

# **Leeds Teaching Hospitals NHS Trust**

## **Occupational Health Services**

### **Infectious Diseases and Vaccination for Students on Healthcare courses**

It is important to protect students from infectious diseases encountered in the healthcare setting, it is also important to prevent the spread of infectious diseases from healthcare students to patients and colleagues. In the healthcare setting, various measures are used to control healthcare worker/student and patient exposure to infectious diseases in the patient environment. These include universal precautions, controlling the spread of infection from index cases, testing healthcare students for infectious diseases (such as hepatitis B, hepatitis C, HIV and TB), routine healthcare student immunisations and specific healthcare student immunisations.

This section gives a brief overview of the occupational health service role in testing healthcare students for infectious diseases and specific healthcare student immunisations. Information is in the Department of Health guidance against infectious diseases "The Green Book" and the Health Protection Agency Infection Topics.

Health clearance for new healthcare workers for tuberculosis, hepatitis B, hepatitis C and HIV was introduced in 2007.

#### **Vaccination**

All healthcare students need to be up to date with their routine immunisations such as tetanus, diphtheria, polio and mumps/measles/rubella (MMR). Healthcare students may also need other immunisations as outlined in the Green Book chapter entitled Immunisation of healthcare and laboratory staff.

#### **Hepatitis B Virus infection and vaccination**

Hepatitis B virus infection is a bloodborne 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. 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 and jaundice. The virus may be transmitted by contact with infected blood or body fluids. The virus can be spread by sharing or use of contaminated equipment during injecting drug use, from an infectious mother to her unborn child, sexual transmission, receipt of infectious blood (via transfusion) or infectious blood products, needlestick or other sharps injuries such as in healthcare workers and tattooing and body piercing.

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 to others and will be at risk of developing cirrhosis and primary liver cancer.

In the healthcare environment the hepatitis B virus can be transmitted between health care workers and patients by accidental exposure to infected blood or body fluids. Some healthcare workers/students need to be tested for infection to hepatitis B before commencing clinical duties.

With regard to hepatitis B infected healthcare workers/students, depending on the results of blood tests:

- some cannot perform certain clinical procedures (exposure prone procedures, defined at the end of this section) and cannot carry out clinical duties in renal dialysis and renal transplantation units.

- some will be able to do these things but will need strict regular monitoring with or without treatment.

Hepatitis B vaccination is recommended for healthcare workers/students who may have direct contact with patients' blood or body fluids. This includes healthcare workers/students who are at risk of injury from blood contaminated sharp instruments, or of being injured or bitten by patients. Pre-exposure immunisation schedule for healthcare worker is commonly 3 vaccines given at 0, 1, 2 months followed by a blood test to check immunity 1-4 months later with a booster hepatitis B vaccination five years later. Advice on protecting patients and healthcare workers/students, testing for infection with hepatitis B and vaccination against hepatitis B can be provided by occupational health service. Hepatitis B blood tests for individuals can be carried out by occupational health service on request.

## **Hepatitis C Virus infection**

Hepatitis C virus infection infects the liver and can cause long-lasting infection and can lead to liver disease. The prevalence of chronic hepatitis C infection in England is estimated be around 0.4% (many undiagnosed). Hepatitis C virus transmission is most commonly due to needle sharing in drug abuse. Sexual transmission/mother to baby transmission can occur. Acute infection is often asymptomatic with 60-80% developing chronic infection. Up to 20% of chronically infected develop cirrhosis and rarely hepatic malignancy. Those with chronic infection have the potential to infect others.

No immunisation is available, but early detection and treatment improves prognosis.

Healthcare workers/students who will carry out exposure prone procedures need to be tested for hepatitis C antibody. Those who are positive need to be tested for hepatitis C RNA to detect the presence of current infection. If the

healthcare worker/student is infected with hepatitis C the healthcare worker/student cannot carry out certain exposure prone procedures unless they fulfil the criteria for clearance of the virus.

Occupational health service can provide hepatitis C workplace advice and testing as appropriate. Hepatitis C blood tests for individuals can be carried out by occupational health service on request.

## **HIV (Human Immunodeficiency Virus) infection**

When a person has HIV, infectious virus can be found in their blood, semen (men), vaginal fluids (women) and breast milk (women). Anyone can become infected with the virus if he or she is exposed to infection through sex or blood products.

There are certain groups at higher risk of infection than others in the UK. These include homosexual men, injecting drug users, men and women who have lived as adults in countries where heterosexual transmission of HIV is common (notably South, East and Central Africa) and children, from their infected mothers during pregnancy or anyone who has had unprotected sexual intercourse with any of these groups.

