Prevention of Blood-Borne Virus Infections
Learning Objectives

1. List causes of bloodborne pathogen infections
2. Outline risk reduction measures for healthcare workers
3. Identify methods for reducing risk of bloodborne infections in patients
Time involved

• 40 minutes
Blood-borne Viruses

Main blood-borne viruses transmitted in health care settings:

- Human immunodeficiency virus
- Hepatitis C virus
- Hepatitis B virus
Hepatitis B virus (HBV)

• Found in all body secretions and excretions
• Only blood (and serum-derived fluids), saliva, semen, and vaginal fluids infectious
• May survive on environmental surfaces for more than a week
• Indirect exposure to HBV can occur
• Risk of transmission of HBV is reduced by immunisation
Hepatitis C virus (HCV)

• Primary cause of parenterally transmitted hepatitis
• Transmitted via blood
• No immunisation available
Human immunodeficiency virus (HIV)

- Transmitted via sexual contact, injection drug use, and from mother to neonate
- Percutaneous exposure a more effective means of transmission than mucous membrane exposure
HCW Exposure

Healthcare workers may be exposed to blood-borne infections from:

- Lacerations
- Punctures
- Non-intact skin exposures to the blood or body fluids of infected patients
- Surgical or invasive medical/dental procedures
Blood/Body Fluid Exposure among Healthcare Workers

- Puncture wound
- Skin contact
- Mucous membrane contact
Patient Exposure

Patients may be exposed to blood-borne infections from:

- Improperly sterilised equipment
- Unsterile injection fluids
- Contaminated infusions
- Transplantation
- Blood of infected HCWs during invasive procedures
Healthcare Worker Risk Reduction - 1

- Always use disposable gloves whenever exposure to blood or body fluids likely
- NEVER re-sheath needles
- Containers for sharps disposal should be available within arm’s length
  - When sharp items being used
Healthcare Worker Risk Reduction - 2

- Containers sealed with a tamper proof lid
  - Safely discard when three quarters full
- Standard Precautions must be adopted
- Immunise high-risk HCWs
- Always use available safety devices
Safety Devices: examples

Safety scalpel

Safety hypodermic needle
Safer Needle Devices - 1

• Needleless Connector Systems
  • Needleless connectors for IV delivery systems
Safer Needle Devices - 2

- Self-Sheathing Safety Feature
- Sliding needle shields attached to disposable syringes and vacuum tube holders

Before use

After use
Safer Needle Devices - 3

• Retractable Technology
  • Needles or sharps retract into a syringe, vacuum tube holder or back into the device
Safer Needle Devices - 4

- Self Blunting Technology
  - Self-blunting phlebotomy and winged-steel “butterfly” needles

Blunt-Tipped Blood Drawing Needle

Winged Steel Needles
Safer Needle Devices - 5

- Add-on Safety Features
  - Hinged or sliding shields attached to phlebotomy needles, winged steel needles and blood gas needles
One Handed Technique
Sharps Containers - examples
Sharps Containers
Personal Protective Equipment
Reducing Unnecessary Injections

Educate HCWs, patients, and the public about injection risk by:

- Developing teaching materials about injection risk and importance of reducing injection frequency
- Enlisting influential institutions to campaign against unnecessary injections
  - churches, mosques, universities, hospitals, and government agencies
- When available, teach how to use safety devices and proper disposal of all single use devices
- Eliminate use of unsterile needles, syringes, and solutions for injections
Monitoring

• Surveillance for occupational blood exposures
  • Can provide useful data to focus local prevention efforts
• Routine accident reports may not provide adequate information
  • Focused studies may be required
Strategies to Eliminate Injuries

1. Eliminate or reduce the use of needles and other sharps

2. Use devices with safety features to isolate sharps

3. Use safe practices to minimize risk for hazards
Recommendations for Healthcare Facilities - 1

- Surveillance
- Training personnel
- Personnel immunisation
- Always wash or disinfect hands and surroundings between patients
- Provide appropriate personal protective equipment
  - Always use gloves when contact with body fluids and blood
- Enforce safe practices through monitoring and supervision
- Establish a bloodborne pathogen management policy
Recommendations for Healthcare Facilities - 2

- Implement management policies
  - Exposure reporting, PEP access, etc.
- Establish laboratory capacity for bloodborne virus testing
- Use appropriate PEP regimens
- Provide access to counseling for exposed personnel
- Monitor adverse events and seroconversion
- Monitor exposure management programs
  - Time between exposure and evaluation, testing source persons, completion of follow-up
Multi-Component Prevention Approaches

• Experts agree that safety devices and work practices alone will not prevent all sharps injuries

• Significant declines in sharps injuries also require:
  - Education
  - Reduce invasive procedures (as much as possible)
  - A secure work environment
  - Adequate staff-to-patient ratio
Patient Risk Reduction

- Prevent contact transmission
- Needles and syringes single use
- Single use vials of medications, not multiple use vials
  - To reduce contamination during use
- Equipment cleaned and sterilised between patients
- Single use disposable items used to avoid need for sterilisation/disinfection
  - Single use items must never be reused
- Blood and blood products used for transfusion screened for blood-borne viruses prior to infusion
Summary

• BBV transmission is a recognised risk to healthcare workers and patients

• Transmission of BBVs may occur by contact transmission, injection, infusion, transplantation, unsterile equipment, or other accidental injury/penetration

• Risk can be reduced by
  • preventing contact transmission
  • eliminating hazards
  • providing and using engineering controls
  • avoiding unsafe practices
  • using personal protective equipment
  • immunisation, and
  • post-exposure prophylaxis
References

• World Health Organisation (2010), Geneva, Best practices for injections and related procedures toolkit

• Injection Safety, World Health Organisation, Geneva,
  http://www.who.int/injection_safety/en/

Quiz

1. Replace sharps containers when ¾ full. T/F
2. Use the following practices to decrease exposure to BBVs except
   a. Standard precautions
   b. Immunisation
   c. Sharps containers
   d. Resheathing needles
3. Decrease patient risk of exposure to BBVs by
   a. Use of single dose vials
   b. Screening blood
   c. Cleaning equipment
   d. All of the above
International Federation of Infection Control

- IFIC’s mission is to facilitate international networking in order to improve the prevention and control of healthcare associated infections worldwide. It is an umbrella organisation of societies and associations of healthcare professionals in infection control and related fields across the globe.

- The goal of IFIC is to minimise the risk of infection within healthcare settings through development of a network of infection control organisations for communication, consensus building, education and sharing expertise.

- For more information go to [http://theific.org/](http://theific.org/).