Sanford School of Medicine of The University of South Dakota

INFECTION CONTROL MANUAL

Revised: May 2009

Introduction: General Student Safety Guidelines (Infection Control / Student Safety)

The scope of the term "Infection Control" is all encompassing and includes, but is not limited to prevention, treatment, infection control, microbiology, pharmacology and epidemiology. The purpose of this section of the student manual is to provide guidelines for the *prevention of acquisition* of an infectious disease by the student from the patient or environment and the *prevention of transmission* of an infectious disease from student to the patient (or patient to patient via the student). The safety techniques (i.e. HAND HYGIENE #1) presented here will serve to prevent *both* acquisition and transmission of infections and therefore are called STANDARD PRECAUTIONS.

Additional precautions may be necessary and are called TRANSMISSION-BASED PRECAUTIONS.

However, no matter how careful one is and no matter how carefully one adheres to STANDARD PRECAUTIONS and TRANSMISSION-BASED PRECAUTIONS, accidents and exposures can happen – accidents/conditions that may expose you to an infectious agent. It is important for students to be aware of the process of reporting accidents in pursuit of treatment and/or prophylaxis where appropriate. In case of an accidental exposure to bloodborne pathogens or other infectious agents, following the SPECIFIC, organism-based guidelines may save your life!

STANDARD PRECAUTIONS:

- Must be used in the care of all patients, regardless of diagnosis.
- Requires the use of appropriate barriers (Personal protective equipment – PPE, (gloves, eye protection, masks, gowns, face shields) as needed to prevent contact with blood, body fluids, secretions, excretions and contaminated items. Gloves are single use and disposable.
- Requires hand hygiene; handwashing (15 seconds with antimicrobial soap and warm water) or use of an appropriate antiseptic hand cleanser, after glove removal and before and after patient contact. Hand hygiene may be required between tasks or procedures on the *same* patient to prevent cross contamination of different body sites. Other times hand hygiene is important: when coming on duty, after use of toilet facilities, after blowing or wiping nose or coughing, before and after eating, before going off duty. When hands are visibly soiled, wash with antimicrobial soap and water, instead of hand antiseptic cleanser.
- Disposable sharps with engineered safety features will be used at all times in compliance with OSHA Standards to reduce risk of occupational exposure to bloodborne pathogens due to percutaneous injuries from contaminated sharps. These will have safety feature activated after use and prior to disposal. Sharps must be disposed of in an appropriate sharps disposal puncture-proof container immediately after use. Needles will not be recapped, broken or disassembled before disposal.
- Laboratory specimens from all patients are collected in designated containers and placed for transport in bags labeled with the biohazard symbol.

TRANSMISSION BASED PRECAUTIONS:

Airborne Precautions:

o To be used for patients known or suspected to have microorganisms transmitted by small airborne droplet nuclei (e.g. tuberculosis, measles, varicella).
o Requires a private room for the patient with negative air pressure to surrounding areas, and 6-12 air exchanges per hour.
o Requires respiratory protection (usually a disposable, particulate respirator) when entering the room if the patient is known or suspected to have tuberculosis or other airborne pathogens.
    o Fit testing is required if respirator is indicated.
o Susceptible individuals should not enter the room of patients known or suspected to have measles or varicella. If susceptible persons must enter the room they should wear respiratory protection. Immune individuals need not wear respiratory protection.

Droplet Precautions:

o Used for patients known or suspected to have microorganisms transmitted by large particle aerosols generated by coughing, sneezing or talking (e.g. *Haemophilus influenza*, *Neisseria meningitidis*, Group A Streptococcus, pertussis, rubella, adenovirus, influenza, mumps, parvovirus).
o Private room for patient if possible. If a private room is not available, patients should be cohorted (grouped with similar disease), if possible, or require special separation of at least three feet between patients. Special air handling and ventilation are not required.
o Requires the uses of disposable particulate respirators when within three feet of the patient.

Contact Precautions:

o Used in caring for patients known or suspected to have epidemiologically important microorganisms that can be transmitted by direct contact with patient and/or contaminated environmental surfaces (e.g. MRSA, multidrug resistant bacteria, *Clostridium difficile* and other agents that cause diarrhea, respiratory syncytial virus (RSV, parainflunza, herpes simplex, varicella zoster, agents causing wound, skin or conjunctival infections, scabies and lice).
o A private room should be used, if possible. Cohorting or consultation with infection control personnel should be accomplished if a private room is not available.
o Requires the use of gloves when entering the room. Gloves should be changed after contact with infective material and removed after leaving the patient environment. Hand hygiene should be performed immediately after glove removal.
o Usually requires the use of gowns and masks if contact with patient or patient's environment is anticipated. For patients with diarrhea, a private room with a private bathroom is preferable. If not available, a private commode should be available at bedside.

SPECIFIC STUDENT SAFETY GUIDELINES
(General information, Prevention, Prophylaxis/Treatment)

This section of your manual briefly summarizes the specific exposures you might have, the prevention strategies that must be followed and the treatment/prophylaxis available. In case of accidental needlesticks or injury with other contaminated sharp objects (scalpel) or exposure to an infectious agent where treatment or prophylaxis is available, it may be a specific hospital Infection Control Program or Emergency Room or Clinic nurse that will walk you through the reporting and treatment/prophylaxis process for that institution. Note the Internet links to the published recommendations from the Centers for Disease Control in Atlanta, Ga. Use this information to be your own advocate in ensuring your proper follow-up.

