

Infection prevention and control for viral infections

RUTH LEKALAKALA, BSc, MB ChB, DTME&H, MMed (Medical Microbiology), PDIC

Consultant Medical Microbiologist, Principal Pathologist and Senior Lecturer, Department of Medical Microbiology, Faculty of Health Sciences, University of Pretoria and Tshwane Academic Division, National Health Laboratory Service (NHLS)

Correspondence to: Ruth Lekalakala (ruth.lekalakala@up.ac.za)

Infection prevention and control (IPC) is the new terminology used for what was previously referred to as simply ‘infection control’. It is an important component of health care and all health care workers (doctors, nurses, allied health workers, etc.) need to know at least the essential principles of infection prevention and control,^{1,2} as this will equip them with the knowledge and skills needed to provide safe and effective health care.

More about

There are two main components of IPC, namely the standard precautions (previously referred to as universal precautions) which should be applied to all patients, and transmission-based precautions which are often used empirically, according to the clinical syndrome and the likely aetiological pathogen.

Furthermore, in order to do risk assessment and implement IPC measures one needs to have an understanding of the chain of infection (Fig. 1).¹ This includes knowledge of the size of the inoculum of the causative micro-organism, virulence of the pathogen, route of transmission and entry into susceptible host. This valuable information is not always readily available, hence the need to adhere to standard precautions, of which hand hygiene is the most important. The principles of IPC are outlined in Table I.¹

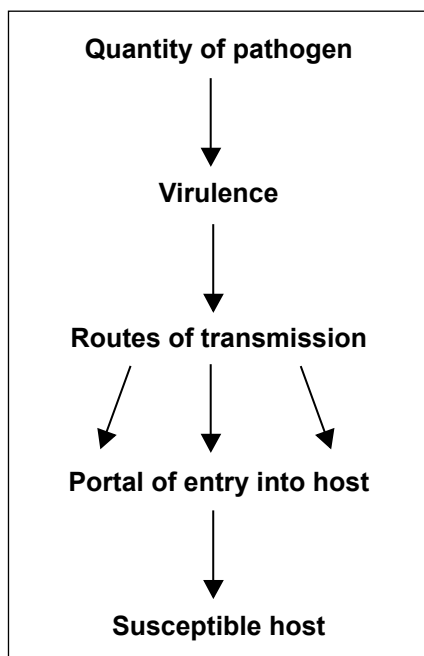


Fig. 1. Chain of infection from WHO influenza training package.¹

Table I. The principles of infection prevention and control^{1,2}

- Early recognition and reporting
- Infection control precautions
- Hand hygiene: alcohol-based hand rub, hand washing
- PPE: gloves, gowns, masks/respirators, eye protection
- Patient accommodation
- Environmental cleaning and waste disposal
- Occupational health management

Respiratory viruses

Influenza and other respiratory viruses cause substantial morbidity among children and

high-risk adult groups. Annual vaccination against influenza plays an important role in the prevention of circulating strains. However, for people with respiratory infections the following transmission-based precautions are recommended:^{1,2}

- Droplet precautions for protection against respiratory pathogens transmitted by large droplets:
 - use a medical mask when <1 m from patient
 - maintain a distance >1 m from infectious patient
 - place patient in a single room or cohort with similar patients
 - limit patient movement.
- Airborne precautions for protection against inhalation of tiny infectious droplet nuclei:
 - use particulate respirator (e.g. N95 mask)
 - place the patient in adequately ventilated room (≥ 12 air changes per min)
 - limit patient movement.

Airborne precautions should be adhered to when performing any aerosol-generating procedure.

Blood-borne viruses

Blood-borne viral infections are transmitted by needle-stick injury (NSI), from mother to child and by use of blood and blood products. NSI are mainly due to unsafe practices, which are easily preventable.³ Theoretically any infectious agents that may be present in sufficient quantity in the blood may be transmitted through NSI, but in practice the most commonly reported infections are hepatitis B, HIV and hepatitis C.³

Injuries usually arise when personnel come into contact with sharps that have not been properly disposed of or accidents occurring in the operating theatres during handling of surgical equipment. Safe practices should be strictly followed and every health care worker vaccinated against hepatitis B.

General infection control measures for prevention of blood-borne infections include:^{4,5}

- applying good basic hygiene practices
- covering existing wounds or skin lesions with waterproof dressings
- avoiding invasive procedures, if suffering from chronic skin lesions on hands
- avoiding contamination by appropriate use of protective clothing
- protecting mucous membrane of eyes, mouth and nose from blood splashes
- avoiding sharps usage where possible
- instituting safe procedures for handling and disposal of needles, other sharps and appropriate disposal of all contaminated waste
- instituting adequate procedures for sterilisation of surgical instruments and disinfection of contaminated surfaces.

Viral haemorrhagic fever viruses

Viral haemorrhagic fevers (VHFs) are a group of illnesses caused by several distinct families of viruses: arenaviruses, filoviruses, bunyaviruses and flaviviruses. Some of these viruses cause relatively mild illnesses, while others cause severe, life-threatening disease. Most viruses associated with VHFs are primarily zoonotic but some may be transmitted from person to person.⁶

In conjunction with the World Health Organization, the Centers for Disease Control has developed practical, hospital-based guidelines, titled *Infection Control for Viral Haemorrhagic Fevers in the African Health Care Setting*.⁶

For haemorrhagic fever viruses that are transmitted between persons, important IPC measures include:

- avoiding contact with body fluids
- barrier nursing with proper isolation of infected individuals
- wearing adequate protective clothing
- proper disinfection and disposal of instruments used, e.g. needles, thermometers, etc.

Cases of VHF are often first suspected or diagnosed in hospitals or clinics which lack special facilities for isolation of patients. Nevertheless, every effort should be made to isolate the patient and to apply the principles of high security barrier-nursing as soon as a diagnosis of VHF is suspected. The precautionary measures must remain in force until the possibility of VHF has been excluded or the patient has been transferred to a designated secondary hospital for treatment of VHF.

References available at www.cmej.org.za