THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

MEDICAL AND HEALTH SCIENCES

Immunisation and Prevention of Infectious Diseases

Contents

1. Entry to MBChB – Immunisation Status Report (ISR)

1.1. Policy

Health care workers need to be protected from diseases they will encounter and need to have evidence they have the necessary protection to be allowed to work. In addition, the Faculty of Medical and Health Sciences (FMHS) needs to assure health training providers that students are unlikely to transmit serious infections either to patients or to other health care workers during their training in clinical environments.

1. The FMHS, through the services of the University Health Services at Grafton, requires all undergraduate medical students to know their immunity and infection status by having the following tests done:
   - Blood tests to determine immunity to Hepatitis B and C, Rubella, Measles, Mumps and Varicella zoster.
   - Blood tests to detect chronic infection with Hepatitis B or C.
   - Quantiferon Gold TB test in association with a completion of a TB questionnaire to determine TB status.

   These will be completed at the commencement of Year 2 (or Year 4 for those students transferring into the programme at that time).

The testing and administration charges for the above tests and required re-tests after vaccination will be met by FMHS only when conducted through the University Health Service.

2. Students are expected to be up-to-date with other vaccines – tetanus, diphtheria and polio.
   Evidence of Pertussis vaccination within the preceding 4 years is required.

In addition, they are advised to review their immunisation status with regard to infections that they may be at increased risk of acquiring as the result of changes in living situations (e.g. hostel or student flat accommodation, new relationships, etc). Students are strongly encouraged to consider annual immunisation with Influenza vaccine, a single dose of a conjugated Meningococcal C vaccine (such as Menactra) and three doses of HPV vaccine (if not previously immunised).

3. For those with negative tests the following are required:
   - Vaccination for Measles, Mumps and Rubella (a single dose)
   - Vaccination for Varicella zoster (two doses)
   - Vaccination for Hepatitis B (three, doses with four weeks between each dose). The vaccination will be followed up with a blood test to confirm immunity.

   The charges associated with immunisation or follow up chest X-rays or other testing will not be covered by FMHS and are the student's responsibility.

4. The test results are to be collated on the Immunisation Status Report Form (ISR) and signed by the GP/ University Health Services. The ISR with copies of test results attached should be submitted by the student to the MPD by 1 May after entry to the programme. These will be held on file in the MPD office separate from academic files. A student receiving further immunisations and follow-up tests will need to advise MPD of the need for an extension to this date.

It is the student's responsibility to provide the completed ISR as evidence of compliance with the policy. Noncompliance may lead to preventing the student having contact with patients until adequate clearance and immunity is demonstrated and/or referral to the Directors of Medical Student Affairs if considered a potential Fitness to Practise issue.

1.2. Student actions

Upon entry to MBChB each student must take the ISR form (sent out with offer of place) to the Student Health Service (or their Medical Practitioner) and request the set of antibody tests outlined on the specified form.

Positive TB results may need further investigations. Further TB information is available on: www.arphs.govt.nz/health-information/communicable-disease/tuberculosis

When the student shows acceptable immunity to the above diseases and is clear of TB or risks for transmission of other infections the medical practitioner should sign off the ISR form and the student should submit it, along with copies of test results, to the

MPD office
Building 501, Room 010
Faculty of Medical and Health Sciences
85 Park Road
Grafton

The deadline for submission of the completed ISR, or notification of delayed results, is 1 May each year.

Students who lack immunity should be vaccinated (if appropriate) and then have repeat testing for antibody response after allowing time for this to occur. The ISR can then be completed when an antibody response is demonstrable.

1.3.Summary of policy & guidelines: immunisation status testing

The following tables outline immunisations which should be reviewed by every student.

