

RISK ASSESSMENT AND RISK MANAGEMENT

There are numerous well defined risks for the transmission of communicable diseases to patients, to staff, or to the community during the provision of health care. Generally the risk of acquiring an infection during delivery of health care increases among patients who are critically ill and who are subjected to invasive procedures.

Risk assessment/management is an essential tool that is used by the Infection Control team to assess and to evaluate situations or care being delivered, to minimize these risks by implementing appropriate interventions, and to provide high quality health care. Risk assessment and other tools such as application of epidemiological methods are proactive rather than reactive. RM is concerned with developing the expertise of individuals within the organization to minimize risk and to “reduce loss.”par

Risk Assessment (RA)

RA is an essential activity that needs to be done before developing an IC program. The assessment should include a study of the patient population, staffing (types and levels), and the clinical practices and their attendant risks as well as a study of administrative needs necessary to minimize these risks. The RA should include a review of the community from which the patients come, identifying as much as possible the likely types and volume of communicable diseases prevalent in the local area, and the intensity/complexity of services being provided. The assessment should review existing policies to address the availability of critical supplies and infrastructure to ensure the safety of high-risk

procedures. The RA should be based on scientific facts. Once the RA profile has been determined, a plan of action should be established. Initial action steps include developing and communicating IC policies in language that is simple and easy to understand. It is often helpful to use graphic illustrations that are displayed in the work area to reinforce infection control policies.

Steps for Risk Assessment

- ✦ Assess critical activities where transmission of infectious agents can occur.
 - ✦ Consider all the available evidence and facts regarding these activities and preventive measures that can be taken through infection control,
 - ✦ Recognize the necessary interventions to stop or to reduce transmission of infectious diseases.
 - ✦ Develop guidelines or policies to minimize likelihood of disease transmission.
- The precautions should be workable and simple.

Examples of Risk Assessment and Management

Procedure - Setting up an IV line

- ✦ Risk Assessment – Staff contact with patient blood (potential risk for exposure). Patient may be infected if health care worker uses non-sterile equipment or poor aseptic technique.
- ✦ Risk Management – Reduce risk to staff by wearing gloves and washing hands. Reduce risk to patient through the use of aseptic techniques and sterile equipment when inserting IV.

Procedure - Taking blood pressure

- ✦ Risk Assessment – No risk, since procedure is non invasive.
- ✦ Risk Management - No need to reduce risk, protective clothing not advised.

Procedure - Cleaning the ward floor

- ✦ Risk Assessment – No risk since staff not in contact with patient.
- ✦ Risk Management - No need to reduce infectious risk, additional protective clothing not advised; standard equipment adequate for staff. Emphasize use of PPE to protect against exposure of staff to chemicals that might be in cleaning materials.

Procedure - Cleaning the toilet area or handling bedpans

- ✦ Risk Assessment – Exposure to fecal pathogens during cleaning.
- ✦ Risk Management - Reduce risk, by wearing gloves and washing hands.

Management of needle stick injuries

1. Immediately following an exposure to blood or body fluids with visible blood:
Wash needle sticks/sharps injury site and cuts with soap and water.
Irrigate eyes with clean water, saline, or sterile irrigates. There is no scientific evidence that using antiseptics prevents infection or that by squeezing the injured site can remove contaminants. Prevention of occupational sharps injuries among personnel is an important component of the Infection Control program. Personnel in Pakistan are at risk of occupational exposure to bloodborne pathogens during the course of their duties. A Sharp Injury Prevention Program therefore should be developed that balances availability of resources and devices with care activities that have been identified as placing personnel at risk. For example, there is evidence that inappropriate

sharps disposal containers or the absence of puncture-resistant sharps disposal containers place waste disposal personnel at risk of exposure. An intervention to reduce this risk could include implementation of puncture-resistant containers for disposal of contaminated sharps. One of these studies identified use of cardboard shipping containers being converted to use as sharps containers. This material is not puncture resistant. Instead alternatives such as empty containers previously used for bleach could be thoroughly rinsed and distributed to points throughout the facility where sharps are being generated. The cap would need to be attached to the container to assure it could be sealed once $\frac{3}{4}$ full. The circumstances leading to a needle stick injury depend partly on the type and design of the device used. For example, needle devices that must be taken apart or manipulated after use (e.g., pre filled cartridge syringes and phlebotomy needle) are an obvious hazard and have been associated with increased injury rates. In addition, needles attached to a length of flexible tubing (e.g., winged steel needles and needles attached to IV tubing) are sometimes difficult to place in sharps containers and thus present another injury hazard. Injuries involving needles attached to IV tubing may occur when health care personnel insert or withdraw a needle from an IV port or tries to temporarily remove the needle stick hazard by inserting the needle into a drip chamber, IV port or bag, or even bedding. In addition to risks related to device characteristics, needle stick injuries have been related to certain work practices such as: Re-capping. Transferring a body fluid between containers. Failing to properly dispose of used needles in puncture-resistant sharps containers.

