Chapter 16
Occupational Health Risks for Healthcare Workers

Patricia Lynch with Liz Bryce and Eva Thomas

Key points

- Assess infection risks to personnel and prioritise preventive measures.
- Implement an education programme about safety and infection prevention related to the specific risks of work in the facility.
- Determine susceptibility to vaccine preventable diseases and implement an appropriate immunisation programme.
- Conduct exposure investigations including review of post-exposure management.
- Implement surveillance of occupational blood exposures and develop prevention strategies for high-risk practices or departments.

Introduction

Healthcare workers are at risk of exposure to a variety of infectious agents which may cause them illness and which they may transmit to other staff and patients. Occupational Health Departments (OHD) that work closely with the infection prevention and control department may minimise this risk by maintaining necessary records, performing screening and immunisations, educating staff about risk and prevention, and conducting exposure management and investigations.

Table 16.1 presents a list of healthcare-associated infections in patients and employees in health care settings. Local infection control teams (ICT) and OHDs must review this list, determine potential risks, and prioritise the allocation of resources for risk reduction in their facility. The routes of transmission of each microorganism must be understood before appropriate prevention measures can be selected.

Prevention of infection: General measures

- Maintain easily retrievable occupational health records.
- Screen new employees for a history of communicable diseases. Immunise for vaccine preventable diseases.
- Record needlestick and other injuries in an 'accident' log; data on the epidemiology of blood exposures should be analysed periodically to audit practices and identify preventable risks.
- Provide evaluation and guide work restrictions for staff with infectious diseases or exposures.
- Ensure that all staff members cover lesions on exposed skin with a waterproof dressing.

Minimal Requirements for Personnel and Patient Protection

Preventing the spread of infection often requires us to 'break the chain of infection', i.e., to interrupt the normal routes of transmission. The following measures are targeted at specific methods of spread.

Contact

- Wash hands when they are likely to have been soiled and before beginning care for a new patient. Alcohol hand rubs are acceptable unless hands are visibly soiled.
- For contact with all mucosa and broken skin, wear gloves that are clean at the time of use. Use sterile gloves for normally sterile body sites.
- Wear appropriate barriers for a task, e.g., eyewear for spatter and appropriate gloves for contact with all moist body substances.
- Disinfect all items between patients.
- Handle all clinical specimens as if known to be infectious.
- Handle soiled linen and trash so as to avoid skin contact.

Airborne

Restricting susceptible staff from exposure is the best and often the only prevention strategy for diseases transmitted in whole or in part by air. Common surgical masks provide minimal protection. High efficiency, respirator type masks may offer some protection when in close contact with a coughing patient with tuberculosis. However, they are expensive and often not available. It is not clear if they are useful to protect susceptible staff from measles or varicella virus.

Post Exposure Prevention

Once exposure to a communicable disease has been identified, the ICT must try to prevent spread of the pathogen. To begin with, they must identify and list those individuals who have been significantly exposed, using definitions which must be clearly listed in the infection prevention and control manual. The next step is to determine which exposed persons need intervention. Individuals immune either from previous natural infection or vaccination must be identified. The OHD should keep a register of each staff member's immune status.

Limiting Exposures

The key to limiting exposures in a healthcare institution is developing policies and procedures that:

- consistently identify individuals at high-risk for communicable diseases;

Table 16.1. Risks for transmission of infectious agents in health care settings and risk reduction strategies for employee to patient and patient to employee transmission

Infection	Modes of Transmission	Estimated transmission risk to a susceptible host		Primary risk reduction strategies
		Staff to patient	Patient to staff	
Chickenpox, disseminated zoster	Contact with vesicles; droplet or airborne spread from respiratory tract of acute cases and perhaps from disseminated zoster.	High	High	Varicella vaccine for susceptible individuals; varicella zoster immune globulin (VZIG) for immunocompromised contacts of cases. Major risk: adults and immunocompromised hosts; bone marrow transplant patients at greatest risk.
Localized varicella-zoster (shingles)		Moderate	Moderate	
Conjunctivitis, viral (e.g., adenovirus)	Contact with eye secretions and contaminated objects.	High	High	Identify and eliminate environmental reservoirs; restrict infected personnel; emphasise hand hygiene and disinfection of shared ophthalmic equipment.