Table 1 lists required immunisation status testing and follow-up action.
Table 2 lists other recommended immunisations

Table 1: Required immunity status assessment

Student group	Testing for	Results on ISR form	Further action	Comment
Year 2	Varicella Zoster virus antibody	Clear history of chicken pox exists or VZV antibody +ve	None	If clear history of chicken pox exists no testing is needed otherwise testing is required. If exposed, non-immune contacts may develop chicken pox and pose risks to vulnerable patients. Non-immune students risk being stood down with consequent significant disruption to clinical training schedules.
		No history of chicken pox and VZV antibody -ve	Vaccinations (x2) with follow-up blood test required	
	Measles/ Mumps/ Rubella antibodies	+ve	None	See above for non-immune contact risk.
		-ve	MMR 11 vaccinations (X2, given at least 4 weeks apart)& follow up with further blood test	
	Hepatitis B antibody	+ve	None	See above for non-immune contact risk.
		-ve	HBV vaccinations (x3) & follow up with further test	
	Hepatitis B surface antigen	-ve	None	
		+ve	Refer to hepatologist for discussion re management	Refer to Directors of Medical Student Affairs for referral for career advice
	Hepatitis C antibody	-ve	None	
		+ve	Refer to hepatologist for discussion re management	If further testing (HCV RNA) confirms HCV infection refer to Directors of Medical Student Affairs for referral for career advice
	Quantiferon TB Gold test	-ve	None	
		+ve	Assess in conjunction with questionnaire – may need follow up with Chest XRay	Follow Public Health guidelines

Year 2	Pertussis	Vaccination date	There is no reliable test for Pertussis immunity so evidence of vaccination less than four years ago is required	If exposed, non-immune contacts are very likely to become infected after exposure to patients with pertussis and then pose risks to vulnerable patients. These students risk being stood down after such exposures, with consequent significant disruption to clinical attachment schedules.

Table 2: Other immunisations to be considered

Target Group	Vaccination	Record on ISR	Further action	Comment
All students annually	Seasonal Influenza	No	Vaccination highly recommended	Recommended annually to protect themselves, patients and reduce community spread
All students	Diphtheria Polio Tetanus	No	Vaccination highly recommended	Most students will have completed vaccination in childhood. Booster recommended around age 20.
All students	Meningococcal C	No	Vaccination with conjugate vaccine Menactra recommended	Recommended for all students.
All students	HPV	No	Highly recommended for all students	Many female students will have completed vaccination
Some students	Haemophilus influenza B Pneumococcal vaccine Hepatitis A Typhoid Yellow Fever	No		May be recommended in particular circumstances e.g. on electives in developing countries

2. Prevention of transmission of infectious diseases

The section provides background/ rationale to FMHS entry testing and immunisation requirements and to other infection-related clinical attachment health issues.

2.1. Risks of transmission

From patients to students

As a medical student, and later as a doctor, you will be exposed to infection, especially when you have direct contact with patients. The infections you may be exposed to include respiratory viruses, bacteria or viruses causing diarrhoea, bacteria, fungi or viruses causing skin diseases, and viruses present in patients' blood such as Hepatitis B virus, Hepatitis C virus or HIV.

From students to patients

Similarly you may be a potential source of infection for your patients. The infections you

may potentially transmit to your patients include respiratory viruses such as cold viruses or influenza, bacteria colonising your skin such as Staphylococcus aureus, and viruses which may be present in your blood such as Hepatitis B virus, Hepatitis C virus or HIV.

The guidelines below are intended to help you minimise the risk of transmission of infection between you and your patients.

2.2. Standard precautions and isolation precautions

The FMHS will require you to be familiar with the strategies used to minimise the risks of transmission of infectious diseases between health care workers and their patients.

Hand hygiene, gloves, masks, gowns, etc

Guidelines to minimise the transmission of infection between Health Care Workers and their patients are widely published and provide advice about appropriate measures to reduce exposure to blood or contaminated bodily secretion from a potentially infected person.

www.handhygiene.org.nz

The relevant advice contained in these guidelines includes that:

1. Hands should be cleaned using an alcohol-based hand-gel or with soap and water, before and after all patient contacts.
2. Gloves should be worn for touching mucous membranes or non-intact skin of all patients and for performing venepuncture and other vascular access procedures. Gloves should be changed after contact with each patient. All open lesions, i.e. fresh cuts, grazes or areas of moist eczema/dermatitis should be covered by non-permeable dressings.

