Topics in Infection Control

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key points

- Hand hygiene
- Vaccination
- Isolation measures
- Needle sticks and post exposure prophylaxis
- Environment of care
- Standard precaution
- Hospital acquired infection
  - **Blood stream infection**
  - Catheter associated urinary tract infection
  - Pneumonia
  - Surgical site infection
- Surveillance

Importance of Infection Control Programs

- Healthcare associated infections:
  - In USA: 1.7 million new cases/year
  - Of those: 99,000 die
  - One of top ten causes of death in USA
  - Globally: 1.4 million cases at any given time
  - Developed world: 5-19% hospitalized patients acquire infections
    - More surgical site infections & neonatal infections

Hand hygiene

Hand hygiene

- Let your hand air dry
- Hand lotions for irritated hands
- Wash with soap and water when your hands feel sticky

Hand hygiene

Hand hygiene and gloves

- Wash your hands before and after wearing gloves

Hand hygiene program

- Water & soap
- Alcohol rub
- Skin care

Vaccines for HCW

- HBV
- MMR
- Td
- VZV
- Flu

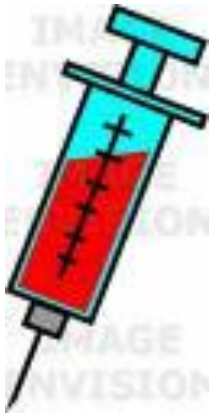
How HIV / HBV are transmitted

1. Sexual contact
2. Sharing needles
3. Mothers to babies
4. A puncture from contact with needle/ glass/ sharp..
5. Contact bet damaged skin and infected bodily fluid and materials
6. Contact bet mucous membrane and infectious bodily fluids and materials

How HIV / HBV are transmitted (cont)

- Damaged skin: cuts, sores, wounds, acne, sunburn, blisters, and abrasions, etc…

- Also mucous membranes
  - Eyes
  - Nose
  - Mouth



eg blood splash into face can enter through eye, nose, mouth

Transmission risk

- HIV 0.3%
- HCV 3%
- HBV 30%

Vaccination

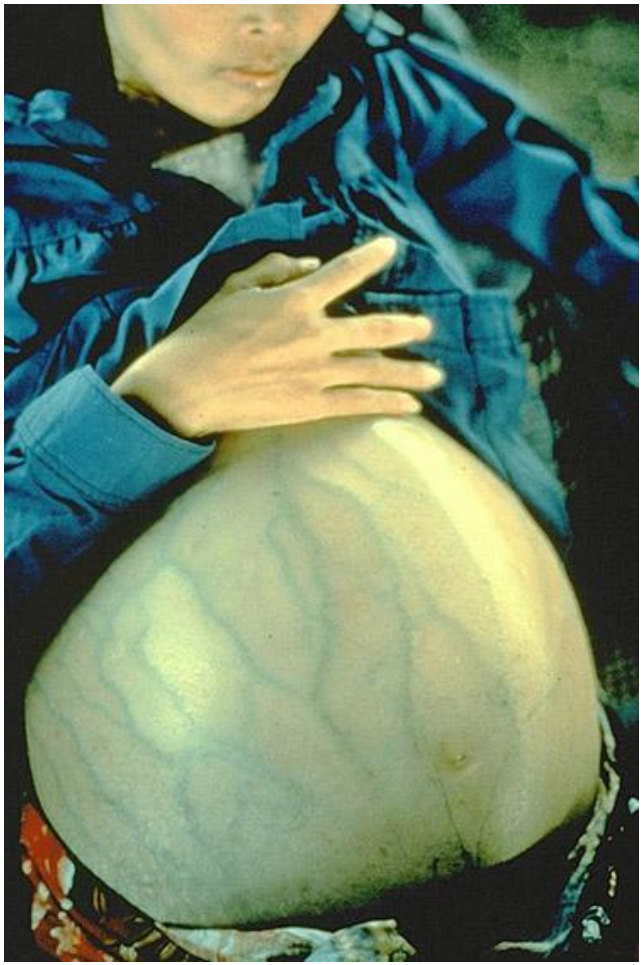
- HBV vaccine
  - 3 doses
  - 0,1,6 months
  - Check titer after 1-2 months from last dose
- HIV, HCV
  - No vaccines

HBV vaccine

- Does not transmit the virus
- The series is administered once
- A booster shot can be given in times of outbreak conditions
- If you are exposed to HBV immediate vaccination is extremely helpful

HBV (cont)

