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# INFECTION CONTROL

URC

# Introduction

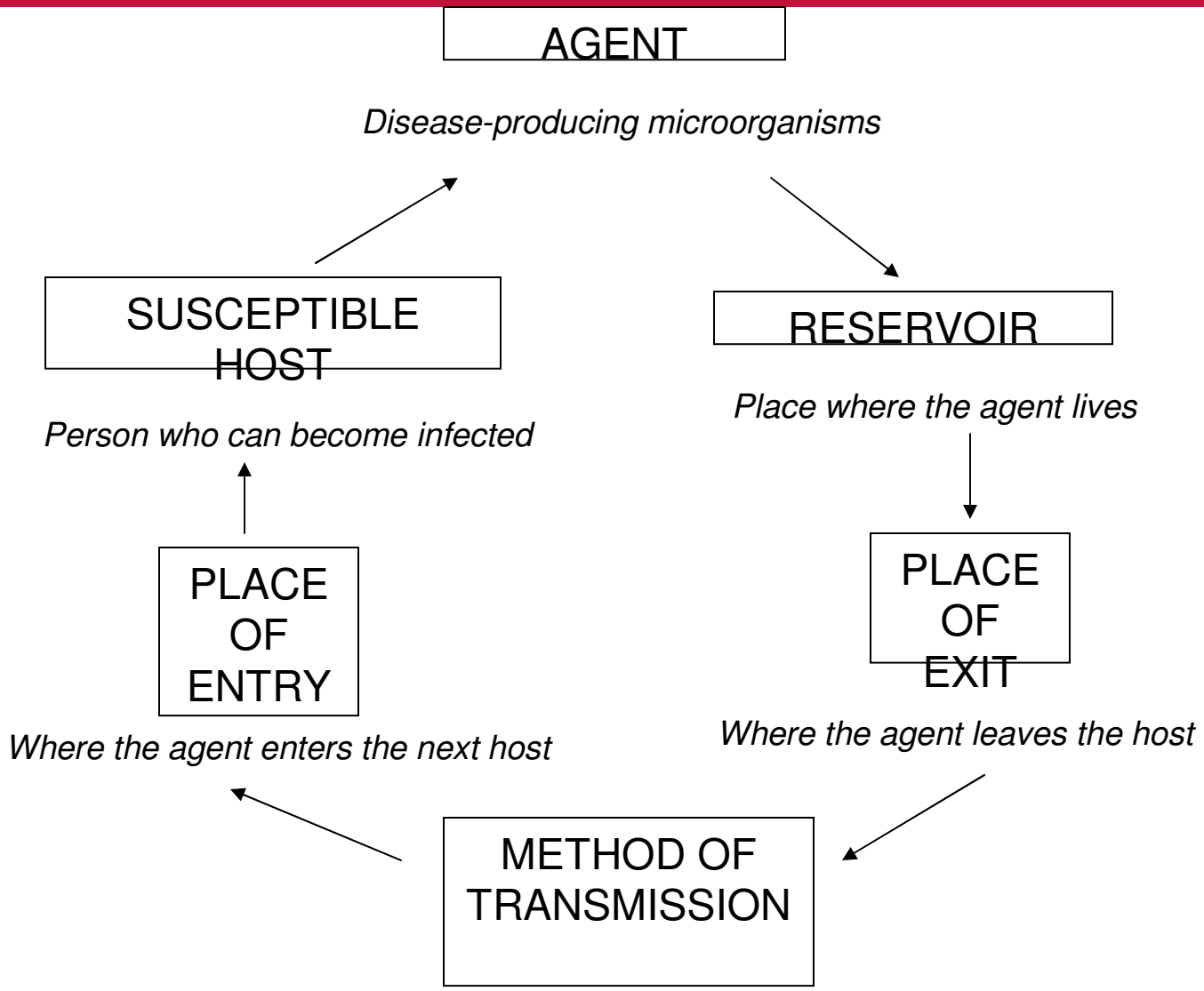
- Infection Prevention Background
- Basic Components of Infection Control
- Overview of Tuberculosis and IC Challenge
- Infection control at outpatient and lower level facilities
- Role of supervisors in infection control
- TB Prevention and control at the community level