ANY exposure to patient blood and body fluids – percutaneous, splash into eyes, mucous membranes or onto already injured skin – may carry with it organisms that can kill and/or severely compromise your life (i.e. HIV). There are NO exposures minor enough to ignore; ALL exposures must be reported – for your safety.

HEPATITIS B VIRUS (HBV)

General: Hepatitis B exposure may result in acute liver disease with or without jaundice, subclinical disease or chronic infection. After a needlestick accident from a HBV infected person to an unimmunized person, risk of infection ranges from 3-30%.

Prevention: ALL students are required to receive HBV vaccination (3 doses at 0, 1 and 6 months) prior to any clinical patient contact. This will result in successful immunization in 95% of healthy young adults. Side effects are minimal. Test for anti- HBs (antibodies to HBV surface antigen) should be performed 1-2 months after completion of the vaccination series. Students admitted with *documented* prior vaccination history must also provide immune status documentation. If that is not available, current immune status will also be determined. Those who do not seroconvert should be revaccinated with a full series. If after a second series, titers remain below 10mIU/mL, the person is considered at risk for acquiring HBV. Strict adherence to the principles of STANDARD PRECAUTIONS is important in disease prevention as well as vaccination.

Prophylaxis / **Treatment** / **Follow-up:** If you are exposed to HBV and you have been vaccinated and your post vaccination titer showed immunity, you are protected from HBV infection. If, however, you have never tested immune to HBV or you don't know your status, the patient will be tested for HBV and/or risk factors for HBV will be determined. If the patient is positive, you should receive HBIG (Hepatitis B Immune Globulin) and possibly be vaccinated/revaccinated according to guidelines Table 3 of the following CDC publication.
http://www.cdc.gov/mmwr/PDF/RR/RR5011.pdf

HEPATITIS C VIRUS (HCV)

General: Hepatitis C exposure may results in acute, chronic or asymptomatic liver disease. Chronic disease and subsequent liver damage may progress to heptacellular carcinoma. Risk of infection after needlestick injury from a HCV positive patient ranges from 2%-10%.

Prevention: STANDARD PRECAUTIONS are essential for the prevention of HCV as neither vaccine nor reliable treatment is currently available. Use of barriers (gloves, etc.), hand hygiene, safe handling and disposal of sharps will reduce transmission to students and other health care workers.

Prophylaxis / **Treatment** / **Follow-up:** With HCV, prevention is all there is! There are no vaccines and no reliable treatments. You and the source patient will be tested for HCV (and for abnormal liver function) at the time of exposure and again in 4-6 months. If you have seroconverted during that time, your physician can follow your clinical course for signs of hepatitis.
http://www.cdc.gov/mmwr/PDF/RR/RR5011.pdf

HUMAN IMMUNODEFICIENCY VIRUS (HIV):

General: HIV acquisition will initially present clinically a week or so after exposure as a flu-like febrile illness that will spontaneously remiss. After these initial symptoms, the incubation period is long (as long as 10 years). The risk of transmission from needlestick exposures is 0.3%.

Prevention: STANDARD PRECAUTIONS are essential for the prevention of HIV exposure. No vaccines are available. However, rapid treatment with anti-retroviral drugs after an exposure *may* prevent transmission to you from an HIV positive patient.

Prophylaxis / **Treatment** / **Follow-up:** The advancement in treatment of HIV positive patients and experience with the anti-retroviral drugs has led CDC to recommend the prophylactic use of them after exposure to blood of HIV positive patients – PEP – post exposure prophylaxis. After exposure, your injury will be assessed for severity (i.e. splash on in-tact skin = low risk; percutaneous injection of blood with a hollow-bore needle = high risk). You will be tested for your current HIV status as a baseline and then 6 months later. The source patient will be tested for HIV using a rapid test with results available within 2 hours. Based on the risk of your exposure and the HIV status of the patient, recommendations will be made regarding the appropriateness of taking antiretroviral drugs (recommended duration is 1 month). If the decision is made to take the drugs, it should be done WITHIN 24 HOURS of the exposure! Within 2 hours is best; after 24 hours may still be effective. These drugs are not without side effects (listed in the reference below).

The decision to take anti-retroviral drugs may be difficult. Therefore, our Infectious Disease specialists (phone numbers on your pocket card) are available to you to assist the process.

The source patient testing is subject to patient consent and/or will follow state/federal regulations. You will receive pre- and post-test counseling to make sure you understand the implications of positive/negative test results.

Follow the recommendations on your Post Exposure Pocket Card. Summary:

1. Exposure decontamination: Good first aid
2. Documentation and Follow-up
3. Notification
4. Completing Report Forms

http://www.cdc.gov/mmwr/PDF/RR/RR5011.pdf

TUBERCULOSIS:

General: Tuberculosis (TB) (caused by the slow growing bacteria, *Mycobacterium tuberculosis* **and classified as an acid fast bacilli (AFB)** is again emerging as a major public health concern and strains have developed that are resistant to many anti-tuberculosis drugs. Health care workers have a greater risk than the general population for acquisition. Patients who are infected, but undiagnosed pose the greatest risk of transmission, and AIDS patients have been the source of a number of outbreaks nationally.

Prevention: Use of STANDARD PRECAUTIONS is essential. Adherence to AIRBORNE ISOLATION procedures (See above: private room, negative air flow, respirator use, etc.) for patients who have signs and symptoms of TB can greatly reduce TB transmission. The most important strategy for prevention of acquisition of TB is identifying the patients with disease so AIRBORNE ISOLATION and use of appropriate respirators by health care workers can be instituted.