Infection	Modes of Transmission	Estimated transmission risk to a susceptible host		Primary risk reduction strategies
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Cytomegalovirus (CMV)	Contact with urine, saliva, breast milk, cervical secretions, and semen from infected person who is actively shedding virus.	Rare	Rare	Use care in handling diapers and oral secretions. Appropriate gloves and hand hygiene. CMV is very common in young children, organ-transplant patients, and patients with HIV/AIDS; undiagnosed cases are far more common than diagnosed cases.
Hemorrhagic fever (Ebola & Marburg virus)	Bloodborne; some question of contact transmission.	Low	Moderate (risk from puncture unknown)	Bloodborne disease precautions: safe handling of needles and sharps; use gloves, other barriers including protective eyewear, and hand hygiene appropriately.
Hepatitis A	Person-to-person by faecal-oral route; rarely via blood transfusion; infected food handlers with poor personal hygiene can contaminate food.	Rare	Rare	Use care in handling diapers and faecal materials; use gloves and hand hygiene appropriately; use immune serum globulin prophylaxis for significant exposures; provide hepatitis A vaccine, when appropriate. Hospital outbreaks almost always from an unrecognised case.

Infection	Modes of Transmission	Estimated transmission risk to a susceptible host		Primary risk reduction strategies
		Staff to patient	Patient to staff	
Hepatitis B virus	Via percutaneous, mucosal, and nonintact skin contact with blood, semen, vaginal secretions, and bloody fluids.	Low	Moderate (risk from puncture: 6-35%)	Hepatitis B vaccine for all personnel at risk for blood exposure; emphasise safe handling of needles and sharps; use gloves, other barriers, and hand hygiene appropriately; use high titre hepatitis B immune globulin (HBIG) prophylaxis for significant exposures in susceptible personnel.
Hepatitis C virus	Same as for Hepatitis B.	Rare	Low (risk from puncture: 1-7%)	Emphasise safe handling of needles and sharps; use gloves, other barriers, and hand hygiene appropriately.
Herpes simplex	Contact with virus in saliva of carriers; contact with vesicle fluid.	Rare	Low	To protect personnel, use gloves for contact with oral secretions, mouth care and vesicles; to protect patients, employee should cover lesion with dressing or wear gloves with herpetic whitlow. May need to restrict infected staff from patient contact.

Infection	Modes of Transmission	Estimated transmission risk to a susceptible host		Primary risk reduction strategies
		Staff to patient	Patient to staff	
Human immunodeficiency virus (HIV)	Primarily via percutaneous contact with blood; mucosal or nonintact skin contact with blood. Semen, vaginal secretions, and bloody body fluids less likely to transmit.	Very rare	Rare (risk from puncture: 0.03%)	Emphasise safe handling of needles and sharps; use gloves, other barriers, and hand hygiene appropriately. Manage post-exposure prophylaxis in accordance with current guidelines. Healthcare workers who know or suspect themselves to be HIV or Hepatitis B e-antigen positive should seek advice; it may not be appropriate to perform exposure-prone procedures
Influenza	Airborne; direct or droplet contact with respiratory secretions.	Moderate	Moderate	Influenza vaccine for high-risk employees and patients; amantadine or other prophylaxis for influenza A exposures, as appropriate.
Measles	Airborne; direct or droplet contact with nasal or throat secretions of infected person.	High	High	Natural immunity or measles vaccine for health care personnel; vaccine for patients, as appropriate. Measles outbreaks have been reported in poorly-ventilated medical offices; many health care facilities require measles immunity as a condition of employment.