## Purpose of Infection Prevention and Control

- To prevent post procedure infection
- To prevent infections in healthcare staff
- To provide high quality care
- To prevent the spread of infections from health care facilities to the community
- To prevent the spread of antibiotic-resistant microorganisms
- To lower the cost of health care services

*Source: EngenderHealth, 2001*

# Disease Transmission Cycle




*Source: JHPIEGO, 2003*

# Spread of Infectious Disease

- Airborne
- Blood or bodily fluids
- Direct contact with open wound or indirect contact through contaminated object
- Fecal-oral
- Food borne
- Animal or insects

## Who Is At Risk?

- Healthcare Staff
- Patients
- Community (Families)

## Infection Risk for Healthcare Staff

- Exposure on a daily basis for not only clinicians, but staff who process instruments, clean up after procedures, & dispose of waste are also at risk.
- Exposure can occur through:

  - Cutting or piercing of skin by contaminated instruments

  -Splashing of fluids on mucous membranes

  - Broken skin from cuts, scratches, rash, acne, fungal infections, etc.

*Source: EngenderHealth, 2001*

# Infection Risk for Clients

Clients are at risk when:

- Healthcare providers don't wash adequately wash their hands
- Clients aren't adequately prepared before a procedure
- Instruments and other items aren't appropriately cleaned or sanitized

*Source: EngenderHealth, 2001*

## Slide 8

**N1** "wash" repeated - remove
Ntombi Mhlongo, 2008/01/15

# Infection Risk for Communities

Communities are at risk from:

- Improper disposal of medical waste such as contaminated dressing or sharps, needles, syringes, etc.
- Waste often found by children in open dumps and spread out on the ground where people may come in contact with it.
- Infected healthcare workers who may also spread infection to their friends and families

*Source: EngenderHealth, 2001*

## Definition of Nosocomial Infection

"*An infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility.*"

*Source: Bemenson, 1995*

## Why Are Nosocomial Infections on The Rise?

- Invasive procedures that enable introduction of microorganisms
- Healthcare workers constantly exposed to infected people and materials
- Patients are already sick and more susceptible to infection
- Sick patients may have easily transmittable infections
- Treatment often provided to multiple patients in small physical space during short period of time
- Increased bacterial resistance to antibiotics (WHO)

*Source: EngenderHealth, 2001*

## Most Common Types of Nosocomial Infections

- Infections of surgical wounds
- Urinary tract infections
- Lower respiratory tract infections

## How to Prevent Nosocomial Infections

- Everyone plays a role, even non-clinicians
- Administration & management need to take the lead

  -Ensure appropriate policies are in place

  -Allocate sufficient resources for infection prevention & control

  -Provide ongoing staff training & supervision

  -Ongoing monitoring & evaluation

# Basic Components of Infection Prevention

- Wash hands
- Wear personal protective equipment (gloves, eye protection, face shields, & gowns)
- Use sharps carefully
- Correctly process instruments and client-care equipment
- Maintain appropriate waste-disposal practices
- Handle, transport, and process used/soiled linens appropriately

# Hand washing

Always wash hands or use an antiseptic hand rub:

- After touching any bodily fluid or after handling contaminated instruments
- Before putting on gloves and immediately after removal
- Before and after each patient contact

# Hand washing Basics

After hands are wet and soap applied be sure that:

- All areas of the hands and fingers are rubbed together for at least 10-15 seconds
- Be sure to clean under fingernails and between fingers
- Rinse hands thoroughly
- Dry hands with paper towel and use towel to turn off faucet