Students will be tested for latent disease annually with the purified protein derivative (PPD) skin test and will be tested periodically if it is felt that exposure has occurred. The initial screening will be by the two-step method. If the first is negative, a second PPD will be given. The second negative will confirm lack of infection.

Prophylaxis / **Treatment** / **Follow-up:** If you are PPD negative upon entering your Medical School or Allied Health Sciences program, and positive at one of the annual tests, you are considered a converter.

You will be evaluated for signs and symptoms (cough, weight loss, night sweats, fever, etc.) of tuberculosis and have a chest x-ray. If all these are negative, you will be considered to have latent infection and treated with appropriate antibiotics (See reference below). If you are PPD positive on initial screening, your conversion occurred prior to starting this educational program. However, the same procedure will be followed. If there is a history of receiving BCG vaccine (a TB vaccine widely used in some other countries with high endemic tuberculosis), that will not impact on your testing or treatment of latent disease. If you have active pulmonary tuberculosis, you will be treated for active disease and your patient contacts will be limited until 3 weeks of therapy are complete and 3 sputum specimens are negative for AFB.
Students with a known history of a positive TB skin test/latent disease will complete a symptom checklist annually (see Appendix for form).
http://www.cdc.gov/mmwr/PDF/RR/RR4906.pdf
http://www.cdc.gov/mmwr/PDF/wk/mm4636.pdf

NEISSERIA MENINGITIS:
General: Meningitis, an inflammation of the meninges, is caused by a variety of organisms. However, the bacteria *Neisseria meningitidis,* causes a meningitis that is spread from person to person by close personal contact and has a high mortality rate (5-15%) even with early diagnosis and treatment. The disease is characterized by the sudden onset of fever, intense headache, nausea, vomiting, stiff neck and sometimes a rash.
Prevention: Health care workers caring for patients with this disease should follow STANDARD PRECAUTIONS and DROPLET PRECAUTIONS (See above) which includes the use of respirators. Vaccines are available, but are not routinely administered to health care providers.
Prophylaxis / Treatment / Follow-up: If you have been in CLOSE INTIMATE CONTACT with a patient with *N. meningitidis* meningitis, sepsis or respiratory disease, you may be advised to take prophylactic antibiotics. The primary antibiotic is rifampin which has some important side effects including discoloration of body secretions ("yellow tears"), inactivation of birth control pills and hepatitis and it should not be taken if pregnant. Alternative antibiotics are available and listed in the reference below. In the case of an outbreak, vaccination may be recommended to students.
http://www.cdc.gov/mmwr/PDF/RR/RR4907.pdf

INFLUENZA and OTHER RESPIRATORY VIRUSES:
General: Outbreaks of influenza occur in winter months. Infection is generally not serious in young, healthy people but may be fatal in those with underlying illness or the very young and elderly. Health care workers are at high risk for acquiring infection and transmitting it to patients.
Prevention: VACCINATION against influenza is effective in preventing/modifying infection and ALL students in patient care areas should be vaccinated yearly. New vaccine strains are identified by the World Health Organization and incorporated into a newly formulated vaccine each year. ANTIVIRAL DRUGS can also prevent influenza infections and/or reduce the severity of illness if it occurs.
Prophylaxis / Treatment / Follow-up:
1. You have been vaccinated, but you acquire influenza anyway (20-30% of those vaccinated may) ….
2. You have NOT been vaccinated (why?), and you get influenza……
3. You have NOT been vaccinated (why?), and your child brings influenza home from school and exposes you ……
There are 4 FDA approved antiviral agents for influenza A and B. Two of them (amantadine and rimantadine) treat influenza A only; the other two (zanamivir and oseltamivir) are effective against both influenza A and B. Laboratory tests can determine the strain and know what strain is in the community. These agents may be taken prophylacticly (#3 above) or as treatment (within 48 hours) to diminish symptoms and decrease days of illness. There are side effects of

the drugs and the following reference outlines their proper use. You may not continue with patient care activities if you have influenza until five days of treatment with an antiviral agent have elapsed.
http://www.cdc.gov/mmwr/PDF/RR/RR5103.pdf

VARICELLA ZOSTER VIRUS (VZV) (Chicken Pox / Shingles):
General: VZV causes varicella (i.e. chicken pox). The virus remains latent in the dorsal root ganglia and may recur as herpes zoster (shingles) many years later. Most adults have already had chickenpox and are immune to reinfection. VZV is highly contagious to those who are susceptible and the disease may be more severe if acquired in adulthood. The case/fatality ratio is 1/100,000 in children and 1/5,000 in adults.
Prevention: Students must demonstrate immunity to VZV by either laboratory testing (if the student has a history of the disease) or by vaccination (if titer is negative or there is no history of the disease). Varicella immunization is indicated if there no history of the disease or if the varicella titer is negative. Two doses are required (CDC MMWR Jan. 2007) at an interval of 4-8 weeks for people ≥ 13 years of age without evidence of immunity. A second catch up dose is required for those who had previously received one dose. Protection from VZV for the non-immune once again is dependent on your observation of STANDARD, AIRBORNE, and CONTACT PRECAUTIONS as the virus is spread by aerosol, droplet and direct contact of patient or environmental contamination.
Prophylaxis / Treatment / Follow-up: If you are non-immune and exposed to a patient (or contact) with varicella, the vaccine can be effective in preventing illness or modifying disease if given within 3 days and possibly up to 5 days of exposure.
Varicella zoster immune globulin (VZIG) is available for post exposure treatment, however, exposure specifics (direct/indirect contact, length of time, indoors/outdoors, etc.) and student vaccine/ varicella disease history need to be assessed before administration.

