7. Cryptosporidiosis

(Notifiable)

Description: *Cryptosporidium* is a protozoal parasite that generally produces an unpleasant but (in healthy individuals) self-limiting intestinal infection. Its public health importance lies in its ability to generate large waterborne outbreaks (following contamination of drinking water supplies) and the severe, protracted disease in immunocompromised individuals.

Annual Numbers: Between 400 and 600 cases per year. Ireland has the highest cryptosporidiosis notification rate in the EU.

Seasonal Distribution: There is a seasonal peak in spring time corresponding with the lambing/calving season.

Causative Agent: *Cryptosporidium hominis* (formerly known as *C. parvum* genotype 1) and *C. parvum* (formerly *C. parvum* genotype 2). Parasites of both genogroups produce disease by attachment to surface epithelial cells that line the gastrointestinal tract. Cryptosporidia are resilient; they are highly resistant to standard levels of chlorination in drinking water and can only be counteracted by removal using fine filters (sand or artificial filters less than 1μm) or boiling water to kill the oocysts (water needs only to be brought to the boil to kill *Cryptosporidia*; it does not have to be boiled for any length of time). Parasitic oocysts can survive in the environment for many months in moist conditions. Previous infection induces some degree of protective immunity.

Reservoir: The gastrointestinal tract of humans (*C. hominis*) and animals (*C. parvum*) including cattle, sheep, pigs, cats, dogs, poultry and fish. Asymptomatic carriage ranges from less than 1% to more than 3%.

Transmission:
Primary: Transmission is through ingestion of water or food contaminated with the faeces of an infected human or animal. It is likely that more than 90% of cases will be transmitted through water. High risk foods include fresh produce irrigated with inadequately treated water. Direct contact with animals and swimming pools are increasingly recognised as important transmission routes.
Secondary: Person to person transmission can be a significant feature of spread particularly in the case of shedding food handlers.

Outbreak Potential: *Cryptosporidium* has moderate to high outbreak potential if transmitted through food or by person to person and a very high to extremely high outbreak potential if transmitted through water.

Cryptosporidium is capable of producing extensive outbreaks – most cases are transmitted via water

Incubation period: Medium-Long: typically 7-10 days but a range of 1-28 days has been reported.

Period of communicability: Cases remain infectious for as long as viable oocysts are excreted in the stool - certainly while diarrhoea is present. Patients generally remain infectious for between two and four weeks. Shedding may continue for up to two months after symptoms subside. Symptoms last between one and four weeks. In the severely immunosuppressed, *Cryptosporidium* produces a prolonged, severe and often highly debilitating illness.

Epidemiology: *Cryptosporidium* is found in the intestine of infected humans or animals. Millions of oocysts are released in a bowel movement from an infected human or animal. It is found in soil, food, water and surfaces that have been contaminated with human or animal faeces. It is a common cause of waterborne outbreaks of gastroenteritis. The infectious dose is comparatively low, possibly as few as 100-300 parasites.

Exposure-prone groups: those who take their water from untreated or inadequately-treated supplies, those who work with animals (especially during birthing), residents in institutions, children in day centres, childcare staff, returning travellers, hikers and backpackers, lake swimmers and food handlers.

Clinical Features: *Cryptosporidium* produces watery or mucoid diarrhoea that lasts between two days and four weeks in immunocompetent patients. There is occasionally mild fever. Symptoms may wax and wane before recovery. There may be prodromal anorexia and vomiting can be prominent (particularly in children). Asymptomatic infection is common. In immunocompromised individuals, it may produce debilitating disease, most especially in those patients with CD4 T-lymphocyte counts below 200 cells/mm^3; such individuals may have extreme difficulty clearing the parasite from the gut.

Clinical Management of Cases:
Enteric precautions. In healthy individuals, cryptosporidiosis is self-limiting and requires no treatment other than routine rehydration measures. Cryptosporidiosis in immunocompromised individuals can be quite challenging and such patients should be referred for specialist advice.
The case should be notified to the local Department of Public Health. It is important to determine if the case is aware of similar cases suggesting the possibility of an outbreak. Determine if case is in a risk category.

Public Health Management of Cases: Obtain history of raw water consumption, swimming, nursery attendance, travel and animal contact for 14 days prior to onset of symptoms. Determine if linked cases.

Food Hygiene Implications: Food hygiene re-education is necessary for food handlers.

Public Health Management of Contacts
Clinical surveillance only. Screening of household members and contacts is only necessary if an outbreak is suspected. Food hygiene re-education is necessary food handlers.

Exclusion: Until 48hr after first normal stool. Cases should avoid using swimming pools for two weeks after the first normal stool.

Microbiological Clearance: Not required.

Additional Information: Since infection in severely immunocompromised patients can lead to severe, prolonged potentially fatal disease with chronic shedding, all such individuals should discuss with their hospital consultant the need to ensure that their water is of potable quality.

Notifiable: to the local Medical Officer of Health.