal rigidity, altered level of consciousness, non-blanching rash, peripheral shutdown)
- Occasionally, urinary tract infection, pneumonia, otitis media or septicaemia may present with diarrhoea and/or vomiting.

If **ANY** of the following are present,¹⁴ consider an alternative diagnosis to IID:

- Fever:
 - Temperature of 38°C or more in children younger than 3 months of age
 - Temperature of 39°C or more in children 3 months of age or older
- Shortness of breath or tachypnoea
- Altered conscious state
- Neck stiffness
- Bulging fontanelle in infants
- Non-blanching rash
- Blood and/or mucus in stool
- Bilious (green) vomit
- Severe or localized abdominal pain.
- Abdominal distension or rebound tenderness

Appendices 5 and 6 outline the clinical approach to adult and paediatric cases of acute diarrhoea, respectively, while Appendix 8 outlines the clinical features of infection with selected diarrhoeal pathogens.

14 . NICE (2009) Diarrhoea and vomiting in children under 5 (NICE guideline). Available at <http://www.nice.org.uk/guidance/CG84/NiceGuidance/doc/English>.

Microbiological Stool Examination: Microbiological stool examination is not necessary in every case of gastroenteritis, but there are certain instances where this may be indicated for clinical and/or public health reasons:

- Where features indicate the **clinical need**:
 - Severe illness
 - Bloody diarrhoea
 - Fever
 - Constitutional symptoms lasting > 5 days
 - Diarrhoea lasting > 5 days
 - Co-morbidity that is likely to result in complications (e.g. concomitant inflammatory bowel disease or medically complicated cases where the diagnosis is in doubt).
- If the patient is **very young** (i.e. a baby/small child) or **very elderly**.
- In general, patients who are known to be **moderately or severely immunosuppressed** (due to untreated AIDS, disseminated carcinomatosis or immunosuppressive or anti-cancer therapy) are at risk of prolonged severe gastroenteritis from the common pathogens (including *Campylobacter*, *Salmonella*, *Cryptosporidium* and VTEC). On presentation, such patients should have their stool routinely examined for the common bacterial and parasitic pathogens.
- Where there is a public health risk because the patient is in a **Risk Group** (page 11).
- Where there is a public health risk because the case may be part of an **outbreak** (have there been other cases of similar illness among family members, work colleagues, friends with whom the patient socialised or dined?).

Investigation

Submit a stool sample if:

- **Clinical need**
- **Very young/old**
- **Immunocompromised**
- **Risk Group**
- **? Part of an outbreak**

The above is a general rule-of-thumb; under certain specific circumstances (e.g. during active case finding as part of an outbreak investigation) it may be necessary to sample much more widely.

It is important that all practitioners acquaint themselves with the local testing regimes for stool samples in their local laboratory.

3. Clinical Management

In order to facilitate management and to remove some of the uncertainty that surrounds the diagnosis of gastroenteritis, the following are intended as clinical and public health pointers. In general, from the perspective of the general public, all cases of diarrhoea should be considered to be infectious and patients presenting with diarrhoea should be urged to remain off work until they are symptom-free for 48 hours.

The causative agent for most cases of gastroenteritis is never identified; management is not usually dependent upon cause. In the vast majority of cases, gastroenteritis (regardless of the origin) will resolve spontaneously on simple measure such as:

- General supportive measures
- Maintenance of hydration.

Fasting is not necessary if the patient feels able to eat. Patients should avoid spicy and fatty food until their bowel habits have returned to normal.

The initial management of patients with gastroenteritis involves the use of general supportive measures (including rest if severe illness), alteration of diet (typically brief fasting) and maintenance of hydration.

Management + Advice

- **No antidiarrhoeals**
- **No antibiotics unless specific indication**
- **Rehydration**
- **Enteric hygiene advice**
- **Work/school exclusion**

3.1. Hydration

The most decisive intervention in the management of gastroenteritis is the use of appropriate rehydration measures, preferably by the oral route and using solutions that contain water, salt and sugar,¹⁵ especially if the patient has frequent or severe diarrhoea or is vomiting. Oral rehydration is particularly valuable in the management of paediatric gastroenteritis.

There is compelling evidence that oral rehydration therapy is underused in the developed world. It is estimated that appropriate use of this form of rehydration could reduce paediatric admissions in the US by 100,000 hospitalisations per year.¹⁶ Oral Rehydration Solutions (ORS) containing glucose and sodium chloride permit effective rehydration because, even in those conditions that affect the mucosa of the small bowel, the intestine maintains its ability to absorb water if glucose and salt are present, as these compounds promote the transport of water from the intestinal lumen. ORS are available in commercially prepared sachets

The World Health Organization recommends that ORS should be used in the prevention and treatment of dehydration due to diarrhoea. The WHO recommends the following formulation for ORS: Sodium Chloride (2.6g), Trisodium Citrate Dihydrate (2.9g), Potassium Chloride (1.5g) and Anhydrous Glucose (13.5g) reconstituted using one litre of potable water.¹⁷

15. Wanke CA. Approach to the adult with acute diarrhoea in developed countries. UpToDate available at <http://www.uptodate.com/contents/approach-to-the-adult-with-acute-diarrhea-in-developed-countries>

16. Santosham M, Keenan EM, Tulloch J, et al. Oral rehydration therapy for diarrhea: an example of reverse transfer of technology. *Pediatrics* 1997; 100:E10.