The antiviral agents acyclovir and vidarabine are available to treat serious disease in appropriate patients/students.

If you have been exposed to a child (or adult) with chickenpox and you are nonimmune, you may not continue with patient contact for 10–21 days following exposure.
http://www.cdc.gov/mmwr/PDF/RR/RR4806.pdf
http://www.cdc.gov/mmwr/PDF/RR/RR4511.pdf
http://www.cdc.gov/nip/vaccine/varicella/varicella_acip_recs_prov_june_2006.pdf

MUMPS:
General: A viral illness with acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting 2 or more days, and without other apparent cause. During the 2006 outbreak the age group most affected was young adults aged 18-24 years, many of whom were college students, however the outbreak was not limited to this age group and spread to all age groups. Transmission occurs through respiratory and oral secretions. The incubation period is usually 16-18 days but may vary from 14 to 25 days. Mumps is contagious seven days prior to and nine days after the onset of symptoms. A person is most contagious 28 hours prior to the appearance of symptoms.
Prevention: The single most effective control measure is maintaining the highest possible level of immunization in the community. Two doses of the MMR vaccine series for all children; with the first dose administered at ages 12-15 months and the second dose at 4-6 years. Two doses of the MMR vaccine are recommended for school and college entry unless the student has other evidence of immunity. In addition, two does are recommended for adults at high risk (i.e. heath-care workers, international travelers, and students at post-high school educational institutions). Futhermore, one dose of MMR is recommended to unvaccinated health-care workers born before 1957 who do not have other evidence of mumps immunity.

Prophylaxis / **Treatment** / **Follow-up:** To help stop the spread of mumps, the Centers for Disease Control and Prevention recommend exclusion of susceptible, exposed individuals. For susceptible individuals exposed to a mumps case or suspect case, the South Dakota Department of Health recommends that they remain home from the 12th day after the initial exposure through the 25th day after the last exposure (or longer if additional cases are identified). Complications of the mumps include swelling of the testicles in 15-25% of infected males. Mums can cause central nervous system disorders such as encephalitis and meningitis.
http://www.cdc.gov/nip/diseases/mumps/default.htm
http://www.state.sd.us/doh/Mumps/index.htm

PERTUSSIS:
General: A highly communicable, vaccine-preventable disease (caused by *Bordetella pertussis*, a gram-negative coccobacillus) that lasts for many weeks and is typically manifested in children with paroxysmal spasms of severe coughing, whooping, and post-tussive vomiting. Incidence of pertussis in the U.S. has increased steadily since the 1980s. In the fall of 2004 South Dakota reported a 500% increase over the number of cases normally seen by that time of year. Major complications are most common among infants and young children and include hypoxia, apnea, pneumonia, seizures, encephalopathy, and malnutrition.
Prevention: All students are required to receive a single dose of Tdap if they have not previously received Tdap and the tetanus/diphtheria toxoid has not been administered within the past 2 years. Transmission occurs through direct contact with discharges from respiratory mucous membranes of infected persons. The single most effective control measure is maintaining the highest possible level of immunization in the community. However, because the protective efficacy of pertussis immunization wanes after time, teenagers and adults are susceptible to pertussis, even if they were immunized as children. The Advisory Committee on Immunization Practices (ACIP) recommends the routine use of single-dose Tdap (tetanus, diphtheria, and acellular pertussis) vaccine for adults 19-64 years of age to replace the next booster dose of tetanus diphtheria toxoid (Td). Health-care personnel who work in hospitals or ambulatory care settings and have direct patient contact should receive a single dose of Tdap as soon as feasible with priority to those who work with infants aged <12 months.
Prophylaxis / **Treatment** / **Follow-up:** Exposed susceptible persons should receive chemoprophylaxis. Exposure is defined as face-to-face contact, direct contact with respiratory, oral, or nasal secretions, or being in the same room with a coughing pertussis patient. The exposed student should be queried daily for at least 21 days after exposure about possible pertussis symptoms -- acute cough, cough with paroxysms, whoop, or post-tussive gagging/ vomiting. Students with these symptoms should be given leave from work and allowed to return to work when they are well, another diagnosis is established, or they have been on appropriate antimicrobial treatment for 5 days.
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm

AGENTS TRANSMITTED PRIMARILY BY SKIN CONTACT or ENVIRONMENTAL CONTAMINATION:
General: Multiple drug resistant organisms (MDRO, i.e. methicillin resistant Staphylococcus aureus - MRSA, vancomycin resistant Enterococcus - VRE, etc) and enteric pathogens (*Clostridium difficile*, enterohemorrhagic *E.coli*, etc.) are easily spread from patients to health care workers, from health care workers to patients and to the environment in the hospital setting. The MDRO usually will NOT cause disease in the student, but the student might become colonized with the bacteria. The enteric pathogens may cause disease in the student as well as being passed on to other patients through person to person or environmental contact.
Prevention: Protection of the patient and health care workers: STANDARD

PRECAUTIONS are essential. CONTACT ISOLATION (See above) will be recommended for specific MDROs (i.e. MRSA , VRE or other resistant organisms) and for patients with diarrhea. The patient with diarrhea will remain in Contact Isolation until an infectious etiology of the diarrhea can be ruled out or the disease becomes self-limited. WASH HANDS! After contact with C-difficile patients since hand-antiseptic products to not work for C-difficile. Use antimicrobial soap and water. Your good antimicrobial stewardship in the practice of medicine and prescribing of antibiotics will assist greatly in prevention of MDRO!

