

In The Name Of God

Diarrhea

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Introduction

- Definition: Three or more episodes of loose stool or any loose stool with blood during a 24-hour period.
- Acute <2 weeks' duration, Persistent lasts >14 days, Chronic lasts >30 days
- Most cases of diarrhea will be acute and self-limiting
- What we need to know:
 - Age: Infant, child, adult, elderly
 - Duration
 - Severity
 - Other associated symptoms
 - Other family members affected?
 - Previous history
 - Recent travel?
 - Medication

When to refer patients with diarrhea?

- Duration of Diarrhea

1 day's if patient is < 1 year

2 days if patient is < 3 years and elderly patients

3 days in older children and adults

- with severe vomiting

- with fever

- with a Medications

- Presence of blood or mucus in the stools

- signs of dehydration in babies: dry skin, sunken eyes and fontanelle, dry tongue, drowsiness, less urine than normal.

Symptoms of Acute diarrhea

- Rapid in onset and produces watery stools
- Abdominal cramps
- Flatulence
- Weakness or Malaise
- Nausea & Vomiting
- Fever
- The presence of blood or mucus in the stools

The pharmacist should always ask about vomiting and fever in infants; both will increase the likelihood that severe dehydration will develop.

Previous history

- Chronic diarrhea (>3 weeks' duration) may be caused by bowel conditions such as IBD, IBS and requires further investigation
- Although, diarrhea in a patient who has recently travelled might be infective in origin but it requires referral

Some drugs that may cause diarrhea

Antacids: Magnesium salts

Iron preparations

Laxatives

Antibiotics

Digoxin (toxic levels)

Selective serotonin reuptake inhibitors (SSRIs)

Infectious diarrheas

1) Noninflammatory diarrheas

- Nonbloody, watery stools; patients are afebrile and without significant abdominal pain
- No WBC or occult blood
- Most patients with noninflammatory diarrheal illnesses require only supportive therapies.
- Typically caused by
- Rotaviruses, noroviruses, Staphylococcus aureus, Bacillus cereus, Clostridium perfringens, Cryptosporidium parvum, and Giardia lamblia.

Infectious diarrheas

2) inflammatory diarrhea

- more severe illness in which patients present with bloody diarrhea, severe abdominal pain, and fever
- examination of stool specimens reveals large numbers of fecal leukocytes.
- Selected persons with inflammatory diarrheal illnesses may benefit from antimicrobial therapy directed at the causative pathogen
- Inflammatory diarrheas are caused by invasive pathogens including *Campylobacter jejuni*, *Shigella* species, *Salmonella* species, *Clostridium difficile*, Shiga toxin-producing *Escherichia coli* (STEC) & *Entamoeba histolytica*..

Causes of Infections diarrhea


Viral

Viruses are often responsible for gastroenteritis

- Starts abruptly
- Vomiting often precedes diarrhea
- The acute phase is usually over within 2–3 days, although diarrhea may persist
- Diarrhea returns when milk feeds are reintroduced. This is because one of the milk digestive enzymes is temporarily inactivated. Milk therefore passes through the bowel undigested, causing diarrhoea.
 - It is usually not too severe and is self-limiting (except malnourished, not been breastfed)

Bacterial

- These are the food-borne infections previously known as food poisoning.
- There are several different types of bacteria that can cause such infections:
- *Staphylococcus*,
- *Campylobacter*,
- *Salmonella*,
- *Shigella*,
- pathogenic *Escherichia coli*,
- *Bacillus cereus* and *Listeria monocytogenes*.

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- Shigella infection associated with bacillary dysentery
 - B. cereus is usually associated with cooked rice, especially if it has been kept warm or has been reheated.
 - E. coli infections are less common but can be severe with toxins being released into the body
 - Antibiotics are generally unnecessary as most food-borne infections resolve spontaneously.
 - The most important treatment is adequate fluid replacement
 - Antibiotics are used for Shigella infections and the more severe Salmonella or Campylobacter ones
 - Ciprofloxacin used in such circumstances

Protozoan infections

- *Entamoeba histolytica* (amoebic dysentery) and *Giardia lamblia* (giardiasis)
- Diagnosis is made by sending stool samples to the laboratory

Features of some infections causing diarrhea

Infection	Incubation	Duration	Symptom
Staphylococcus	2–6 h	6–24 h	Severe, short-lived especially vomiting
Salmonella	12–24 h	1–7 days	Mainly diarrhea
Campylobacter	2–7 days	2–7 days	Diarrhoea with abdominal colic
Bacillus cereus	1–5 h	6–24 h	Vomiting
Bacillus cereus	8–16 h	12–24 h	Diarrhoea

Traveller's diarrhoea

- early onset, usually within first 3 days of trip
- normally of short duration: mean 4 days, maximum 7 days
- bloody diarrhoea in about 15% of cases
- other symptoms as for acute diarrhoea.

