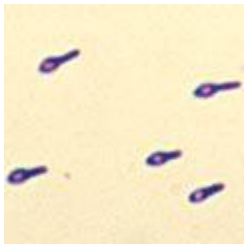
Health Protection Agency

http://www.hpa.org.uk/

Botulism



Botulism is caused by botulinum toxin, a poison produced by the bacterium *Clostridium botulinum*.

The organism is common in the soil and can survive in this environment as a resistant spore.

C. botulinum (Photo: CDC)

There are three main types of botulism - foodborne botulism, intestinal botulism (which is due to proliferation of the organism in the gut) and wound botulism.

Symptoms often begin with blurred vision and difficulty in swallowing and speaking, but diarrhoea and vomiting can also occur. The disease can progress to paralysis. Most cases will recover, but the recovery period can be many months. The disease can be fatal in 5-10% of cases; death is due to respiratory failure.

Anthrax

Anthrax is a bacterial infection caused by *Bacillus anthracis*, spores of which can survive in the environment for years or decades. It is primarily a disease of herbivorous mammals, though other animals and some birds, particularly carrion birds, can also contract it.

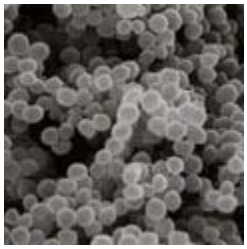
Tetanus

Tetanus is caused by a neurotoxin produced by *Clostridium tetani*, an anaerobic spore forming bacillus. Tetanus spores are widespread in the environment, including in soil, and can survive hostile conditions for long periods of time. Hence tetanus disease can be eliminated by vaccination but never eradicated. Transmission occurs when spores are introduced into the body, often through a puncture wound but also through trivial, unnoticed wounds, through injecting drug use, and occasionally through abdominal surgery. The infection is not passed from person to person and there is no herd immunity. The incubation period of the disease is usually between three and 21 days, although it may range from one day to several months, depending on the character, extent, and localisation of the wound.

The first symptoms of tetanus are stiff muscles near the wound (or injection site) followed by stiffening of other muscles and of the jaw until the patient can't open their mouth ('lockjaw'). This can be followed by frequent and painful spasms. The illness can progress for about 2 weeks. The muscle spasms can affect the patient's breathing and heart, which can be fatal.

The disease is completely preventable through adequate immunisation and wound management. Tetanus immunisation was introduced in the 1950s and became part of the national routine childhood programme in 1961. Five doses of vaccine are now considered to give adequate immunity and routine boosters every ten years are no longer necessary (Department of Health. Green Book chapter: Tetanus).

Staphylococcus aureus



Staphylococcus aureus is a bacterium that commonly colonises human skin and mucosa (e.g. inside the nose) without causing any problems. It can also cause disease, particularly if there is

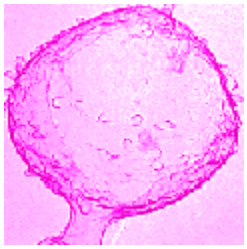
an opportunity for the bacteria to enter the body, for example through broken skin or a medical procedure.

Image courtesy of K Hiramatsu

If the bacteria enter the body, illnesses which range from mild to life-threatening may then develop. These include skin and wound infections, infected eczema, abscesses or joint infections, infections of the heart valves (endocarditis), pneumonia and bacteraemia (blood stream infection). *Staphylococcus aureus* also produces toxins, which if the bacteria contaminate incorrectly prepared food can cause **food poisoning** and have also been linked with toxic shock syndrome. Some strains also produce another toxin called **PVL**, these tend to cause more severe disease.

Most strains of *S. aureus* are sensitive to the more commonly used antibiotics, and infections can be effectively treated. Some *S. aureus* bacteria are more resistant. Those resistant to the antibiotic meticillin are termed meticillin-resistant *Staphylococcus aureus* (MRSA) and often require different types of antibiotic to treat them. Those that are sensitive to meticillin are termed meticillin-sensitive *Staphylococcus aureus* (MSSA). MRSA and MSSA only differ in their degree of antibiotic resistance: other than that there is no real difference between them.

Group A Streptococcal Infections

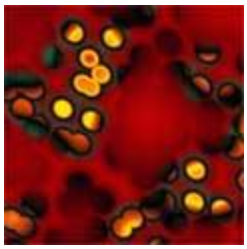


Group A streptococci (*Streptococcus pyogenes*) cause a wide-range of disease in humans, from mild sore throats to life-threatening invasive disease such as necrotising fasciitis.

Image courtesy of V.A. Fischetti

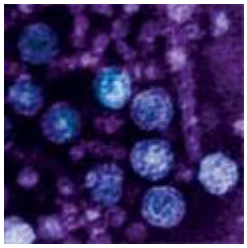
This bacterium is commonly found on the skin or throat where it can live without causing infection. Under particular circumstances however, this organism can cause disease.

Hepatitis C



Hepatitis means inflammation of the liver. The most common causes of hepatitis are viral infections. Hepatitis C is one such virus that can cause long-lasting infection and is transmitted when blood from an infected person gets into the bloodstream of another.

Hepatitis B



The hepatitis B virus (HBV) causes inflammation of the liver. The virus is transmitted by contact with infected blood.

General Information on Hepatitis B

What is hepatitis B?

