

FOOD POISONING

KEY POINTS

All patients with diarrhoea must be nursed in source isolation

Send samples to the laboratory

Inform Infection Control Team

Consider whether it is part of an outbreak

Remember that *C. difficile* is common in hospital environment

Whereas all antibiotics can cause diarrhoea, some are more likely than others to precipitate pseudomembranous colitis, which is a rare but serious infection with a high mortality caused by *C. difficile* (see policy for Antibiotic Associated Diarrhoea)

See policies for Food Poisoning and Outbreak Management

Campylobacter spp.

- **Present in** uncooked poultry and meat, unpasteurised milk and faecally contaminated water. Like *Salmonella* is resident in the gut of animals.
- **Transferred by** careless handling of meat, especially raw poultry; self-contamination and cross-contamination from the hands. Drinking contaminated raw milk has been implicated in some outbreaks.
- **Symptoms** similar to salmonellosis. Abdominal cramps, followed by foul smelling, bile stained or bloody diarrhoea.
- **Prevention** scrupulous cleanliness before and after handling raw meat and poultry. Prevent cross contamination from raw to cooked foods.

Salmonella spp.

- **Present in** Raw meat, poultry, untreated milk, made-up foods such as sausage meat, mince, mayonnaise and egg mixes.
- **Transferred** from food to hands, utensils or work surfaces which in their turn can contaminate other surfaces or cooked foods such as ham, corned beef and other cold meats to be eaten without further cooking. Also direct contamination from raw to cooked food.
- **Symptoms** Nausea, vomiting, abdominal pain and diarrhoea, possibly accompanied by headache and fever - from 6-72 hours after eating (usually 12-36 hours). Speed of onset depends on dose. Elderly and AIDS patients susceptible to septicaemia.
- **Prevention** Hand washing after handling raw food. Thoroughly clean utensils and work surfaces before re-use. Separate storage and preparation areas for raw and cooked food.

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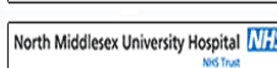
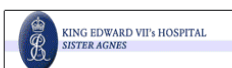
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Staphylococcus aureus

- **Present on** normal healthy skin or in nose or throat. Septic lesions in food handlers and certain virulent strains are risky.
- **Contamination is transferred** by infected hands directly on to cooked food. The organism, though usually destroyed by normal cooking, produces a heat resistant toxin. Once contamination occurs in certain made-up or prepared dishes, re-heating or even thorough cooking will not destroy it.
- **Symptoms** vomiting, occasional abdominal pain, diarrhoea, headache, sweating and exhaustion from 1-6 hours after eating.
- **Prevention** Frequent handwashing by food handlers. Those with infected wounds on hands and arms should not handle food until wounds have healed. Where possible, avoid handling cooked food.

Clostridium perfringens

- **Present in** soil, in human and animal excreta, in raw meat and poultry and in other food including dehydrated products.
- **Transferred** by spores - dormant in food, soil and dust and capable of surviving heat and dehydration - may be activated by cooking to germinate and multiply to large numbers necessary to cause illness. The illness is caused by an heat labile enterotoxin. Outbreaks are liable to occur in large-scale catering where meat and poultry dishes are pre-cooked, cooked slowly, incorrectly stored and then re-heated inadequately.
- **Symptoms** abdominal pain, headache, vomiting and diarrhoea 8-22 hours after eating contaminated food.
- **Special care** Correct cooling time before refrigeration is one of the critical factors. Uneven heating of bulk fluids especially stews can lead to outbreaks.

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Bacillus cereus

- **Present in** air and in soil where vegetables, cereals and rice grow.
- **Contamination of** warm cooked rice, kept in warm moist conditions, allows the spores to germinate, multiply and produce enterotoxins. Growth on rice encourages toxin production. Rapid reheating of rice (eg “fried rice”) is not sufficient to inactivate these toxins.
- **Symptoms** of two kinds (i) nausea, vomiting within 1-6 hours (like *S. aureus*), (ii) acute diarrhoea with occasional vomiting within 6-16 hours (like *C. perfringens*). Never both.
- **Prevention** Proper storage of cooked rice.

