Introduction to TB Infection Control
Fundamentals of Infection Control

- **Administrative controls:** reduce risk of exposure

- **Environmental controls:** prevent spread and reduce concentration of droplet nuclei

- **Respiratory protection controls:** further reduce risk of exposure to wearer only
Hierarchy of Infection Control

Administrative Controls

Environmental Controls

Respiratory Protection
Fundamentals of Infection Control

Hierarchy of Infection Control

- Administrative controls
  - Reduce risk of exposure via effective IC program

- Environmental controls
  - Prevent spread and reduce concentration of droplet nuclei

- Respiratory protection controls
  - Further reduce risk of exposure in special areas and circumstances
TB-Infection Controls: Simplified

• Administrative: WHO?
  – Who is a TB suspect?
  – Who is at risk from exposure?
  – Who has infectious TB?
  – Who has drug resistant TB?

• Environmental: WHERE?
  – Where is optimal place to minimize risk?

• Personal Respiratory Protection: Special high risk settings
Administrative Controls (1)

Most Important . . .

- Assign responsibility for TB infection control
- Work with health department to conduct TB risk assessment and develop written TB IC plan, including All precautions
- Ensure timely lab processing and reporting
- Implement policies and procedures for managing TB patients
Administrative Controls (2)

- Test and evaluate Health Care Workers (HCW) at risk for TB or for exposure to *Mycobacterium tuberculosis*
- Train HCWs about TB infection control
- Ensure proper cleaning of equipment
- Use appropriate signage advising cough etiquette and respiratory hygiene
Environmental Controls

- Control source of infection
- Dilute and remove contaminated air
- Control airflow
Respiratory Protection (RP) Controls

- Implement RP program
- Train HCWs in RP
- Train patients in respiratory hygiene
Relevance to Biologic Terrorism Preparedness

- Multidrug-resistant *M. tuberculosis* is classified as a category C agent of biologic terrorism

- Implementing guidelines in this document is essential to preventing the transmission of *M. tuberculosis* in healthcare settings
Environmental Controls

• Control source of infection

• Dilute and remove contaminated air

• Control airflow
  – Keep infectious air moving outside
  – Keep HCWs ‘upwind’, infectious patients ‘downwind’
Airborne Infection Isolation Room Policies

- Environmental factors and entry of visitors and HCWs should be controlled
- Air changes per hour (ACH) (volume/time)
  - >6 ACH (existing)
  - >12 ACH (new)
- Minimum of 2 ACH of outdoor air
- HCWs should wear at least N95 respirators
What is ventilation?

- Movement of air
- “Pushing” and/or “pulling” of particles and vapors
- Preferably in a controlled manner
Ventilation control

- Types of ventilation
  - Natural
  - Local
  - General
Local exhaust ventilation

- Source capture
  - Exterior hoods
  - Enclosing hoods

Uganda
Bronchoscopy
Natural vs Mechanical Ventilation

- Good natural ventilation is better than bad mechanical ventilation.
- Major limitation of natural ventilation is that it depends upon outdoor weather conditions.
- Can control odor and improve comfort of occupants, but not if very cold or very hot.
- Usually we do not have a choice and must work with where we are!
Room Air Cleaners
TB Outpatient unit – Helio Fraga Institute, MoH, Rio de Janeiro
Ultraviolet Germicidal Irradiation (UVGI)

- Used as supplement or back-up to dilution ventilation
- Does NOT provide negative pressure
- Requires maintenance, esp. cleaning bulbs
- Not effective at high humidity (>70%)
- Occupational exposure limits: eye & skin