Prophylaxis / Treatment / Follow-up: With good hand hygiene and good use of barriers (gloves, gowns, etc.) and following specific isolation recommendations you should not become colonized with a multiple drug resistant organism. However, if you do, under circumstances of an outbreak and you have been identified with the outbreak strain (molecular finger-printing), you may be asked to treat the site of carriage (usually the nasal passage for MRSA) to try to eradicate the organism. Colonization with a MDRO using proper techniques does not preclude patient contact. You should not have direct patient contact if you have diarrhea until seen and cleared by your physician.

http://www.cdc.gov/mmwr/PDF/RR/RR4412.pdf

SPECIAL CONSIDERATIONS:

1. STUDENTS WITH SKIN INFECTIONS, DIARRHEA or CONTAGIOUS DISEASES SHOULD CONSULT THEIR PHYSICIAN AND THE HOSPITAL/CLINIC INFECTION CONTROL PROGRAMS PRIOR TO PATIENT CONTACT.

2. HIV, HBV, HCV-infected Medical Student

There are two concerns: safety of patients and safety of the student. CDC has recommended that HIV, HBV, HCV positive health care workers:

- Use standard precautions – prevention of transmission of HIV, HBV, HCV from student to patient; prevention of transmission of infections to the student who may be immune compromised.
- Currently available data provide no basis for recommendations to restrict the practice of HCW's infected with HIV, HBV, or HCV who perform invasive procedures not identified as exposure-prone.
- Exposure-prone procedures should be identified by medical/surgical/dental organizations and institutions at which the procedures are performed.
- Health care workers who perform exposure-prone procedures should know their HIV, HBsAg and if positive, their HBeAg antibody status.
- Exclude HIV, HBV, HCV positive students from "exposure-prone" procedures or unless they have sought counsel from an expert review panel and been advised under what circumstances, if any, they may perform these procedures.
- Mandatory testing of students for HIV or HBsAg (or HBeAg) is not recommended.

These recommendations are controversial.

www.cdc.gov/mmwr/preview/mmwrhtml/00014845.htm
http://www.cdc.gov/mmwr/preview/mmwrhtml/00055154.htm

3. The Pregnant Medical Student

Pregnancy does not preclude a medical student from any activities related to health care responsibilities. Prior to pregnancy, the student should ensure all immunizations are up to date and know serologic status for measles, mumps, rubella, polio, varicella, and hepatitis B. During pregnancy, the student should receive influenza vaccine at the right time, maintain routine tuberculosis screening, adhere to proper infection control practices (Standard Precautions) and have prompt evaluation and treatment of any illness. The student will obtain the influenza vaccine and tuberculosis screening from her physician.

4. Health Insurance
All medical students are required to have health insurance.

5. Bioterrorism Issues
With the advent of 9/11 and the cases of anthrax in the fall of 2001, we have all become aware of our vulnerability to biological warfare and terrorism (bioterrorism). The diseases (organisms) listed as potential agents is lengthy (24 organisms / 12 organism-produced toxins in one list), 7 organisms were brought to the forefront as particular threats:
Anthrax (*Bacillus anthracis*)
Botulism (*Clostridium botulinum* toxin)
Brucella (*Brucella sp.*)
Cholera (*Vibrio cholera*)
Plague (*Yersinia pestis*)
Q fever (*Coxiella burnetti* - rickettsia)
Smallpox (Vaccinia virus)
Viral hemorrhagic fevers (several viruses)
It is beyond the scope of this manual to outline the specifics of all these organisms, diseases, preventions and treatments. Many valuable documents may be found via the Internet. As a USD student in the medical care field, you will be informed in case of suspected use of one of these agents and will be included in the decision processes regarding vaccination, prophylaxis and treatment. Since the experience in the fall of 2001 was with anthrax, the following two CDC documents address the guidelines for that disease:
Interim Guidelines for Exposure Management and Antimicrobial Therapy (Anthrax):
http://www.cdc.gov/mmwr/PDF/wk/mm5042.pdf
Interim Guidelines for Clinical Evaluation of Persons with Possible Anthrax:
http://www.cdc.gov/mmwr/PDF/wk/mm5043.pdf

1. Atlas, RM. Biological Weapons Pose Challenge for Microbiology Community: Microbiologists Should Help Shape Policies Protecting Against Biological Weapons but Safeguarding Legitimate Research. ASM News 1998;64:383-90.
2. CDC. Immunization of Health-Care Workers: Recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC). MMWR 1997;46(No. RR-18).
3. CDC. Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2002;51(No. RR-3).
4. CDC. Prevention and Control of Meningococcal Disease and Meningococcal Disease and College Students: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2000;49(No. RR-7).
5. CDC. Prevention of Varicella: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1996;45(No. RR-11).
6. CDC. Prevention of Varicella: Update Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1999;48(No. RR-6).
7. CDC. Recommendations for Preventing the Spread of Vancomycin Resistance Recommendations of the Hospital Infection Control Practices Advisory Committee (HICPAC). MMWR 1995;44(No. RR-12).
8. CDC. Recommendations for Preventing Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Patients During Exposure-Prone Invasive Procedures. MMWR 1991;40(No. RR-8).
9. CDC. Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection. MMWR 2000;49(No. RR-6).
10. CDC. Update: Investigation of Bioterrorism-Related Anthrax and Interim Guidelines for Clinical Evaluation of Persons with Possible Anthrax. MMWR 2001;50(No. 43).
11. CDC. Update: Investigation of Bioterrorism-Related Anthrax and Interim Guidelines for Exposure Management and Antimicrobial Therapy, October 2001. MMWR 2001;50(No. 42).
12. CDC. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis. MMWR 2001;50(No. RR-11).
13. Savoia, M. Infectious Diseases Handbook for Medical School Student Affairs Officers. AAMC, Washington, DC.1996.