CDC



Isolation

- **Contact** (gowns, gloves, masks)
  - MRSA
- **Respiratory** (negative pressure room, N95 mask)
  - TB, Measles, VZV
- **Droplet** (surgical mask, private room)
  - Meningitis in the first 24hr, non H1N1 influenza
- **Protective** (private room, mask, gown, gloves)
  - Neutropenic pts

Transmission

- Airborne

N95 Mask

Medical / surgical Mask

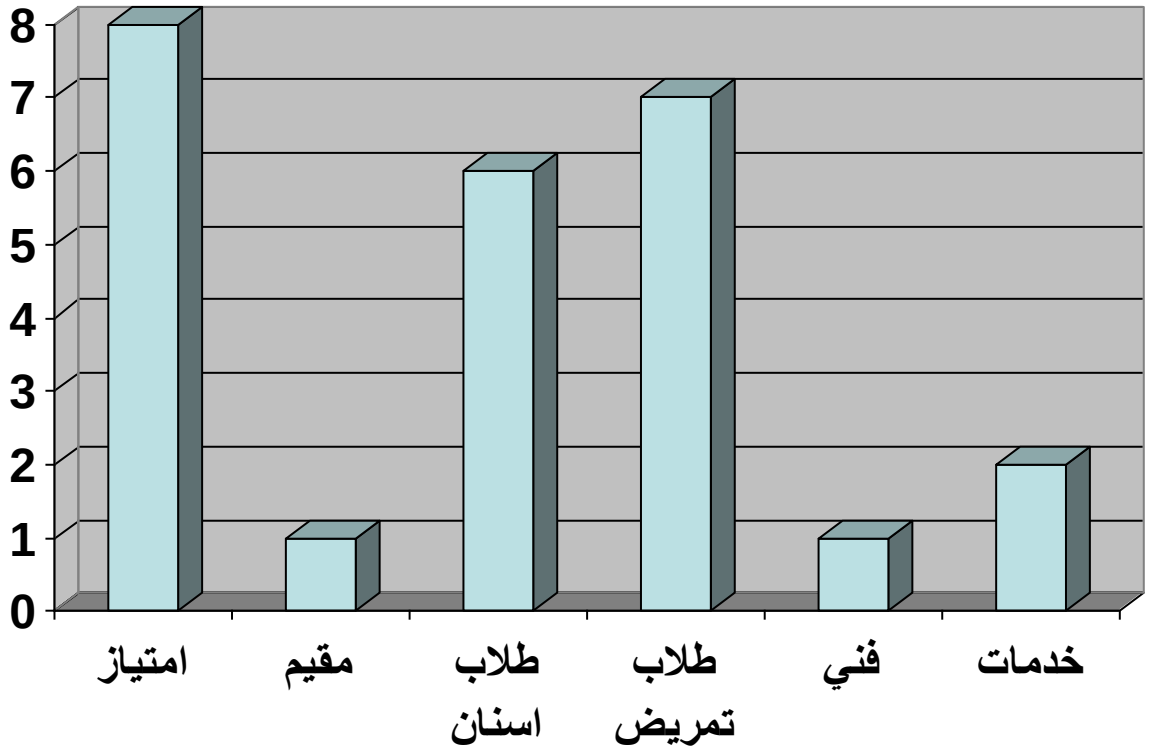
Needles, Needle sticks, and sharps

- Never recap a needle
- Contaminated needles should never be bent, broken
- Contaminated needles should only be disposed in sharps container
- If you need to pick a needle, you can use a tool (forceps …)

Never “ever” recap a needle

- If necessary use single hand technique

Needle stick data (example)



Sharp container

- Closed
- Puncture resistant
- Labeled
- Before moving a sharp container, close the container immediately before removing to prevent spillage or protrusion of contents

Needle sticks

- Baseline:
  - HIV, HCV, HBsAg, HBsAb titer
- If no HBV vaccination and low titers
  - Give HBV vaccine ± HBV Immunoglobulin
- If pt has HIV $\rightarrow$ 3TC + AZT (1 month)
  - Check HIV, HCV, HBV at 1, 3, 6 months
- HCV: no post-exposure prophylaxis

Environment of care

X represents VRE culture positive sites

Contaminated surfaces increase cross-transmission

Abstract: The Risk of Hand and Glove Contamination after Contact with a VRE (+) Patient Environment. Hayden M, ICAAC, 2001, Chicago, IL.