Table 12.1 Diarrhoea: differential diagnosis

Feature	Significance	Possible indication
Frequency and nature of stools	Rapid onset. Watery stools, passed frequently	Acute diarrhoea Traveller's diarrhoea
	Blood and/or mucus in stool	Traveller's diarrhoea Inflammatory bowel disease
Occurrence	Isolated occurrences	Acute diarrhoea
	Recurrent	Traveller's diarrhoea Chronic diarrhoea
Duration	Resolves spontaneously within 72 hours	Acute diarrhoea
	Resolves within 7 days	Traveller's diarrhoea
	Continues beyond 7 days	Chronic diarrhoea
Onset	Begins within a few hours to a day or two after eating contaminated food	Acute diarrhoea
	Begins during or soon after return from visit to tropical or subtropical country	Traveller's diarrhoea
Timing of diarrhoea	Throughout the day	Acute diarrhoea Traveller's diarrhoea
	Early morning or during the night	Inflammatory bowel disease

Chronic diarrhea

- Recurrent or persistent diarrhea:

Irritable bowel

Inability to digest or absorb food (celiac disease)
inflammation

Bowel tumor (prolonged change, more likely with ↑age)

- Irritable bowel syndrome (IBS)

One of the more common causes of diarrhea in adolescents and young adults. The patient usually describes small volumes of stool rather than true diarrhea

Management

Oral rehydration therapy

Standard treatment for acute diarrhea

Rehydration may still be initiated even if referral to the doctor is advised

Contains sodium as chloride and bicarbonate/Citrate, glucose and potassium

- They contain sodium and potassium to replace these essential ions and citrate and/or bicarbonate to correct acidosis.

Advices about how the powder should be reconstituted:

- Only water should be used to make the solution (never fruit or fizzy drinks → hyperosmolar solution)
- Boiled and cooled water should be used for < 1 year
- Boiling water should not be used, as it would cause the liberation of carbon dioxide.
- The solution can be kept for 24 h if stored in a refrigerator.
- Home-made salt and sugar solutions should not be recommended becoz the accuracy of electrolyte content cannot be guaranteed.

Quantity

The amount of solution offered to the patient is based on the number of watery stools that are passed.

Amount of rehydration solution to be offered to patients

Age	Quantity of solution (per watery stool)
Under 1	50 ml (quarter of a glass)
1–5	100 ml (half a glass)
6–12	200 ml (one glass)
Adult	400 ml (two glasses)

Loperamide

- Loperamide is an effective antidiarrheal treatment for use in older children (>12 years) and adults.
- Oral rehydration sachets must be recommended

Contraindications:

1. Abdominal pain in the absence of diarrhea
2. Bacterial enterocolitis, caused by invasive organisms including Salmonella, Shigella, and Campylobacter
3. Dysentery
4. Infants below 24 months of age
5. Pseudomembranous colitis
6. Ulcerative colitis

Diphenoxylate

- Diphenoxylate is a synthetic derivative of pethidine.
- It has little or no central action but acts selectively on gastrointestinal smooth muscle.
- It takes longer to act than loperamide.
- Diphenoxylate is combined with atropine as co-phenotrope. Atropine is included at a subtherapeutic dose to discourage abuse, on the premise that unpleasant antimuscarinic effects will be experienced if higher than recommended doses are taken.
- Co-phenotrope is not licensed for non-prescription use in children under 16 years.

Antibiotics

- **Antibiotics** play a **minor role** in the treatment of acute diarrhea because most episodes are self-limiting.
- Antibiotics should be used only
 - When systemic bacteremia is suspected
 - When immune defenses are compromised
 - When a persistent enteric infection is sensitive to antibiotics

Other Options

- Plantagel, adsorb bacterial toxins and water, but they do not decrease fluid and electrolyte losses. this also can adsorb nutrients, enzymes, and antibiotics
- Bismuth subsalicylate is claimed to possess adsorbent properties, and some studies have shown it to be effective in treating diarrhoea. Large doses are required and salicylate absorption may occur. It should be avoided by individuals sensitive to aspirin.
- Probiotics, live microbial foods containing species of lactobacillus, bifidobacterium, saccharomyces can improve the balance of intestinal flora and diminish the effect of enteric pathogens.

Practical points

1. Patients should be advised to drink plenty of non-milky fluids (during diarrhea the lactase is inactivated which makes the diarrhea worse)
2. It is better to eat no solid food for 24 h
 - NHS Clinical Knowledge Service (CKS) says that the patient can be advised to continue their usual diet but that fatty foods and foods with a high sugar content might be best avoided as they may not be well tolerated.
3. Breast- or bottle-feeding should be continued in infants
 - During this period, babies should be fed more frequently than normal and feeds should be supplemented with ORT.
 - Formula feeds should be diluted to quarter-strength, and built back up to normal over 3 days.
4. Continue feeding using age-appropriate diet while avoiding simple sugars, which can increase osmotic load and worsen diarrhea