Infection	Modes of Transmission	Estimated transmission risk to a susceptible host		Primary risk reduction strategies
		Staff to patient	Patient to staff	
Meningococcal infection	Direct contact with oral secretions.	None reported	Rare	Appropriate use of gloves and hand hygiene; antibiotic prophylaxis indicated only for personnel with mucosal contact with oral secretions (e.g., performing mouth-to-mouth resuscitation).
Mumps	Droplet contact or direct contact with oral secretions.	Moderate	Moderate	Mumps vaccine is effective for personnel and patients; adults may have complications.
Pertussis	Droplet contact or direct contact with respiratory secretions.	Moderate	Moderate	Appropriate use of gloves, other barriers, and hand hygiene; antibiotic prophylaxis of exposed health care workers; hospital outbreaks reported.
Respiratory syncytial virus	Droplet contact or direct contact with respiratory secretions.	Moderate	Moderate	Appropriate use of gloves, other barriers, and hand hygiene; eye protection may reduce risk of self-inoculation via contaminated hands.
Rotavirus	Person-to-person via faecal-oral route.	Moderate	Moderate	Appropriate use of gloves, other barriers, and hand hygiene; many outbreaks have been reported in adult and child units.

Infection	Modes of Transmission	Estimated transmission risk to a susceptible host		Primary risk reduction strategies
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Rubella	Droplet contact or direct contact with respiratory secretions: airborne transmission not demonstrated.	Moderate	Moderate	Natural immunity or rubella vaccine for health care personnel and vaccine for patients, as appropriate. Many health care facilities require employees to be immune to rubella.
Salmonella or Shigella	Person-to-person via faecal-oral route; via contaminated food or water; food handlers with poor personal hygiene can contaminate food.	Low	Low	Hand hygiene, especially after using the toilet and before preparing food; appropriate use of gloves and hand hygiene when caring for incontinent patients. Shigella only requires a very small inoculum (10 - 100 microorganisms) and is easy to transmit; Salmonella (except typhoid) requires larger inoculum and is common in eggs and poultry.
Scabies	Direct skin-to-skin contact with infested person.	Low	Low	Index of suspicion for scabies with any undiagnosed rash; use of acaricide (such as lindane or permethrin) promptly to eradicate infestation; gloves, other barriers, and hand hygiene. Outbreaks have often involved patients, personnel and household contacts.

Infection	Modes of Transmission	Estimated transmission risk to a susceptible host		Primary risk reduction strategies
		Staff to patient	Patient to staff	
Staphylococcus aureus (includes wound and skin infection)	Direct and indirect contact.	Rare	No data	Appropriate use of gloves, other barriers and hand hygiene. *S. aureus* intermittently colonises normal human skin and the nares of 2 - 30% of the population. Transmission from patient to patient common. Treatment to eradicate colonisation is controversial., but mupirocin has been recommended for nasal carriage.
Streptococcus, Group A	Droplet contact or direct contact with oral secretions or drainage from infected wounds.	Rare	No data	Appropriate use of gloves, other barriers and hand hygiene; antibiotic treatment for symptomatic persons or those identified as shedders.
Syphilis	Direct contact with lesions of primary or secondary syphilis.	No data	Rare	Appropriate use of gloves when touching any lesions; other barriers as appropriate; hand hygiene.
Tuberculosis (TB)	Airborne transmission from sources with active pulmonary or laryngeal tuberculosis; susceptible person must inhale airborne droplet nuclei to become infected.	Low to high	Low to high	Index of suspicion for a TB case; appropriate ventilation of locations where TB patients receive care; airborne precautions for identified cases; respiratory protection for personnel. Exposure management and treatment of individuals with new infections.

- employ dependable and easily implemented methods to limit the exposure at the source (i.e., the patient);
- are based on symptoms rather than diagnosis;
- are readily communicated and understood;
- protect staff, other patients and visitors.

Support

Infection prevention and control activities require a mandate from administration for exposure management in conjunction with the OHD. This mandate must define responsibility, lines of communication, and authority.[1] Policies and procedures should be developed that cover workload, finances, medico-legal issues (including sick leave with or without pay), immunisations and confidentiality.

References and Further Reading

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