Recovery of MRSA, VRE, C.*diff,* CNS and GNR

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Central line infection pathogenesis

- **Extra-luminal** route: < 10 days
  - Most common mode of infection for non tunneled
  - 4 cm / h by capillary action (Cooper, J Clin Microb, 1988)
- **Intra-luminal** route: > 3 weeks
  - Most common mode of infection for tunneled

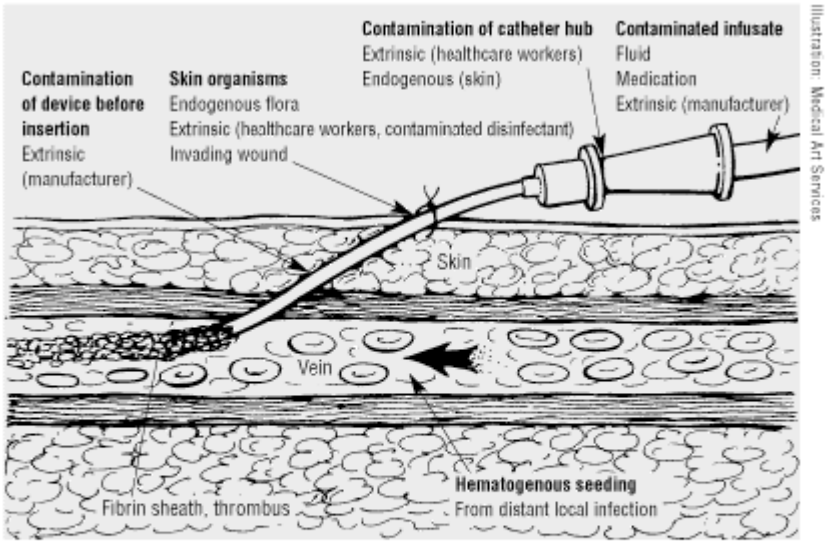


Figure 1. Sources of intravascular catheter–related infection. The chief sources are skin flora, contamination of the catheter hub, contamination of infusate, and hematogenous colonization from a distant site of infection.

Adapted, with permission, from Maki.[1]

Catheter related blood stream infections

-Have high mortality ≈ 25%

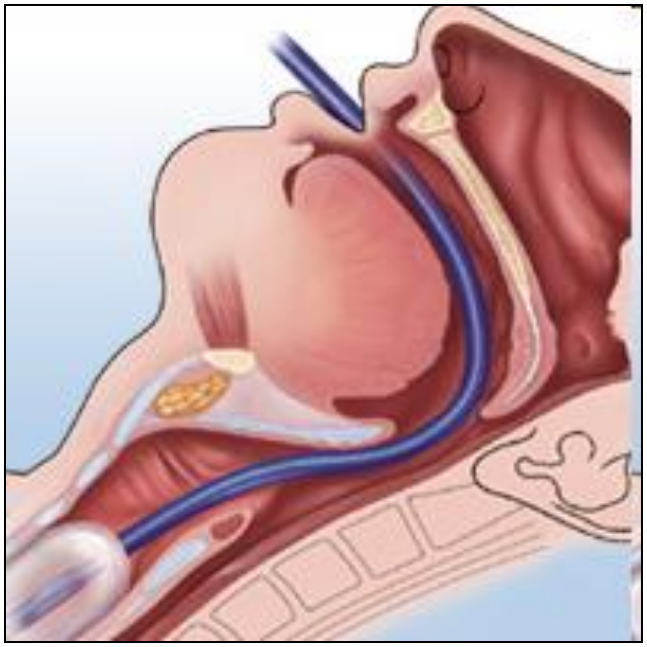
-Use **maximum** sterile precautions for central line insertion

- Head cap
- Mask
- Sterile gown
- Sterile gloves
- Large sterile drape

-Avoid vancomycin prophylactic use

Ventilator-associated pneumonia (VAP)

- Most important risk factor
  - leakage of contaminated subglottic secretions around the cuff of the endotracheal tube



Standard Precautions

- To reduce risk of transmission of unrecognized sources of blood borne and other pathogens in HC institutions

- **Apply to**:
  - Blood
  - All body fluids
  - Secretion and excretions (except sweat), regardless of whether they contain visible blood
  - Non intact skin
  - Mucous membranes

The Steps of Standard Precautions

- Hand hygiene
- Barrier precautions
- Patient placement – taking specific precautions
- Safe handling and disposal of sharps and management of sharps injuries
- Safe handling and disposal of clinical waste
- Safe handling of used linen
- Cleaning of patient care equipment and the environment
- Management of exposure

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