THE UNIVERSITY OF SOUTH DAKOTA
HEALTH AFFAIRS IMMUNIZATION POLICY

With your entrance into the medical field it is important for your own personal safety, as well as that of your patients, that your immunizations are up to date and documented to ensure compliance with Center for Disease Control Guidelines and the affiliation agreements with multiple clinical sites***.***

Health Affairs Requirements:

- Students are required to follow the Immunization Compliance Policy of their specific program.
- For students in programs requiring full compliance with the USD Health Affairs Immunization Policy, the immunization form must be completed with the appropriate signatures. Include copies of titer reports and other medical records when applicable.

1. **Measles (Rubeola), Mumps, Rubella**. One of the following is required:
   A. All student born after December 31, 1956 are required to have medically signed proof of TWO properly administered immunizations (1st dose at age 12-15 months or later; 2nd dose at age 4-6 years or later; second dose must have been received 28 days after the first)
   OR
   B. Immune titers for measles (rubeola), mumps, and rubella.

2. **Hepatitis B immunization**. ALL students are required to receive HBV vaccination (3 doses at 0, 1 and 6 months). *The first two doses of the three dose series are required prior to the start of classes.*
   AND
   Hepatitis B titer.
   A. Test for anti-HBs or HbsAB (antibodies to HBV surface antigen) should be performed 1-2 months after completion of the vaccination series.
   B. Students admitted with *documented* prior vaccination history must also provide immune status documentation. If that is not available, current immune status will be determined by the titer.
   C. A copy of titer report must accompany immunization form or be provided as soon as it is available.
   D. Those who do not seroconvert should be revaccinated with a full series with the titer repeated 1-2 months after the last immunization. If after a second series, titers remain below 10mlU/mL, the person is considered at risk for acquiring HBV.

3. **Varicella/Chicken Pox immunity**. One of the following is required:
   A. Varicella titer if the student has had the chicken pox that indicates immunity (copy of titer report must accompany immunization form);
   OR
   b. Varicella immunization is indicated if there no history of the disease or if the varicella titer is negative. Two doses are required at an interval of 4-8 weeks for people ≥13 years of age without evidence of immunity.

4. **DTP** (**diphtheria, tetanus, pertussis)/Tdap (tetanus, diphtheria, adult pertussis).** Both of the following are required:
   A. Dates of childhood immunizations; ***OR*** three doses of any combination DTP/DTaP/DT/Td/Tdap vaccine.
   AND
   B. One time dose of Tdap (tetanus, diphtheria, adult pertusis) is required ***IF*** a tetanus/diphtheria toxoid has not been administered within the past 2 years.

5. **Polio**: Dates of childhood immunizations along with type of vaccine. Include date(s) of latest booster dose if applicable.

6. **TB Skin Tests or QFT-G Blood Test**.

A. **Initial Two-Step TB Skin Test:** Documentation of two TB skin tests 1-3 weeks apart is required. If the first is negative, a second TB skin test will be given in 1-3 weeks. The second negative will confirm lack of infection (any two documented TB skin tests completed within a 12 month period can meet this requirement.)

OR

B. **QuantiFERON-TB Gold Test:** (QFT-G) blood test.

C. **Annual TB Skin Test:** Students are required to have an annual TB Skin Test.

D. History of BCG vaccine is NOT a contraindication for tuberculin testing. TB skin test reactivity caused by BCG vaccine generally wanes with time. If more than 5 years have elapsed since administration of BCG vaccine, a positive reaction is most likely a result of *M. tuberculosis* infection.

E. **Students with a known history of a positive TB skin test**: Need to provide documentation of the results of chest x-ray and treatment. The student will complete a symptom checklist annually.

Recommended Immunizations:

- **Influenza vaccination.** Recommended annually for students in health professions. The influenza vaccine is available each November-December.

- **Meningococcal (meningitis) vaccine.** Recommended for students living in college dormitories who have not been immunized previously or for college students under 25 years of age who wish to reduce their risk.

Updated 4/28//2009

Please note that these are the requirements for the Sanford School of Medicine, however, students may be required to provide documentation of additional immunizations and/or titers when applying for externships.

6. Other diseases for which immunization of health-care workers is or may be indicated:

a. HAV
b. Meningococcal disease
c. Pertussis
d. Typhoid
e. Vaccinia

Consult the following CDC document for details. It includes recommendations for foreign travel as well.
http://www.cdc.gov/mmwr/PDF/RR/RR4618.pdf

SANFORD SCHOOL OF MEDICINE
The University of South Dakota

SANFORD SCHOOL OF MEDICINE
ANNUAL SYMPTOM CHECKLIST FOR TUBERCULOSIS

Date:_____ Student's Name:_____

In the last year have you experienced any of the following symptoms for more than three weeks at a time?

SIGN & SYMPTOM REVIEW:	YES	NO
Persistent cough		
Excessive sweating at night		
Unexplained weight loss		
Coughing up blood		
Excessive fatigue		
Persistent fever		

TB skin test: Year_____ Reading (mm)_____ Date of last chest x-ray_____

Chest x-ray results_____

Prophylactic treatment received? If yes; drug, dosage, and duration of treatment.