Hepatitis B is a bloodborne viral infection that can be prevented through vaccination. The hepatitis B virus (HBV) causes hepatitis (inflammation of the liver) and can also cause long term liver damage.

What are the symptoms of hepatitis B?

The average incubation period is 40-160 days. Many people have no symptoms while others experience a flu-like illness including a sore throat, tiredness, joint pains, and a loss of appetite. Other symptoms may include nausea and vomiting. Acute infection can be severe causing abdominal discomfort and jaundice. Mortality during the acute phase of infection is less than 1%.

How common is hepatitis B?

The World Health Organization (WHO) estimates that in the UK the prevalence of chronic hepatitis B infection is 0.3%. Hepatitis B is more common in other parts of the world such as

south east Asia, Africa, the middle and Far East and southern and eastern Europe. WHO estimates that there are 350 million chronically infected people world-wide.

How is hepatitis B virus transmitted?

The virus may be transmitted by contact with infected blood or body fluids such as through household or sexual contact with an infected person. The virus can be spread by the following routes:-

- sharing or use of contaminated equipment during injecting drug use
- vertical transmission (mother to baby) from an infectious mother to her unborn child
- sexual transmission
- receipt of infectious blood (via transfusion) or infectious blood products (for example clotting factors)
- needlestick or other sharps injuries (in particular those sustained by hospital personnel)
- tattooing and body piercing

What is chronic hepatitis B infection?

The failure to clear hepatitis B infection after six months leads to the chronic carrier state. Many people who become chronic carriers have no symptoms and are unaware that they are infected. These individuals will remain infectious and will be at risk of developing cirrhosis and primary liver cancer.

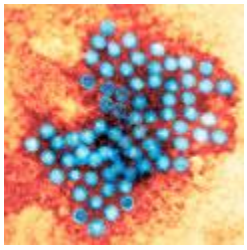
Is there a treatment for chronic hepatitis B infection?

Alpha interferon is an antiviral drug that is used to treat patients with chronic hepatitis B infection. Other drugs with antiviral properties, such as lamivudine, are also used. Not all patients are suitable for treatment.

How can hepatitis B be prevented?

There is a vaccine available to prevent hepatitis B infection. The vaccine should be given to all individuals who are at risk from hepatitis B infection.

Hepatitis A



Hepatitis A virus infection causes a range of illness from mild through non specific nausea and vomiting through to hepatitis (liver inflammation, jaundice, or icterus) and rarely liver failure. Symptoms and severity of the illness are generally worse the older the person is when they become infected.

Hepatitis A virus was a common childhood infection in the early 20th Century but now in the 21st century it is an unusual infection in the UK. It is normally spread by the faecal-oral route but can also be spread occasionally through blood. Infection is prevented by good hygiene, especially hand washing, safe drinking water and food. Vaccination, passive or active, can be used to prevent groups at high risk including people who have been in contact with someone else who has the infection, travellers to countries where the infection is common, and other groups such as injecting drug users.

For further details, see the Guidelines for the control of hepatitis A virus infection. The Health Protection Agency Immunisation Division takes a lead for England in national surveillance of hepatitis A virus through statutory notifications (infectious jaundice since 1969, hepatitis A since 1987) and laboratory reports. The Immunisation Division provides advice and supplies human normal immunoglobulin for contacts of cases. This can be obtained by health professionals through the CDSC Duty Doctor service.

HIV data: Injecting Drug Users 2009

Injecting drug users (IDUs) are vulnerable to HIV through the sharing of injecting equipment, as well as through sexual transmission. Transmission of HIV through injecting drug use was recognised early on in the HIV epidemic, at the beginning of the 1980s.

Other than an outbreak in Edinburgh in the early 1980s, HIV infection among IDUs has remained relatively uncommon in the UK, with around one in 75 IDUs currently infected with HIV. Higher levels of HIV infection among IDUs have been reported in London, and surveillance data suggest that there have been raised levels of HIV transmission among IDUs in recent years.

Tuberculosis (TB)

Tuberculosis (TB) is an infectious disease caused by bacteria belonging to the *Mycobacterium tuberculosis* complex.

(Image: © Service photo / Institut Pasteur)

About TB
Over nine million new cases of TB, and nearly two million deaths from TB, are estimated to occur around the world every year. TB is the leading cause of death among curable infectious diseases. The World Health Organization declared TB a global emergency in 1993.

TB usually causes disease in the lungs (pulmonary), but can also affect other parts of the body (extra-pulmonary). Only the pulmonary form of TB disease is infectious. Transmission occurs through coughing of infectious droplets, and usually requires prolonged close contact with an infectious case. TB is curable with a combination of specific antibiotics, but treatment must be continued for at least six months.

Around 9000 cases of TB are currently reported each year in the United Kingdom. Most cases occur in major cities, particularly in London.

The Health Protection Agency aims to contribute to the elimination of TB in England through supporting the National Health Service and the Department of Health in the key areas identified for controlling TB in the national Action Plan, Stopping Tuberculosis in England, published by the Chief Medical Officer in October 2004.

Through its TB Programme, the HPA co-ordinates its TB control activities, which are carried out by different parts of the organisation: Health Protection Services - Colindale, Local and Regional Services, the Regional Microbiology Network and Microbiology Services – Porton. The activities include local and national surveillance, laboratory diagnostic and reference services, disease control in the population, international partnership and cutting edge research.