2.3. Advice and information about vaccine preventable infections

Refer to Section **1.3 Summary of policy & guidelines: immunisation status testing**. This section provides background information and some advice, to support the policy.

Measles, Mumps and Rubella

Measles, Mumps and Rubella continue to cause disease in New Zealand. While most adults will have acquired immunity to disease by vaccination or natural infection, all students will be tested for immunity to measles, mumps and rubella; those who are not immune must receive two doses of MMR (measles, mumps, rubella) vaccine given at least four weeks apart.

Pregnancy should be avoided for four weeks after the MMR vaccination because of concern that the vaccine strain could cause fetal infection. Other contraindications to MMR vaccine are: anaphylactic reaction to Neomycin; febrile illness at the time when presenting for vaccination; active tuberculosis; treatment with immunosuppressive therapy; bone marrow and lymphatic system malignancies; blood disorders; primary immunodeficiency states.

Hepatitis B

Hepatitis B is relatively common in Māori, Pacific and Asian people in New Zealand. Most adults will have acquired immunity following childhood vaccination. However some students may not have been vaccinated or the course of vaccine given may not have induced effective immune responses. All students will be tested for immunity to Hepatitis B; those who are not immune and not chronically infected must receive a course of Hepatitis B vaccinations with follow-up testing to ensure immunity has been achieved. Blood donations should be deferred for 24 hours following Hepatitis B immunisation.

Varicella

Most students will have been infected by Varicella virus during childhood. Many will have had an obvious episode of chickenpox at this time but in many the illness will have been subclinical. Approximately 10% of students will be susceptible to Varicella infection. These students may acquire the infection from a person (e.g. a patient or other health care worker) and then may transmit it to a patient. This may have severe consequences if the patient is immunocompromised. Two doses of Varicella vaccine given six weeks apart induce immunity in most adults, and are required by all students who do not have a clear history of chicken pox or who do not have Varicella antibodies.

Tuberculosis

Tuberculosis is an uncommon disease in New Zealand. However, many medical students and other health workers will be exposed to infected patients and thus be placed at a significant risk of developing tuberculosis (TB). Students need to know their TB status.

From 2009 the FMHS replaced the Mantoux test with the more convenient Quantiferon Gold TB test as the required guide to a person's exposure or immunity to tuberculosis.

Students are not required to have the BCG vaccination. However health workers sometimes request BCG vaccination if they anticipate that they will be working regularly with known tuberculosis patients.

BCG is a live attenuated (weakened) strain of Mycobacterium bovis and is closely related to Mycobacterium tuberculosis – the usual cause of tuberculosis. BCG vaccination can reduce the risk of developing tuberculosis but the benefit is greatest in infants who are at a high risk of infection (especially those living in poor countries with a high prevalence of TB). BCG vaccination of adults provides only modest protection against tuberculosis – some studies have even suggested that the vaccine may increase risk of tuberculosis. BCG vaccination commonly causes a shallow ulcer at the site of the injection, which may take weeks to heal.

Further information about tuberculosis and BCG vaccination is available in The Immunisation Handbook 2014, Chapter 20: Tuberculosis; available as an electronic publication of the NZ Ministry of Health at: http://www.health.govt.nz/publication/immunisation-handbook-2014-2nd-edn

Pertussis

Recently, Pertussis (Whooping Cough) has occurred in epidemics approximately every four years in New Zealand. Many adults will have acquired immunity to disease by vaccination or natural infection, however immunity following either disease or vaccination wanes within a decade. Therefore a history of vaccination within the last four years is required for all students starting their clinical attachments, irrespective of previous history of pertussis or vaccination.

Diphtheria

Diphtheria is extremely rare in New Zealand, but in third world countries may be contracted either by inhalation of infected droplets or by skin contact with infected material. Students who had a full course of diphtheria vaccinations in childhood are likely to have life-long protective immunity. Booster doses are recommended at age 11, 45 and 65 years. A course of three injections of diphtheria vaccine (low dose for adults) given at intervals of four weeks is recommended for persons who have not previously been immunised.