_____

_____

_____

_____ _____
Student's Signature Date

_____ _____
Education Coordinator's Signature Date

SANFORD SCHOOL OF MEDICINE
OF THE UNIVERSITY OF SOUTH DAKOTA
Occupational Exposure to Bloodborne Pathogens Protocol

1. **Decontamination:** Follow good **first aid** techniques including thorough flushing of mucous membranes and eyes, wound care if appropriate and thorough handwashing. There is no benefit from expressing blood at the site of the injury or application of caustic agents such as bleach.
2. **Notification:** It is the student's responsibility to report all suspected exposure incidents:
    a. **Immediately to Faculty Member/Supervisor.**
    b. **Immediately to Employee Health/Infection Control Personnel** in the clinical site where the exposure occurred. (If the clinical site does not provide post-exposure evaluation for students contact your Campus Education Coordinator.)
    c. **After initial management, return report form to your Campus Education Coordinator** (contact information follows).
3. **Documentation:** The student is required to report the following essential information to Employee Health/Infection Control Personnel *and* complete the Sanford School of Medicine Occupational Exposure to Bloodborne Pathogens Report Form (see #4).
    a. Procedure being performed, including where and how the exposure occurred.
    b. Type of exposure: puncture, scratch, bite, mucous membrane of the eye, nose, or mouth, or other.
    c. Extent of exposure: type and amount of blood/body fluid/material, severity of exposure including depth and whether fluid was injected, etc.
    d. PPE (personal protective equipment) worn at the time of exposure: gloves, gown, mask, protective eyewear, face shield, etc.
    e. Decontamination: handwashing, flushing mucous membrane of eye, nose, mouth, etc.
    f. First aid administered.
    g. Student's hepatitis B immunity status, last tetanus booster, etc.
    h. Source patient: known or unknown.
4. **Sanford School of Medicine Occupational Exposure to Bloodborne Pathogens Form:** This form may be downloaded from http://www.usd.edu/med/ . Do not delay seeking post-exposure evaluation for the purpose of retrieving the report form. However, it is the student's responsibility to complete the student section of the form (first page) and see that the medical professional doing the evaluation completes and signs the second page of the form. The student is required to bring the form to his/her Education Coordinator as soon as possible. Note this form is in addition to any forms required by the facility where the incident occurred.
5. **Questions/Concerns:** Contact the Sioux Valley Exposure Hotline available 24/7 if you have questions or concerns (contact information follows).
6. **Billing for Testing:** The student is not responsible for payment for post-exposure testing and therefore does not need to supply insurance information (contact information for billing follows).

CONTACT INFORMATION

REPORTING:

Marilyn Moor, RN – Sioux Falls:	357-1308
Sharon Saunders – Rapid City:	394-5105
Carol Pollman, RN – Yankton:	668-3066
Cathy Logue, RN – Vermillion:	677-5303

CONSULTATION:

Infectious Disease Specialists

Veronica Soler, M.D.	367-0267 (pager)
	782-2274 (clinic)
	357-1360 (HSC)
Wendall Hoffman, M.D.	328-8120

Sioux Valley 24/7 Exposure Hotline

Sioux Valley Exposure Hotline
During office hours (0630-1500): 366-5251
Or call Sioux Valley operator
and ask to be connected to an Infection Control Nurse: 333-1000
(note you may call this number regardless of where the incident occurred)

BILLING:

Kay Austin 677-5303
Sanford School of Medicine of The University of South Dakota
414 East Clark Street
Vermillion, SD 57069

University of South Dakota Health Affairs
REQUIRED IMMUNIZATON FORM

Name _____ **Date of birth** _____ **USD ID# (orSS#)**_____

Program: Alcohol Drug Studies☐ Dental Hygiene☐ Clinical Laboratory Science☐ Medicine☐
Nursing☐ Occupational Therapy☐ Physical Therapy☐ Physician Assistant☐ Social Work☐

Health Affairs Requirements:

- Students are required to follow the Immunization Compliance Policy of their specific program.
- For students in programs requiring full compliance with the USD Health Affairs Immunization Policy, this form must be completed with the appropriate signatures. Include copies of titer reports and other medical records when applicable.

REQUIRED IMMUNIZATIONS:

A. **MMR (Measles, Mumps, Rubella) Vaccine**. Two doses required for all students born after 12/31/56.

Dates: 1.____/____/_____ 2. _____/_____/_____

OR individual vaccine/proof of immunity as noted below.

a. **Measles** (Rubeola). Check all that apply:
☐ Vaccine Dates: 1.____/_____/_____ 2._____/_____/_____
☐ Has report of positive immune titer. Date:____/_____/_____ *attach copy of titer report*

b. **Rubella** (German Measles) Clinical history is not acceptable. Check all that apply.
☐ Vaccine Dates: 1.____/_____/_____ 2._____/_____/_____
☐ Has report of positive immune titer. Date:____/_____/_____ *attach copy of titer report*

c. **Mumps** Check all that apply.
☐ Vaccine Dates: 1.____/_____/_____ 2._____/_____/_____
☐ Has report of positive immune titer. Date:_____/_____/_____ *attach copy of titer report*

B. **Diphtheria-Tetanus-Pertussis**
Dates of primary series: 1._____/_____/_____ 2._____/_____/_____ 3._____/_____/_____
4._____/_____/_____ 5._____/_____/_____ Last Tetanus Booster (TT, Td) _____/_____/_____

AND

☐ **Date of Tdap (tetanus, diphtheria, adult pertussis):** Date:_____/_____/_____