# Antiseptic Hand rub

- Wash hands first if visibly soiled or contaminated with bodily fluids
- Use enough antiseptic to cover both hands and fingers
- Be sure to clean under fingernails and between fingers
- Rub rapidly into fingers and hands until dry

## Personal Protective Equipment Gloves

- Wearing gloves doesn't replace the need for handwashing
- Clean gloves should be worn when:

  -Chance of contact with bodily fluids or contaminated skin

  -Performing invasive medical procedures

  -Handling contaminated items or surfaces

## Personal Protective Equipment Gloves Dos

- DO wear the correct size glove
- DO change gloves during prolonged cases
- DO keep fingernails relatively short
- DO pull gloves over cuffs of gown to protect wrists
- DO use water-soluble hand creams and moisturizers

*Source: JHPIEGO, 2003*

## Personal Protective Equipment – Facial Mask

Why wear a facial mask?

- To help block moisture from being expelled when healthcare workers speak, cough, or sneeze
- To help protect health care workers from accidental splashes of blood or other bodily fluid from entering their nose or mouth

*Source: JHPIEGO, 2003*

## Personal Protective Equipment – Facial Mask

In order for facial masks to be most effective:

-Must be large enough to fully cover the nose, lower face, jaw, and facial hair

-Must be made of fluid-resistant materials

## Personal Protective Equipment Surgical Gowns

- Need to be made of fluid-resistant material to provide some protection from blood & body fluids
- Don’t provide protection against large spills, worker should bathe immediately after exposure
- Protect patients from microorganisms on the skin of healthcare staff
- Sleeves need to be tapered at the wrist or have elastic to prevent accidental contamination

Source: JHPIEGO, 2003

# Handling of Soiled Linens

- Place used linen in bags directly after removal
- Linen soiled with harmful substances should be secured before transport
- Linens should not be rinsed or sorted in patient care areas
- Wash in hot water (70-80℃) and dry in the hot sun or in dryer

# Handling of Bedding

- Bedding with plastic covers should be wiped with neutral detergent
- If contaminated, mattresses without plastic covers need to be steam cleaned if possible or manually cleaned
- Pillows should be laundered or dry cleaned (if contaminated)
    - Key Interventions

## Factors Affecting Risk of TB Transmission

- Patient
- Recipient
- Bacterial
- Institutional

*Source: International Training & Research Centre, 2007*

# Patient Factors

- Severity of TB/level of infectiousness
- Adhering to good cough etiquette & infection control practices
- Treatment (time since start & adherence)
- Risk of TB Infection
- Health status of patient, such as strength of immune system and nutrition

*Source: International Training & Research Centre, 2007*

# Recipient Factors

- Level of contact with infected person(s)

  -Proximity

  -Length of contact

  -Frequency
- Compliance with infection control practices
- Vulnerability to infection

  (Age, nutritional status, overall health & strength of immune system)

*Source: International Training & Research Centre, 2007*

# Bacterial Factors

- Certain strains of TB (e.g. M(X)DR) may be more transmittable
- People with these strains could infect more people due to longer periods of infectiousness

*Source: International Training & Research Centre, 2007*

# Institutional Factors

- Quality of ventilation
- Level of crowding at facility
- Resources available for training, structural upgrades, and equipment
- Practices for cleaning and disinfection of equipment
- Specimen-handling procedures

*Source: International Training & Research Centre, 2007*

# TB in HIV Settings

- TB is the most common opportunistic infection & leading cause of death in PLWHA
- TB infection can progress much faster to TB disease in PLWHA
- People with known MDR TB should receive routine care outside of normal HIV settings

*Source: CDC, WHO, & The Union, 2006*

## TB in HIV Settings
## Steps to Prevent TB Transmission

1. **Screen** – Patients with cough > 2 weeks duration or being investigated/treated for TB should not wait in line with other patients.
2. **Educate** – Patients identified during screening should be taught cough hygiene.
3. **Separate** – TB suspects or cases should be separated, wait in well-ventilated area, & provided with mask or tissues to cover mouth & nose.