Acute diarrhoea caused by viruses

- **Acquired by** eating undercooked shellfish or by the faecal-oral route. Generally very infectious and easily transmitted from person-to-person. Outbreaks often occur in nurseries and in hospitals (especially care of the elderly wards) where hygiene is deficient.
- **Symptoms:** Incubation period a day or two depending on the virus. Preceded by a cold-like symptoms (hence the term “gastric ‘flu), the first GI symptom is usually vomiting, often unexpected and projectile- hence the infectivity. Proceeds to major watery diarrhoea usually without blood and pus.
- **Prevention:** No undercooked or raw shellfish in hospital. Isolate all patients with diarrhoea. Obsessional hand hygiene.

Specific viruses:

- **Rotavirus:** resistant to disinfectants and survive well on fomites. Replicates and destroys intestinal epithelium. Common in infants and the elderly.
- **Norovirus: Norwalk and other Small Round Structured Viruses (SRSV).** Acute gastroenteritis, extremely infectious.
- **Caliciviruses** probably obtained from animals. Some explosive outbreaks. High secondary attack rate.

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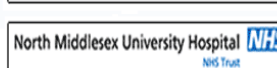
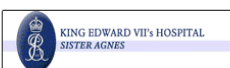
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Diagnosis:

- Electron Microscopy
- ELISA capture antibodies(monoclonal) detect VP6 core protein of type A rotavirus.
- Latex agglutination. (Some false positives)
- Polyacrylamide gel electrophoresis.

Escherichia coli O157 (an example of enterohaemorrhagic *E. coli*)

- **Present in** undercooked meat, especially beef and unpasteurised milk products.
- Transferred by **cross contamination from hands, with occasional outbreaks. Widespread outbreaks are associated with undercooked hamburgers and unpasteurised milk. The infective dose is very low.**
- **Symptoms:** cramping abdominal pain and diarrhoea, often bloody. Vomiting is present in half the patients affected but fever is not usually a feature. Rarely infection is associated with Haemolytic Uraemic syndrome because of the shiga toxin (from *Shigella dysenteriae*) which is carried by the organism. The patient has haemolytic anaemia, acute renal failure with a low platelet count.
- **Prevention:** Thorough cooking of beef products and pasteurisation of all dairy products. handwashing before preparing food and eating. Care with occupational and recreational exposure to animals.

PATIENT MANAGEMENT

- Source isolate
- Inform Infection Control Team about admissions and nosocomial diarrhoea
- If an outbreak is suspected, follow guidance in policy for Outbreak Management
- Make a list of patients with date of onset of diarrhoea/vomiting
- Send any diarrhoeal stool for analysis
- Note dates of admission
- Note whether on laxatives* or on antibiotics
- Phone Infection Control Team

*Note: most apparent outbreaks are “pseudo-outbreaks”, coincident episodes of diarrhoea caused by a number of different factors, including overzealous use of laxatives in the elderly.

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TREATMENT OF ACUTE GASTROENTERITIS (ALL CAUSES)

Replace fluids and electrolytes. Carbohydrate:sodium ratio 1.2:1. Use oral rehydration unless severe. Intravenous rehydration often used unnecessarily. Do not use antisecretory drugs (bismuth), antimotility drugs (loperamide), absorbants (kaolin), antiemetics. They are all ineffective in acute infection and do not prevent fluid loss. Antibiotics are ineffective for most gastroenteritis which is self-limiting, but essential for elderly patients with salmonella septicaemia. Antibiotics probably prolong the carrier state of *Salmonella* and *Shigella*. Do not discontinue feeding in children.

THE TEN MOST COMMON CAUSES IMPLICATED IN OUTBREAKS OF FOOD POISONING

1. Food prepared too far in advance
2. Food stored at room temperature, i.e. not under refrigeration
3. Cooling food too slowly prior to refrigeration
4. Not reheating food to high enough temperature to destroy food poisoning bacteria and heat labile toxins
5. The use of cooked food contaminated with food poisoning bacteria
6. Undercooking meat and meat products (including poultry)
7. Not thawing frozen meat and poultry for sufficient time
8. Cross contamination from raw to cooked foods
9. Storing hot food below 63°C (145°F)
10. Infected food handlers

If you suspect an outbreak on the ward, read policy for Outbreak Management

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