17. World Health Organization. Monographs: Dosage forms: Specific monographs: Sales perorales ad rehydratationem - Oral

It is important for the patient to re-establish normal eating patterns as soon as possible. Adequate nutrition is important to ensure renewal of enterocytes and a return to healthy absorption and transport of salts and nutrients.

Hydration is a key pointer in the assessment of children (and, to a lesser extent, in adults) with diarrhoea. The Centers for Disease Control and Prevention guidance relating to rehydration in the management of acute gastroenteritis among children¹⁸ indicates that oral rehydration therapy is the preferred treatment of fluid and electrolytes lost by diarrhoea in children with mild-to-moderate dehydration.

3.2. Anti-diarrhoeal Therapy

There is no clinical indication for the use of anti-diarrhoeal and anti-emetic medication in the management of acute gastroenteritis.

3.3. Antibiotics

Antibiotics are **only very rarely indicated** for the treatment of diarrhoea since the illness is usually self-limiting. They should be reserved for special circumstances where there is evidence of invasive enteric bacterial disease or other special circumstances, such as antiprotozoal treatment of giardiasis. In general, a decision to prescribe antimicrobial agents for diarrhoea should be taken in consultation with a Consultant in Public Health Medicine, a Consultant Microbiologist or Infectious Disease Physician and should be reserved for severe invasive bacterial disease. In general patients who require antibiotic therapy for suspected invasive disease are likely to require hospital assessment. Antibiotic resistance in bacteria associated with diarrhoea is an increasing concern therefore, wherever possible, choice of antibiotic should be dictated by definitive identification of the specific bacterium and its sensitivity profile. Typhoid and Paratyphoid deserve special mention as they require treatment with antibiotics but generally present with systemic disease, gastrointestinal presentation being very common.

3.4. Enteric Hygiene Advice

The following advice should be offered to **all** cases of gastroenteritis:

1. **Handwashing:** thorough handwashing with soap and warm water is the most effective way of preventing spread of enteric pathogens. This is particularly important for

healthcare workers, food handlers and those working with the elderly and the young.

2. **Disposal:** At home, sick people should normally use a flush toilet. Bedpans, commode pans and urinals should be emptied into the toilet bowl and then washed with hot water and detergent. Soiled clothing and bed linen should be washed separately from other clothes in a domestic washing machine at the highest temperature that they will tolerate (see page 13).
3. **Spillages:** spillages and contamination with faeces or vomitus should be cleaned immediately. Full information on cleaning and decontamination is available on the [HPSC's website](#).
4. **Education:** patients should be educated in the hygienic preparation and serving of food (**safefood** have excellent [resources](#) on their website).
5. **Exclusion:** Any patient who presents with diarrhoea and/or vomiting from any infectious cause should not return to work for 48 hours after resolution of their symptoms. Patients continue to shed pathogens for that first 48 hours and are at risk of introducing infection into the workplace. In the case of more serious illness such as shigellosis, VTEC infection and typhoid, your local Department of Public Health can advise on the requirements regarding exclusion.
6. **Exposure prone Groups:** these are group who are at greater risk of **contracting** a particular infectious intestinal disease due to their being more likely to come into contact with a particular pathogen; these vary depending on the disease in question (exposure prone groups for each pathogen are listed in the relevant pathogen's section). Such groups should be targeted with enteric hygiene advice to reduce the likelihood of contracting disease.
7. **Vulnerable Groups:** these are groups which, following exposure, have an **increased likelihood of developing severe disease**. They include:
 - The very young
 - The very old
 - The most marginalised in society and
 - Those with weakened immune systems, and include patients taking immunosuppressive medication (such as anticancer medication or steroids) and those with chronic disease that weakens the immune system including HIV/AIDS.

As such groups are at risk of severe disease, they should be actively targeted with enteric hygiene advice to reduce of contracting disease.
8. **Risk Groups:** (p11) Risk Groups differ from Vulnerable Groups. Risk Groups pose a greater than average risk of **transmitting** infectious intestinal disease. These include:

rehydration salts. Available at:

<http://apps.who.int/phint/en/p/docf>. Accessed 20/7/2011.

18 . King CK, Glass R, Bresee JS, Duggan C; Centers for Disease Control and Prevention. Managing acute gastroenteritis among children: oral rehydration, maintenance, and nutritional therapy. MMWR Recomm Rep. 2003 Nov 21;52(RR-16):1-16.

- High-risk food handlers
- Healthcare and childcare workers
- Children under the age of 5 and
- Individuals with poorly developed personal hygiene.

These individuals should be targeted with hygiene advice and may require extended periods of exclusion depending on which pathogen is responsible for their illness. Stool samples should always be considered in individuals falling into these Risk Groups. If in doubt, discuss with your local Consultant in Public Health Medicine.