Tetanus

Tetanus is an uncommon disease in New Zealand. Students who had a full course of tetanus vaccinations in childhood are likely to have life-long protective immunity. Booster doses are recommended at ages 11, 45 and 65 years. A course of three injections of tetanus vaccine given at intervals of four weeks is recommended for persons who have not previously been immunised.

Poliomyelitis

Poliomyelitis is extremely rare in New Zealand, but in a small number of third world countries it may be contracted by consuming contaminated food or drinks. Students who had a full course of polio vaccinations in childhood, and who are neither in contact with patients with polio nor travellers to countries where polio is common, do not require further polio vaccinations. Two injections of inactivated polio vaccine given at an interval of four weeks, followed by a third dose at 6 months, is recommended for adults who have not previously been immunised.

2.4. Risk of transmission from students to patients

The FMHS requires that you are tested for infection with HBV, and HCV. Students who recognise that they are at particular risk for acquisition of HIV infection (e.g. via sexual contact with at risk persons or via intravenous drug use) have a responsibility to also be tested for HIV. Students who are found to be infected with HBV, HCV or HIV must seek advice about practise precautions to prevent transmission of infection to their patients.

Hepatitis B

Hepatitis B infection is relatively common (approximate prevalence of 8%) in Māori, Pacific and Southeast Asian people aged over 30 years living in New Zealand. Most chronically infected persons have acquired the infection perinatally and are asymptomatic and unaware of their chronically infected status.

Hepatitis B virus (HBV) infection is transmitted from person to person in blood and blood contaminated secretions and body fluids. Blood and body fluids from some infected persons are highly contagious. Many examples of transmission of HBV infection from a health care worker to patients have been recognised. Most have involved dentists or surgeons who were exceptionally infectious. The dentists who transmitted infection to their patients had commonly not been wearing gloves during dental procedures, and the surgeons who transmitted infection to their patients most commonly did so during major procedures with a high risk of puncture of the surgeon's gloves during the operation. The estimated average risk of transmission of HBV infection with a needle stick injury when the injured person has not been vaccinated and the needle is contaminated by blood from an HBV infected person is approximately 15%.

Hepatitis C

Approximately 0.5% of the adult population in New Zealand has chronic Hepatitis C infection. This is usually an asymptomatic infection and many infected patients will not be aware of it. Increased rates of infection are found in people who have received blood products before 1992 and in current or ex injecting drug users. Hepatitis C may be transmitted by contact with infected blood e.g. a needle stick injury. The estimated average risk of transmission with a needle stick injury when the needle is contaminated by blood from an HCV infected person is approximately 3%.

HIV

Human Immunodeficiency Virus (HIV) infection in New Zealand is largely confined to men who have sex with men and to people from third world countries and their sexual partners. The prevalence of HIV infection in medical students and other health care workers is likely to be very low – probably less than 0.1%. A significant minority of HIV infected persons are unaware that they are infected, although they may recognise that their behaviour has placed them at risk to this infection.

HIV infection is transmitted in blood and blood contaminated secretions and body fluids. Transmission of HIV from a dentist with AIDS to three of his patients has been recognised. In

contrast, follow-up of over 2,000 patients and HIV testing of 691 patients operated on by three surgeons with HIV infection or AIDS has failed to reveal any instance of transmission of infection from these surgeons to their patients.

HIV is much less contagious than HBV; the estimated average risk of transmission with a needle stick injury when the needle is contaminated by blood from an HIV infected person is approximately 0.3%.

Career implications of HBV, HCV or HIV infection

The identification of students who have HBV, HCV or HIV infection is an essential step to helping those students prevent transmission of these infections to their patients during the course of their careers as health care workers. However the process of identifying HBV, HCV or HIV infection in a student can potentially have significant adverse effects for the student. These adverse effects could include anxiety about their health, stigmatisation, and reduced career opportunities. The FMHS will make every effort to mitigate the adverse effects that knowledge of infection with HBV, HCV or HIV may have for a student. Infected medical students are required to discuss their situation confidentially with the Directors of Medical Student Affairs as early as possible in their studies so that appropriate options can be explored and strategies developed.

