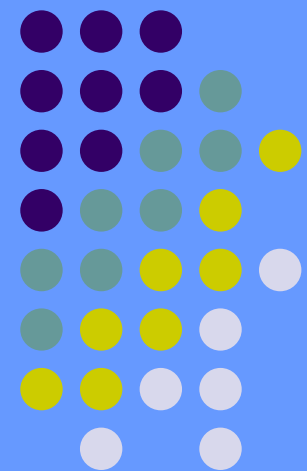


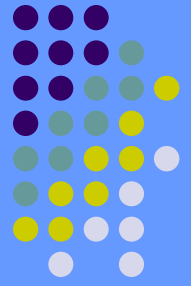
# BASIC CONCEPTS OF INFECTION CONTROL

## Prevention of Blood-Borne Virus Infections

International Federation of  
Infection Control



# Many Pathogens Can Be Transmitted Via BB Exposure



- Bacteria including streptococci, staphylococci, and syphilis
- Viruses including hepatitis, hemorrhagic fevers, HIV, herpes and dengue
- Fungi including blastomyces and cryptococci
- Protozoa including malaria and toxoplasmosis



# Reducing Risk for Patients and Personnel



- Patients

- Using only sterile injection equipment and solutions
- Only using injections when necessary

- Personnel

- Combination of improved barrier precautions, safe sharps practices, post-exposure prophylaxis and immunization for vaccine preventable diseases



# How Important is Risk for BB Virus Infection?



- Major epidemics of hepatitis with many fatalities and chronic disease have occurred among patients and personnel
- Many epidemics from health care BB exposures are never recognized
- Semmelweis died of streptococcal infection from blood exposure



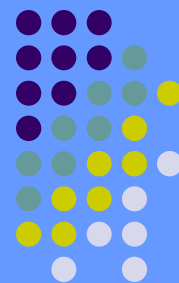
# Is It Better to Reduce Risk for Exposure to Blood or to Prevent Disease After Exposure?



Reducing risk for exposure is easier, cheaper and more effective than reducing risk for disease after exposure



# Safe Injection Global Network (SIGN) Report: *Year 2000 Global Burden of Disease*



- 16 billion injections are performed annually
- Oral meds were often better
- In poverty settings, >half of injections were given with unsterile syringes



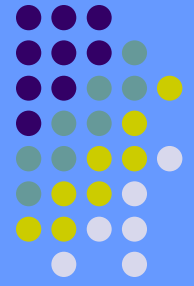
# SIGN Report, Year 2000



- Contaminated Injections Caused
  - 21 million HBV infections
  - 2 million HCV infections
  - 260,000 HIV infections
- Accounting for 32%, 40% and 5% respectively of new infections

Hauri et al. The Global Burden of Disease Attributable to Contaminated Injections Given in Health Care Settings. *Int J STD and AIDS*. 2004; 15:7-16



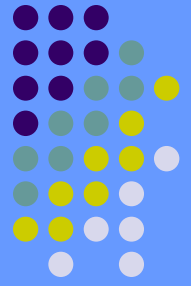


# Why Are Unsterile Syringes Used?

- Cost of sterile injections higher for the provider
- Receivers don't know the risk
- Unsterile injections are tolerated or undetected by those in a position to enforce safer practices
- Risk related to unsterile injections is not viewed as important



# World Health Organization (WHO) Proposal: Develop National Strategies

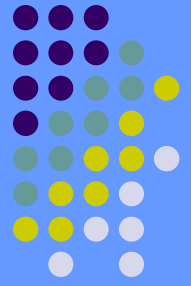


- Create behaviour change among health care workers and patients, provide equipment and supplies and sharps waste management
- Include HIV prevention and care, essential medicines, immunization and health system management.”

World Health Organisation, Geneva, [http://www.who.int/injection\\_safety/en/](http://www.who.int/injection_safety/en/)



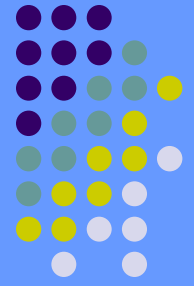
# WHO Proposal



- Integrate these changes in all departments with other activities, including HIV prevention and care, essential medicines, immunization and health system management



# WHO: Reduce Unnecessary Injections



- Develop a policy on appropriate drugs and circumstances for injections and publicize it
- Carry out public campaigns in schools and the media to reduce injections



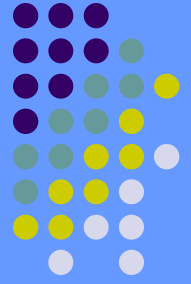
# WHO: Educate HCWS, Patients & the Public About Injection Risk