*Source: CDC, WHO, & The Union, 2006*

## TB in HIV Settings
## Steps to Prevent TB Transmission (continued)

4. **Provide HIV Services** – Symptomatic patients should be treated quickly to reduce exposure time to others.
5. **Investigate for TB or Refer** – Diagnostic tests should be performed onsite. If not available, facility should have established link with a diagnostic and treatment centers.

# Staff Training

- Each staff person should understand the importance of infection control & their role in following standards of care
- Job descriptions should include specific infection control duties
- Infection control should be part of pre-service and in-service training for all staff, including non-clinicians and volunteers

## Administrative & Support Procedures

One person designated as infection control officer who

- -Leads the infection control team
- -Oversees the monitoring of items within the infection control plan
- -Organizing and/or training staff as needed
- -Communicates needs to facility management

# Natural Ventilation

- Natural ventilation
  - Air enters and leaves building through doors and windows.
  - Needs to be effective in settings without centralized air system, particularly in areas where people congregate (e.g. waiting rooms)
  - If weather permits, important to have doors and windows open as much as possible
  - Propeller fans are an inexpensive way to increase natural ventilation

## How to Improve Natural Ventilation

- Ensure all occupied rooms have access to fresh outside air
- Keep doors, windows, and skylights open as much as possible
- Use fans and keep them running in occupied spaces
- Fans should be placed where air movement can be felt by all room occupants

## How to Improve Natural Ventilation (continued)

- If possible, fans should be placed in areas where they add to natural air currents and flow from clean to less clean areas
- If fans or open doors/windows cause excess noise, consider increasing ventilation during unoccupied periods

# Infection Control Nurse

- Responsible for daily infection control functions
- Primary point-of-contact with the facility administration regarding infection control
- Develop & disseminate infection control policies
- Oversee education of health care workers
- Implement the surveillance program

# TB Infection Control

- Each facility needs to have written infection control procedures specific to TB, which should include:

  - Prompt screening and recognition

  -Providing face masks or tissues to TB suspects or cases

  -Immediate isolation of TB suspects or cases

  -Triage

# Out Patient Management

- Outpatient management of TB patients is preferable
- Reduce risk of nosocomial infection of other patients or staff
- Inpatients should be regularly evaluated to determine outpatient care is feasible

## Surveillance/Screening of Health Care Workers

- All healthcare staff and volunteers need to be screened for TB when hired by blood or skin test
- Screening should be repeated at least once a year (or more depending on level of risk at facility)
- All staff and volunteers should be continuously monitored for signs and symptoms of TB, particularly persistent cough

# Symptomatic Employees

- Anyone with a persistent cough needs to evaluated for TB immediately.
- He/she should not return to work until:

  -TB is ruled out by physical exam, chest x-ray, & bacteriology OR

  -Disease is diagnosed & treated AND

  -Patient is determined to be non-infectious by physician

*Source: Francis J. Curry National Tuberculosis Center, 2007*

# TB Prevention & Control at the Community Level

## Reasons for Community Involvement

- Basic understanding of TB and how to prevent and control it
- Communities empowered to take control of health
- Improve demand for essential services
- Reduce workload at health facilities
- Strengthen general health promotion messages
- Provide platform for provision of other services at community level

*Source: WHO, 2003*

## Objectives for Community Involvement

- To improve management of TB cases and treatment adherence
- To empower community empowerment through education on TB-related issues
- To reduce financial burden for patients and their families of transport and lost time spent and income lost on attending health facilities for follow-up visits.

*Source: WHO, 2003*

## Successful Community Approaches

- Strong collaboration between health services, TB control programs, & community (religious institutions, schools, women/men's groups, etc.)
- Good education of TB patients & their families
- Good training of community supporters & health workers
- Strong supervision provided by TB program staff to community supporters

*Source: WHO, 2003*

# We can stop TB