Exposure prone procedures

Health care workers with a blood-borne virus infection must not perform any exposure prone procedures, unless they have received advice from an appropriate panel, which confirms the safety of them performing such procedures.

Exposure prone procedures are those invasive procedures where there is a risk that injury to the student may result in the exposure of the patient's open tissues to the blood of the student (bleed-back). These include procedures where the worker's gloved hands may be in contact with sharp instruments, needle tips or sharp tissues (e.g. spicules of bone or teeth) inside a patient's open body cavity, wound or confined anatomical space where the hands or fingertips may not be completely visible at all times.

Procedures where the hands and fingertips of the student are visible and outside the patient's body at all times, and internal examinations or procedures that do not involve possible injury to the student's gloved hands from sharp instruments and/or tissues, are considered not to be exposure prone provided routine infection control procedures are adhered to at all times. Examples of non-exposure prone procedures include:

- Taking blood (venepuncture).
- Setting up and maintaining intravenous lines or central lines (provided any skin tunnelling procedure used for the latter is performed in a non-exposure prone manner).
- Minor surface suturing.
- The incision of external abscesses.
- Routine vaginal or rectal examinations.
- Simple endoscopic procedures.

2.5. Risk of transmission from patients to students

Students are at risk of becoming infected with HBV or HCV or HIV as the result of contact with blood or other contaminated secretions from infected patients. The risk of becoming infected by an accident involving blood from a patient with hepatitis B or hepatitis C or HIV infection is affected by the nature of the injury. For each of these viruses the greatest chance of transmission is by a deep injury that inoculates a large amount of blood into the injured

person's tissues. For example a deeply penetrating needlestick with a large-gauge hollow-bore needle containing infected blood is much more dangerous than an accident in which blood is spilt onto unbroken skin.

Successful vaccination against HBV provides absolute protection against infection with this virus, but there is no effective vaccine available against HCV or HIV.

Treatment with intravenous or intramuscular injection of anti-HBV immunoglobulin reduces the risk of infection with HBV if given soon after exposure to HBV infected blood or body fluids. This treatment is appropriate in persons who have not mounted an adequate immune response to HBV vaccination.

Treatment with anti-retroviral drugs significantly reduces the risk of infection if given soon after exposure to HIV infected blood or body fluids. This treatment is appropriate in persons who have suffered a significant injury involving exposure to blood or body fluids from a person with uncontrolled HIV infection.

There is no effective treatment to prevent infection with HCV after exposure to HCV infected blood or body fluids.

Students who suffer an injury that involves exposure to blood or body fluids from a patient known or suspected to have HBV, HCV or HIV infection should promptly (within 1-2 hours) seek advice about management of this exposure either from the Occupational Health and Safety Department or from the Adult Infectious Disease team at the hospital where the accident occurred or from the hospital Emergency Department, or from University Health Services.

2.6. Key principles

1. All health care workers have ethical and legal duties to protect the health and safety of their patients. They also have the right to expect that their confidentiality will be respected and protected.
2. The duty of confidentiality is not absolute. Legally, the identity of infected individuals may be disclosed with their consent, or without their consent in exceptional circumstances, where it is considered necessary for the purpose of treatment, or prevention of spread of infection.
3. [Note that this accords with the New Zealand Health Practitioners Competence Assurance Act. 2003, Section 35 (1): "Whenever an authority that a health practitioner is registered with has reason to believe that the practise of the health practitioner may pose a risk of harm to the public, the authority must promptly give the following persons written notice of the circumstances that have given rise to that belief: The ACC, Director General of Health, Health and Disability Commissioner, and person who, to the knowledge of the authority, is the employer of the health practitioner.]
4. Health care workers with a blood-borne virus (Hepatitis B, Hepatitis C, or HIV) infection must not rely on their own assessment of the risk they pose to patients.
5. A health care worker who has any reason to believe they may have been exposed to a blood-borne virus, in whatever circumstances, must promptly seek and follow confidential professional advice on whether they should be tested for the virus. Failure to do so may breach the duty of care to patients.
6. Health care workers who are infected with blood-borne viruses must promptly seek appropriate expert medical and occupational health advice. Those who perform or who are expected to perform exposure prone procedures must obtain further expert advice about modification or limitation to their work practises to avoid exposure prone procedures.