- Develop teaching materials (posters, lectures) about injection risk and the importance of reducing injection frequency
- Enlist influential institutions such as churches, hospitals, and government officials to campaign against unnecessary injections
- Informed consent



# WHO Recommendations



- Eliminate use of unsterile needles, syringes, and solutions for injections



# Factors that Increase HCW Risk for Blood Exposure



- Risk for exposure was highest when sharp tools were involved, when HCWs were inexperienced at the task, or when the patient was unable to cooperate
- Risk of exposure increases if HCWs anticipated difficulty managing a particular situation

Jackson MM and Lynch P. Development of a numeric Health Care Worker Risk Assessment Scale to evaluate potential for blood-borne pathogen exposures. *Am J Infect Control* 1995;23:13-21

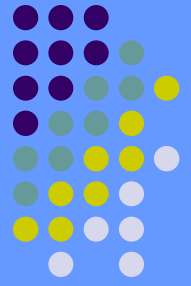


# General Recommendations: Safer Devices



- Select devices that minimize puncture opportunities
- Recognize and prepare for difficult situations, such as drawing blood from agitated or uncooperative patients, children
- Support inexperienced HCWs





# General Recommendations: Safer Practices

- Use barrier precautions to protect HCW mucous membranes and non-intact skin
- Wear gloves when handling sharps -- 1 layer of latex decreases blood penetration from puncture
- Develop a safe waste disposal system
- Actively encourage safety among HCWs



# Specific Recommendations For Barrier Precautions



- Gloves: Sterile gloves for contact with normally sterile tissue
- Clean gloves for likely contact with mucous membranes & nonintact skin
- Recycled or household gloves for contact with moist body substances
- Eye, nose & mouth protection when spatter is likely



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# Recommendations to Reduce Risk for HCWs

- Immunize for HBV all HCWs who are likely to have contact with blood
- Only re-cap disposable needles using a one-handed technique
- Place used sharps in puncture-proof containers before reprocessing or disposal
- Use no-touch techniques (e.g., forceps) to handle blood or contaminated material



# Recommendations to Reduce Risk for Infection After Blood Exposure



- Establish an employee health service (EHS) to manage blood exposures
- Be sure every employee knows where to go immediately after exposure
- Be sure EHS has current recommendations and meds
- Provide prompt prophylaxis and follow-up for HCWs with blood exposures



# Surveillance for Occupational Blood Exposures



- Require reporting of occupational blood exposures so that data can be analyzed to identify the epidemiology of preventable disease and exposures
- Analyze and report the data at useful intervals
- Consider focused studies for high risk departments





# Surveillance of Occupational Blood Exposures

- Passive accident reporting of occupational blood exposures can provide data for prevention efforts
- Accident reports may not provide accurate or sufficient information to guide these prevention strategies; therefore, focused studies may be required



# Reporting Exposure Data Back to High Risk Departments

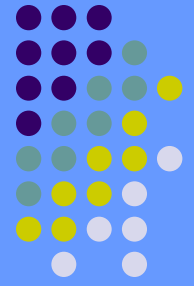


- Studies in departments where the risk for occupational blood exposures is high have shown that personnel were able to reduce the frequency of exposure more than half by changing practices and increasing barrier precautions once they had data from their own departments

White MC, Lynch P. Blood contacts in the OR after hospital-specific data analysis and action. *Am J Infect Control* 1997;25:209-14



# Key Points



- Many pathogens can be transmitted efficiently through blood exposure:
  - Bacteria including streptococci, staphylococci, and syphilis
  - Viruses including hepatitis, hemorrhagic fevers, HIV, herpes and dengue
  - Fungi including blastomyces and cryptococci
  - Protozoa including malaria and toxoplasmosis

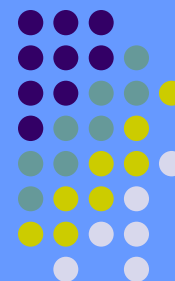


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# Key Points

- Risk for patients is reduced by using only sterile injection equipment and solutions and only using injections when necessary
- Risk for HCWs is reduced through a combination of barrier precautions, safe sharps practices, post-exposure prophylaxis and immunization for vaccine preventable diseases



# References and Further Reading



- Hauri AM, Armstrong GL, Hutin YJF. The Global Burden of Disease Attributable to Contaminated Injections Given in Health Care Settings. *Int J STD and AIDS* 2004;15:7-16
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# References and Further Reading



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- Patterson JE. Isolation of Patients with Communicable Diseases: In: Mayhall CG, editor. *Hospital Epidemiology and Infection Control*, 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2004. p. 1703-1725

