

## **CLOSTRIDIUM DIFFICILE BACKGROUND INFORMATION**

### **Introduction**

The Department of Health published The Code of Practice for the Prevention and Control of Healthcare Associated infections in October 2006 calling for Primary Care Trusts to have a specific policy on the prevention and control of *Clostridium difficile* (*C. difficile*) infections. This Health Act sets out criteria by which NHS managers should ensure that patients are cared for in a clean environment where the risk of healthcare-associated infections is minimal.

However, in spite of the new policies in place across PCTs, there are still almost 13,000 cases of *C. difficile* reported from 168 Trusts over a three-month period. *C. difficile* infection remains the most important cause of hospital-acquired diarrhoea and, furthermore, one in every 250 death certificates now cites the *C. difficile* superbug as a contributory or main factor.

### **What are the cost implications associated with *Clostridium difficile*?**

According to the National Clostridium Difficile Standards Group, established by the Health Protection Agency on behalf of the Department of Health in 2003, the total number of cases of *C. difficile* in patients over 65 years old in England between January and December 2004, was 44,488 for 166 Trusts.

Each of these patients would require, on average, an extra 21 days in hospital, taking up hospital beds and requiring nursing care. The cost of using these resources and treating *C. difficile* has been estimated at over £4,000 per patient. With more than 40,000 cases per year, just a 10% reduction in the number of *C. difficile* cases could save 84,000 bed days, making a financial saving of £16 million per year. Ensuring staff demonstrate compliance with national guidance and good practice in infection prevention is vital to reduce the number of *C. difficile* infection cases, making huge financial savings and, more importantly, saving lives.

### **What is *Clostridium difficile*?**

*C. difficile* is a spore-forming bacterium that is present as one of the 'normal' bacteria in the gut of up to 3% of healthy adults. Nearly two-thirds of infants also have *C. difficile* in the gut, where it rarely causes problems.

*C. difficile* is usually kept in check by other bacteria living in the gut that are essential for maintaining good health. However, it can cause illness when certain antibiotics disturb the balance of 'normal' bacteria in the gut, allowing *C. difficile* to multiply. When this happens the bacterium produces poisons (toxins) which can lead to diarrhoea and severe inflammation of the bowel. The optimum temperature for the production of these toxins by the bacteria is human body temperature.

### **What are the symptoms of *Clostridium difficile* infection?**

Symptoms range from mild to severe diarrhoea, stomach cramps and tenderness, fever, loss of appetite and nausea to, more unusually, severe inflammation of the bowel (known as pseudomembranous colitis).

In severe cases, patients can suffer ulceration and bleeding from the colon (colitis). At worst the intestine tears, so that the spaces in the surrounding abdomen become infected and this can be fatal.

It is difficult to diagnose *C. difficile* infection on the basis of its symptoms alone, therefore the infection is normally diagnosed by carrying out laboratory testing to show the presence of the *C. difficile* toxins in the patient's faecal sample.

### **Who is most susceptible to catching *Clostridium difficile*?**

Over 80% of *C. difficile* infections are reported in people aged over 65 years, making the elderly most at risk. Patients who have been treated with broad spectrum antibiotics within 4 weeks previously are also at considerable risk of developing *C. difficile* infection. Broad spectrum antibiotics kill off a wide range of 'normal' as well as harmful bacteria, thereby altering the gut flora, allowing *C. difficile* to infect and produce a toxin that causes diarrhoea.

*C. difficile* infection can also occur in anyone who has undergone gastrointestinal surgery, had a long stay in a hospital or nursing home or whose immune system is not functioning properly.

### **How is *Clostridium difficile* spread?**

*C. difficile* produces spores that can live in the environment for a long time. Any surface, piece of equipment, furniture or furnishing can harbour the spores and people can become infected by touching contaminated surfaces.

The bacteria are shed in faeces. Touching even the smallest amount of infected faeces, and then touching your mouth you can become infected with *C. difficile*. The risk of cross-infection increases when patients have diarrhoea and bathrooms and toilets are shared. *C. difficile* infection is also spread on the hands of healthcare staff and other people who come into contact with infected patients or with environmental surfaces (e.g. floors, bedpans, toilets) contaminated with the bacteria or its spores. *C. difficile* can be spread from person to person by poor hygiene, by failing to wash your hands properly after going to the toilet, or after handling contaminated food.

### **What can be done to reduce the risk of infection of *Clostridium difficile*?**

*C. difficile* is a type of bacterium that produce resistant spores that are able to persist in the environment longer than other bacteria. Although they will not be killed by alcohol hand gels, they can be removed with soap and water. Staff, patients and visitors need to wash hands with soap and water in addition to using alcohol hand gels. Disinfectants containing bleach need to be used on surfaces and floors to ensure that the spread of infection is controlled.

Hands should be washed thoroughly with soap and warm water before preparing and eating food, after handling raw food, after going to the toilet or changing a baby's nappy, after visiting hospitals and care homes. Care should also be taken to prescribe antibiotics only when necessary.

If someone has *C. difficile*, wash all dirty clothes, bedding and towels in the washing machine on the hottest cycle possible. Clean toilet seats, toilet bowls, flush handles, taps and wash hand basins after use with detergent and hot water.

In an outbreak situation, the Infection Control Team may introduce special measures for staff, patients and visitors to follow.

### **What is the treatment for *Clostridium difficile*?**

*C. difficile* is usually treated with specific antibiotics. However, if patients develop the infection while taking antibiotics, but only have mild diarrhoea, then stopping the antibiotics, if possible, is often enough to relieve the symptoms. Patients should drink plenty of fluids as diarrhoea or vomiting can lead to dehydration and it may be necessary to recommend a rehydration solution to replace essential sugars and minerals.

Once the diarrhoea stops it indicates the infection has gone. However, the normal procedures of routine hand washing, and cleaning of the environment should be continued. There is a risk of relapse in 20-30% of patients and other treatments may be tried, including probiotic (good bacteria) foods and drinks, with the aim of re-establishing the balance of flora in the gut.

### **The Health Protection Agency (HPA) and *Clostridium difficile***

Hospitals have to report all cases of *C. difficile* to the Agency. They monitor outbreaks and look for any patterns or trends and for any new strains of the bacteria as well as providing advice on how *C. difficile* can be treated.

### **References:**

[http://www.dh.gov.uk/en/Policyandguidance/Healthandsocialcaretopics/Healthcareacquiredinfection/Healthcareacquiredgeneralinformation/DH\\_4115800](http://www.dh.gov.uk/en/Policyandguidance/Healthandsocialcaretopics/Healthcareacquiredinfection/Healthcareacquiredgeneralinformation/DH_4115800)

[http://www.hpa.org.uk/infections/topics\\_az/clostridium\\_difficile/](http://www.hpa.org.uk/infections/topics_az/clostridium_difficile/)

Karlsson S et al. Expression of *Clostridium difficile* toxins A and B and their sigma factor TcdD is controlled by temperature. *Infect Immun.* 2003 Apr;71(4):1784-93.