3. Infectious diseases and overseas travel

Students travelling to developing countries where there may be increased risk of infection with diseases of poverty should seek consultation, before travel, to determine risks of infection followed by provision of advice, vaccination and prophylaxis as appropriate. This consultation, advice and treatment may be provided by the University Health Service Grafton or by the student's family doctor or travel medicine specialist.

Students returning from countries were tuberculosis is endemic should visit the University Health Service Grafton or their family doctor or travel medicine specialist on their return, to discuss any follow-up testing required.

Malaria, typhoid, hepatitis A, meningococcal infection, cholera etc.

Students travelling to countries where there is an increased risk of acquiring these infections should seek advice from the University Health Service Grafton, their own general practitioner, or an infectious disease physician or microbiologist regarding prophylaxis. Students expecting to work in areas with a high prevalence of HIV infection may seek a "starter pack" of anti-retroviral drugs to use in the event of a significant injury.

4. Methicillin Resistant Staphylococcus aureus

4.1. Background

Approximately 25% of the normal population are colonised in the anterior nares with Staphylococcus aureus. Approximately 10% of isolates of Staphylococcus aureus are resistant to methicillin and related antibiotics such as flucloxacillin. These resistant isolates are known as MRSA. The prevalence of colonisation, and disease, due to MRSA, is increased in some population groups and in the patients in some hospitals. Many hospitals in New Zealand have concerns about the introduction of MRSA into their environment by health care workers who have transferred from other hospitals where MRSA patient colonisation rates are high. These hospitals may request that newly arrived staff members or students, have nasal swabs collected to screen for MRSA colonisation and have a clear result before the staff member commences clinical duties.

Students need to anticipate this possibility as they move from one hospital to another and seek updated hospital specific information in advance to avoid loss of clinical access time.

4.2. Policy

1. All medical students involved in clinical environments are required to complete an assessment for the transmission risk of Staphylococcus aureus (whether methicillin sensitive S. aureus - MSSA or methicillin resistant S. aureus - MRSA) at least annually.
2. The assessment is an online (or paper) survey containing questions developed by the FMHS working party on Immunisation and MRSA. The questions relate to identifying those health conditions which would increase the risk of transmission if colonised with S. aureus (SA).
3. The survey is conducted annually by the MPD and monitored for compliance. Students who do not complete the survey will be referred to the Directors of Medical Student Affairs. Non-compliance may be considered a Fitness to Practise issue.
4. Students who answer YES to any question will be referred to University Health Services for follow up assessment, appropriate swabbing, and if necessary, treatment and re-testing. Colonisation by methicillin resistant Staphylococcus aureus will be tested for.
5. MPD will issue dated clearance certificates in the form of pdf documents. The

electronic certificate file will be stored independent of the academic file.

6. Students are encouraged to present their clearance certificates when starting clinical attachments at each new health provider / District Health Board. Almost all host District Health Boards have indicated acceptance of these certificates in place of swab results.

7. Notwithstanding any agreements indicated in item 6, FMHS respects the right of institutions to request MRSA swabs prior to allowing a student patient contact and it is the student's responsibility to check requirements (at least three weeks prior to starting an attachment) to avoid losing patient contact time pending the outcome of swabbing.

8. Students who have been required to be swabbed (as in item 7) or students who suspect they may be at risk of transmission (regardless of their certified status) may self-refer to University Health Services at any time for assessment. This includes those who are concerned about an especial risk of MRSA contact either in New Zealand or overseas.

9. The cost of swab testing (when requested by University Health Services) will be met by FMHS. Students are required to pay for any treatment costs.