People with HIV usually have no symptoms for a prolonged period of time, while the virus acts slowly to weaken the body's immune system. When a person's immune system has been broken down, he or she is susceptible to other illnesses, especially infections (e.g. tuberculosis and pneumonia) and cancers, many of which are not normally a threat to a healthy person. At that severe stage of infection the person is often diagnosed as having AIDS (Acquired Immunodeficiency Syndrome).

No immunisation is available against HIV, but early detection and treatment improves prognosis.

All healthcare workers/students new to the NHS will be offered HIV testing and for those going into a role performing exposure prone procedures, HIV testing is mandatory.

Healthcare workers/students who are infected with HIV have previously been unable to perform exposure prone procedures. As of January 2014 new guidance has been published by Public Health England:

[http://www.hpa.org.uk/webc/HPAwebFile/HPAweb\\_C/1317140704390](http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317140704390)

As a result some healthcare workers/students infected with HIV may (with treatment or without) be able to undertake these procedures but will need strict regular monitoring under the supervision of the Occupational Health Service. All HIV infected healthcare workers/students performing exposure prone procedures will need to be registered with the confidential national register, the UKAP-OHR (UK Advisory Panel for Healthcare Workers Infected

with Blood-borne Viruses). For further information please discuss with an Occupational Health Physician.

Health care workers/students with HIV must ensure that they remain under regular medical and occupational health supervision whilst involved in the direct care of patients. HIV blood tests for individuals can be carried out by occupational health service on request.

### **Influenza virus infection and vaccination**

Influenza or 'flu' is a respiratory illness associated with infection by influenza virus. Symptoms frequently include headache, fever, cough, sore throat, aching muscles and joints. There is a wide spectrum of severity of illness ranging from minor symptoms through to pneumonia and death. Influenza occurs most often in the winter months, and normally peaks between December and March in the Northern hemisphere.

Influenza immunisation helps to prevent influenza in healthcare workers/students and may also reduce the transmission of influenza to vulnerable patients. Influenza vaccination is therefore recommended to healthcare workers/students directly involved in patient care, who are offered influenza immunisation on an annual basis. Influenza immunisation can be provided by occupational health service.

### **Mumps infection**

Mumps is an acute viral illness usually characterised by bilateral parotid swelling, although it may present with unilateral swelling. Parotitis may be preceded by several days of non-specific symptoms such as fever, headache, malaise, myalgias and anorexia. Asymptomatic mumps infection is common, particularly in children. Mumps is spread by airborne or droplet transmission. The incubation period is around 17 days, with a range of 14 to 25 days. Individuals with mumps are infectious from several days before the parotid swelling to several days after it appears.

Mumps virus frequently affects the nervous system. Headache, photophobia, neck stiffness, neurological complications including meningitis and encephalitis, may occur. Other common complications include pancreatitis, oophoritis and orchitis. Sensorineural deafness (bilateral or unilateral) is a well-recognised complication of mumps. For vaccination see MMR.

### **Measles infection**

Measles is an acute viral illness. The prodromal stage is characterised by the onset of fever, malaise, coryza, conjunctivitis and cough. The rash is erythematous and maculopapular, starting at the head and spreading to the trunk and limbs over three to four days. Measles is spread by airborne or droplet transmission. Individuals are infectious from the beginning of the prodromal period (when the first symptom appears) to four days after the appearance of the rash. It is one of the most highly communicable infectious diseases.

The incubation period is about ten days (ranging between seven and 18 days) with a further two to four days before the rash appears. The most common complications of measles infection are otitis media, pneumonia, diarrhoea and convulsions. There are other more rare complications. Complications are more common and more severe in poorly nourished and/or chronically ill children, including those who have impaired immunity. For vaccination see MMR.

### **Rubella infection**

Rubella is a mild disease with potentially very serious complications. There may be a mild prodromal illness involving a low-grade fever, malaise, coryza, mild conjunctivitis and enlarged lymph glands. The rash is usually transitory, erythematous and mostly seen behind the ears and on the face and neck. Clinical diagnosis is unreliable as the rash may be fleeting and is not specific to rubella. Rubella is spread by droplet transmission. The incubation period is 14 to 21 days. Individuals with rubella are infectious from one week before symptoms appear to four days after the onset of the rash. Complications include thrombocytopaenia and post-infectious encephalitis with in adults, arthritis and arthralgia occasionally seen.

Maternal rubella infection in pregnancy may result in foetal loss or in congenital rubella syndrome (CRS). Infection in the first eight to ten weeks of pregnancy results in damage in up to 90% of surviving infants with multiple defects common. The risk of damage declines to about 10 to 20% with infection occurring between 11 and 16 weeks gestation. Foetal damage is rare with infection after 16 weeks of pregnancy, with deafness being reported following infections up to 20 weeks of pregnancy. For vaccination see MMR.