C. **Polio**
Dates of primary series: 1._____/_____/_____ 2._____/_____/_____ 3._____/_____/_____
4._____/_____/_____ Type of vaccine: Oral (OPV)_____ Inactivated (IPV)_____

Booster **(optional):** Date:_____/_____/_____; Type of vaccine: Oral (OPV)_____ Inactivated (IPV)_____

D. **Varicella** (Chicken Pox) One of the following is required:
☐ Documentation of positive varicella titer. Date:_____/_____/_____ *attach copy of titer report*
(if negative, varicella immunization required)

OR

☐ Vaccine: Two doses are required at an interval of 4-8 weeks for people ≥13 years of age without evidence of immunity.
Dates: 1._____/_____/_____ 2._____/_____/_____

4/02//09

Name_____

E. **Hepatitis B Vaccine -** Three doses and positive titer required.

Name and Address of where immunization was obtained:

☐ 1st dose Date:_____/_____/_____ _____

☐ 2nd dose Date:_____/_____/_____(1 month after 1st dose) _____

☐ 3rd dose Date:_____/_____/_____ (6 months after 1st dose) _____

AND

Hepatitis B Titer (HbsAB or Anti-HBs – antibody to hepatitis B surface antigen)

☐ Immunity demonstrated by hepatitis B titer - *attach copy of titer report*.
Date:_____/_____/_____ Positive/Reactive_____ Negative/Nonreactive_____ (if neg. see immunization policy)

F. **Tuberculosis Skin Test -** PPD (Mantoux) – Two-step TB skin test required initially or TB Gold Blood Test.

☐ Two-Step TB Skin Test *Note any two documented TB skin tests completed within a 12 month period shall be considered a two-step.

Step 1 (Date placed) _____/_____/_____ Step 1 (Date read) _____/_____/_____ Results:_____mm
Step 2 (Date placed) _____/_____/_____ Step 2 (Date read) _____/_____/_____ Results:_____mm

If two-step was completed more than 12 months prior to start of class, one TB skin test within the past 12 months is required.
Date placed _____/_____/_____ Date read _____/_____/_____ Results:_____mm

OR

☐ QuantiFERON-TB Gold Blood Test (QFT-G): Date:_____/_____/_____ Positive_____ Negative_____
A*ttach copy of report.*

☐ History of Positive TB Skin Test**:** Date _____/_____/_____
Documentation of chest x-ray & treatment required.

☐ History of BCG vaccination: Date _____/_____/_____
TB skin test required regardless of prior BCG vaccination.

RECOMMENDED IMMUNIZATIONS:

☐ Meningococcal Vaccine (Meningitis vaccine). Recommended for students living in college dormitories who have not been immunized previously or for college students under 25 years of age who wish to reduce their risk.
Date:_____/_____/_____

☐ Influenza vaccine. Recommended annually for healthcare providers.
Date:_____/_____/_____

A copy of titer reports must be provided with this form as indicated above.

SIGNATURE X _____ **Date** _____/_____/_____
Must be signed by ***Physician or Nurse***

PRINT NAME _____

Hospital/Clinic Address of physician or nurse verifying this information:

_____

_____

Telephone number of hospital/clinic_____

Immunization Compliance Policy

It is the policy of the Sanford School of Medicine of The University of South Dakota that all Medical Students must comply with the immunization requirements of the School as defined in the SSOM INFECTIOUS DISEASE MANUAL in a timely manner. This includes appropriate documentation of immunization or titers for Measles (Rubeola) and Rubella prior to registration for those students born after January 1, 1957 as mandated by the Board of Regents and the State Health Department in addition to documentation of immunizations and/or titers required by the School of Medicine. **It is the student's responsibility to meet these requirements in a timely manner *and provide appropriate documentation*.**

Deadline	Immunization/Titer	Documentation Required
Matriculation	MMR (2 doses)	2 doses
	DTP; TD	Childhood vaccination dates *and* TD or tetanus booster within past 10 years.
	Polio	Childhood vaccination dates.
	Varicella Zoster (Chicken Pox)	Immunity may be provided by one of two ways: 1.) Varicella titer indicating immunity (copy of titer report must be provided). ***OR*** 2.) Two doses are recommended (CDC MMWR Jan. 2007) at an interval of 4-8 weeks for people ≥13 years of age without evidence of immunity.
	Hepatitis B	Documentation of *at least* the first 2 doses. (Recommended schedule 0, 1, and 6 months.)
	Hepatitis B Titer (antibody to hepatitis B surface antigen – HbsAB)	Recommended 4-8 weeks following third dose of the immunization series. However, students admitted with prior vaccination history must also provide immune status documentation (hepatitis B titer report), if that is not available the student must have a titer drawn and furnish a copy of the report to USDSM Student Affairs.
January 1st of year one	Hepatitis B immunization series must be completed.	
March 1st of year one	Hepatitis B titer (if series was not completed prior to matriculation).	
Annual	TB skin testing	Provided by USDSM.
Annual	Influenza vaccine	Provided by USDSM or reimbursement to student (up to $15 for their expense).

Failure to comply with any of these deadlines may preclude registration for classes and placement into a clinical setting, and may also result in referral of the non-compliant student to the Student Progress and Conduct Committee for review. Consideration of a deadline extension will be given to those students under special circumstances on a case-by-case basis (i.e. late acceptance, those with a negative Hepatitis B titer that require additional immunizations, etc.).

All transfer students must comply with all requirements prior to matriculation at SSOM.