Monitoring Injuries among Health Care Personnel

One of the most important ways that infection control programs can help maintain the safety of the facility environment is by reporting incidents and by monitoring disease occurrences that have the potential for disseminating infections to staff

or to patients. All injuries or conditions that predispose HCP to injuries should be reported to the infection control program including:

Needle stick and sharps injuries;

✦ Report to an Infection Control Team.

✦ Procedures should describe where the injured Health Care Worker should seek initial assessment and counseling for follow-up testing and appropriate treatment.

✦ The occupational safety program should provide post-exposure prophylaxis based on the hepatitis B vaccination status of the HCP and on the serology status of the source patient.

Conditions that exist in the facility that increase the risk of disease transmission such as a shortage of needles for injections (which may increase likelihood of re-use);

Shortage of sharps boxes and hazardous waste containers.

Conditions that exist in the facility that increase the risk of injury to the community at large such as improper disposal of waste.

Based upon the analysis of these reports, the infection control team should implement appropriate measures to minimize the risk to the clinician, to fellow staff, to patients, to visitors, and to the community at large.

Table 3.2 Recommended post-exposure prophylaxis for exposure to HBV.

Vaccination and anti-body response status of exposed workers	Treatment		
	Source HBsAg [†] positive	Source HBsAg [†] Negative	Source unknown or not available for testing
Unvaccinated	HBIG ^S X 1 and initiate HB vaccine series [¶]	Initiate HB vaccine series	Initiate HB vaccine series
Previously vaccinated Known responder ^{**}	No treatment	No treatment	No treatment
Known non-responder ^{††}	HBIG X 1 and initiate revaccination or HBIG X 2 ^{SS}	No treatment	If known high-risk source, treat as if source were HBsAg positive
Antibody response unknown	Test exposed person for anti-HBs ^{¶¶}	No treatment	Test exposed person for anti-HBs
	1. If adequate, ^{**} no treatment is necessary		1. If adequate, [¶] no treatment is necessary
	2. If inadequate, ^{††} administer HBIG X 1 and vaccine booster		2. If inadequate ^{¶¶} administer vaccine booster and recheck titre in 1-2 months

[¶]Persons who have previously been infected with HBV are immune to reinfection and do not require post-exposure prophylaxis.

[†]HBsAg: hepatitis B surface antigen.

^SHBIG: Hepatitis B immunoglobulin; dose is 0.06 ml/kg intramuscularly.

[¶]Hepatitis B (HB) vaccine.

^{¶¶}A responder is a person with adequate levels of serum antibody to HBsAg, i.e. anti-HBs \geq 10mIU/ml.

^{††}A non-responder is a person with inadequate response to vaccination, i.e. serum anti-HBs < 10mIU/ml.

^{SS}The Option of giving one dose of HBIG and reinitiating the vaccine series is preferred for non-responders who have not completed a second 3-dose vaccine series. For persons who previously completed a second vaccine series but failed to respond, two doses of HBIG are preferred.

^{**}anti-HBs: Antibody to HBsAg.

Reproduced from CDC Guidelines for the management of occupational exposures to HBV, HCV, and recommendations for post-exposure prophylaxis. Morbidity and Mortality Weekly Report 2001; 50 (RR-11): 1-42.

Table 3.3 Post-exposure prophylaxis against infectious disease.

Disease	Prophylaxis	Indications	Comments
Hepatitis A	One IM dose normal immunoglobulin given within 3 weeks of exposure.	HCW exposed to faeces of infected persons during outbreaks.	Persons with IgA deficiency, if administered within 2 weeks after MMR (Measles-Mumps-Rubella) or within 3 weeks after varicella vaccine then the immune response to these vaccines is likely to be inadequate.
Hepatitis B	Table 3.2	HCW exposed to blood or body fluids containing HBsAg and who are not immune to HBV infection.	
Hepatitis C	Contact ICT for current recommendations		
HIV infection	Table 3.1		
Varicella zoster	Varicella zoster immunoglobulin	HCW known or likely to be susceptible (especially those at high risk for complication, e.g. pregnant women) who have close and prolonged exposure to a contact case or an infectious HCW/patients.	
Diphtheria	Benzathine penicillin 1.2 megaunit IM single dose or erythromycin 1 g per day Orally for 7 days.	HCW exposed to diphtheria or identified as carrier.	

Table 3.3 Continued

Disease	Prophylaxis	Indications	Comments
Meningococcal disease	Rifampicin 600 mg orally every 12 h for 2 days, or Ceftriaxone 250 mg IM single dose or Ciprofloxacin 500 mg orally single dose.	HCW with direct contact with respiratory secretions from infected persons without the use of proper precautions, e.g. mouth-to-mouth resuscitation, endotracheal intubation, endotracheal management, or close examination of oropharynx.	
Pertussis	Erythromycin 500 mg 6 hourly orally for 14 days after exposure.	HCW with direct contact with respiratory secretions or large aerosol droplets from respiratory tract of infected persons.	