### **Mumps, Measles and Rubella (MMR) vaccination**

The MMR vaccine is especially important in the context of the ability of healthcare workers/students to transmit measles or rubella infections to vulnerable groups. While healthcare workers/students may need MMR vaccination for their own benefit, they should also be immune to measles and rubella in order to assist in protecting patients. Satisfactory evidence of protection is documentation of having received two doses of MMR or having had positive antibody tests for measles and rubella.

As vaccine induced measles antibody develops more rapidly than that following natural infection, MMR vaccine can be used to protect susceptible contacts from suspected measles. To be effective against this exposure, vaccine must be administered very promptly, ideally within three days. Even where it is too late to provide effective post-exposure prophylaxis with MMR, the vaccine can provide protection against future exposure to all three infections.

If the healthcare worker/student is already incubating measles, mumps or rubella, MMR vaccination will not exacerbate the symptoms. In these circumstances a measles-like illness occurring shortly after vaccination is likely to be due to natural infection. If there is doubt about a healthcare

workers/students vaccination status, MMR should still be given as there are no ill effects from vaccinating those who are already immune.

Occupational health service can provide advice regarding healthcare workers/students and MMR.

### **Tuberculosis (TB) infection and BCG (Bacillus Calmette-Guérin) vaccination**

Human TB is caused by infection with bacteria of the *Mycobacterium tuberculosis* complex and may affect almost any part of the body. The most common form of TB in the UK is pulmonary TB, which accounts for almost 60% of all cases in the UK. Non-respiratory forms of TB are more common in young children in communities with connections to areas of the world with high prevalence, and in those with impaired immunity.

BCG vaccine is recommended for healthcare workers/students who may have close contact with TB infectious patients. BCG vaccination is particularly important for healthcare workers/students in maternity and paediatric departments and departments in which the patients are likely to have impaired immunity, e.g. transplant, oncology and HIV units. Healthcare workers/students need to see their GP if they have any of the following symptoms suggestive of TB, fever and night sweats, persistent cough for more than 3 weeks, losing weight, blood in the sputum (phlegm or spit) at any time. If TB is suspected or confirmed healthcare workers/students need to contact Occupational Health Service immediately.

Occupational health service can provide specialist advice regarding TB and healthcare workers/students, TB incidents, testing for exposure to TB, testing for immunity to TB and BCG as appropriate.

### **Varicella zoster virus infection (chicken pox) and vaccination**

Varicella (chickenpox) is an acute, highly infectious disease caused by the varicella zoster virus. Varicella is transmitted directly by personal contact or droplet spread. The incubation period is between one and three weeks. The secondary infection rate from household contact with a case of chickenpox can be as high as 90%. The disease can be more serious in adults, particularly pregnant women and those who smoke, as they are at greater risk of pneumonia. Pregnant women appear to be at greatest risk late in the second or early in the third trimester. The disease is also serious for neonates and individuals with impaired immunity with the risk of disseminated or haemorrhagic varicella greatly increased.

The illness usually starts with one to two days of fever and malaise although this may be absent. Vesicles begin to appear on the face and scalp, spreading to the trunk and abdomen and eventually to the limbs. After three or four days, the vesicles dry with a granular scab and are usually followed by further crops. Virus is plentiful in the nasopharynx in the first few days and in the vesicles before they dry up. The infectious period is from one to two days

before the rash appears until the vesicles are dry. This may be prolonged in those patients who are immune impaired.

Herpes zoster (shingles) is caused by the reactivation of the individual's varicella virus. Virus from lesions can be transmitted to susceptible individuals to cause chickenpox but there is no evidence that herpes zoster can be acquired from another individual with chickenpox. Although more common in the elderly, it is especially common in individuals of any age with impaired immunity.

Varicella vaccine is recommended for susceptible healthcare workers/students who have direct patient contact. Those with a definite history of chickenpox or shingles can be considered protected. Healthcare workers/students with a negative or uncertain history of chickenpox or shingles need to be serologically tested and vaccine offered to those without the varicella zoster antibody. Adults receive two doses of varicella vaccine, four to eight weeks apart. A recent survey showed that a history of chickenpox is a less reliable predictor of immunity in individuals born and raised overseas and serological testing may be needed in these workers/students.

Occupational health advice regarding varicella can be provided by occupational health service both at the pre-employment stage and at the in-employment stage.

### **Exposure prone procedures definition**

Exposure Prone Procedures as defined by the Department of Health (EPP): Exposure prone procedures are those where there is a risk that injury to the worker may result in the exposure of the patients' open tissues to the blood of the worker. These procedures include those where the worker's gloved hands may be in contact with sharp instruments, needle tips or sharp tissues (spicules of bones or teeth) inside a patients open body cavity, wound or confined anatomical space where the hands or fingertips may not be completely visible at all times

All information and further links are available on the Occupational Health Services web page on the Leeds Teaching Hospitals NHS Trust Intranet.