Table 3.4 Summary of suggested work restrictions for HCWs exposed to or infected with infectious diseases.

Disease	Work restrictions	Duration
Conjunctivitis	Restrict from patient contact and contact with patient's environment.	Until discharge ceases.
Cytomegalovirus infection	No restriction.	
Diarrhoeal diseases Acute stage	Restrict from patient contact contact with patient's environment, and food handling.	Until symptoms resolve.
Convalescent stage (<i>Salmonella</i> spp.)	Restrict from care of high-risk patients.	Until symptoms resolve; refer to local guidelines regarding need for negative stool culture.
Diphtheria	Exclude from duty.	Until antimicrobial therapy completed and two cultures obtained > 24h apart are negative.
Enteroviral infections	Restrict from care of infants, neonates or immunocompromised patients and their environments.	Until symptoms resolve.
Hepatitis A	Restrict from patient contact, contact with patients' environment, and food handling.	Until 7 days after onset of jaundice.
Hepatitis B HCW with acute or chronic hepatitis B (HBsAg positive) who does not perform exposure-prone procedures.	No restriction; standard precaution should always be observed.	
HCW with acute or chronic hepatitis B (HBsAg positive) who perform exposure-prone procedures.	Do not perform exposure-prone invasive procedures. Seek advice from Occupational Health Department who will review and recommend procedures	
Hepatitis C	Do not perform exposure-prone invasive procedures. Seek advice from Occupational Health Department who will review and recommend procedures.	
Herpes simplex Genital	No restriction.	
Hands (herpetic whitlow)	Restrict from patient contact and contact with patient's environment.	Until lesions heal.
Orofacial	Evaluate for need to restrict from care of high-risk patients.	

Table 3.4 Continued

Disease	Work restrictions	Duration
HIV infection	Do not perform exposure-prone invasive procedures. Seek advice from Occupational Health Department who will review and recommend procedures	
Measles Active	Exclude from duty.	Until 7 days after the rash appears.
Post-exposure (susceptible HCW)	Exclude from duty.	From 5th day after first exposure through 21st day after last exposure and/or 4 days after rash appears.
Mumps Active	Exclude from duty.	Until 9 days after onset of parotitis.
Post-exposure (susceptible HCW)	Exclude From Duty.	From 12th day after first exposure through 26th day after last exposure or until 9 days after onset of parotitis.
Pediculosis	Restrict from patient contact.	Until treated and observed to be free of adult and immature lice.
Pertussis Active	Exclude from duty.	From beginning of catarrhal stage through 3rd week after onset of paroxysms or until 5 days after start of effective antibiotic therapy.
Post-exposure (asymptomatic HCW)	No restriction, prophylaxis recommended	
Post-exposure (symptomatic HCW)	Exclude from duty.	Until 5 days after start of effective antibiotic therapy.
Rubella Active	Exclude from duty.	Until 5 days after rash appears.
Post-exposure (susceptible HCW)	Exclude from duty.	From 7th day after first exposure through 21 st day after last exposure.
Scabies	Restrict from patients contact.	Until cleared by medical evaluation.
<i>Staphylococcus aureus</i> infection Active, draining skin lesions	Restrict from patient contact, contact with patient's environment, and food handling.	

Table 3.4 Continued

Disease	Work restrictions	Duration
Carrier state	No restriction, unless HCW is epidemiologically linked to transmission of the organism,	
Streptococcal infection, group A (<i>Strep. Pyogenes</i>)	Restrict from patient contact, contact with patients' environment, and food handling.	Until 24h after antibiotic therapy.
Tuberculosis Active	Exclude from duty.	Until proven non infectious
PPD converter	No. restriction.	
Varicella Active	Exclude from duty.	Until all lesions dry and crust.
Post-exposure (susceptible HCW)	Exclude from duty.	From 10 th day after first exposure through 21 st day (28th day if VZIG given) after last exposure.
Zoster Localized in healthy person	Cover lesions, restrict from care of high-risk patients	Until all lesions sry and crust.
Generalized or locatized in immunosuppressed person	Restrict from patient contact.	Until all lesions dry and crust.
Post-exposure (susceptible HCW)	Restrict from patient contact.	From 8th day after frist exposure through 21st day (28th day if VZIG given) after last exposure or, if varicella occure, until all lesions dry and crust.
Viral respiratory infections, acute febrile	Consider excluding from the care of high-risk patients or contact with their environment during community outbreak of RSV and influenza.	Until acute symptoms resolve.

HBsAg: Hepatitis B surface antigen; HIV: human immunodeficiency virus; VZIG: varicella zoster immunoglobulin; RSV: respiratory syncytical virus.

*Those susceptible to varicella or at increased risk of complication of varicella, e.g. neonates and immunocompromised persons

Modified from Bolyard EA, Trablou OC, Williams WN, et al. CDC Guideline for infection control in healthcare personnel, 1998. *American Journal of Infection Control* 1998; 26 (3): 289-354.