EPIDEMIOLOGY AND RISK OF INFECTION IN OUTPATIENT SETTINGS
Statewide Program for Infection Control and Epidemiology (SPICE)
UNC School of Medicine

Module C

OBJECTIVES
- Discuss the infectious process
- Review methods for controlling transmission of infection in outpatient settings
  - Standard Precautions
  - Transmission-based Precautions
- Describe steps for detecting and controlling outbreaks

INFECTIONOUS AGENT OR “THE HARMFUL GERMS”
- Bacteria (MRSA, VRE)
- Viruses (Influenza, Norovirus)
- Fungi (Candida, Aspergillus)
- Parasites (Giardia, pinworms)
- Arthropods (mites)
  - Infestations, not infections

RESERVOIR OR “HIDING PLACES”
Where germs live, grow, and increase in numbers
- A person
- Environment/Fomite
- An animal

PEOPLE AS RESERVOIRS
- Blood
- Skin
- Digestive tract
  - Mouth, stomach, intestines
- Respiratory tract
  - Nose, throat, lungs
- Urinary tract
PORTALS OF EXIT AND ENTRY

EXIT OR “THE WAY OUT”
- Nose and mouth
  - Allows germs to leave in mucous droplets, and saliva or spit
- Gastrointestinal tract
  - Allows for germs to leave in stool and/or vomit
- Skin
  - Allows for germs to leave through direct contact, in blood, pus, or other liquids that come from the body.

ENTRY OR “THE WAY IN”
- Nose and mouth
  - Allows germs to enter in mucous droplets, and saliva or spit
- Gastrointestinal tract
  - Allows for germs to enter via ingestion
- Skin
  - Allows for germs to enter through direct contact, with blood, pus, or other liquids that come from the body.

SUSCEPTIBLE PERSON
- Age
- Stress
- Fatigue
- Poor Nutrition
- Chronic Illnesses
- Not properly vaccinated
- Open cuts, skin breakdown
- Medications

MODES OF TRANSMISSION

Person to Person
Environmental source

Contact
Droplet
Airborne

MODES OF TRANSMISSION CONTACT

DIRECT CONTACT
Person to person contact and physical transfer of organisms

INDIRECT CONTACT
Contact with a contaminated surface or device

Droplet – an infectious agent travels as a very large particle over a short distance by air current (usually 3-6 feet)

Droplets may arise from speaking, coughing or sneezing
Need to be relatively close
MODES OF TRANSMISSION

Airborne – infectious agent travels as very small particles over long distances by air current.

Small respiratory droplets, that can remain infective for long periods of time are dispersed when an infected person coughs, sneezes, laughs or speaks. May spread thru ventilation systems.

KNOWLEDGE CHECK

The Chain of Infection Includes which of the following:
1. Infectious agent, reservoir, mode of transmission and isolation precautions
2. Susceptible host, portal of entry, OSHA rules, medical waste
3. Mode of transmission, infectious agent, susceptible host, reservoir, portal of entry and portal of exit
4. None of the above

CONTROLLING TRANSMISSION OF INFECTION

As long as there is a means of transmission, infection will spread to others.

- Standard Precautions
- Transmission-Based Precautions

CONTROLLING TRANSMISSION

Standard Precautions
- Hand hygiene
- Use of personal protective equipment
- Respiratory hygiene/cough etiquette
- Safe injection practices
- Use of a mask when injecting the epidural space
- Safe handling of potentially contaminated equipment

THE BEST WAY TO STOP THE SPREAD OF INFECTION

Hand Hygiene

Good hand hygiene, including use of an alcohol-based hand rub and washing with soap and water is critical in reducing the risk of transmission of infections in any healthcare setting.

Use of an alcohol-based hand rub is recommended as primary mode of hand hygiene except when hands are visible soiled
- Dirt
- Blood,
- Body fluids
- Caring for patient with infectious diarrhea

Hand hygiene is discussed in detail in Module E, “principals of asepsis”
Second component of Standard Precautions is Personal Protective Equipment (PPE)

Wearable equipment that is intended to protect healthcare personnel from exposure or contact with infectious agent

Examples:
- Use of gowns to protect skin and clothing
- Use of gloves in situations involving possible contact with blood, body fluids, non-intact skin and/or mucous membranes
- Use of mouth, nose and eye protection during procedures likely to generate splashes or splatters of blood or other body fluids

USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

Three overriding principals related to personal protective equipment (PPE)

Wear PPE when the nature of the anticipated patient interaction indicates that contact with blood or body fluids may occur

Prevent contamination of clothing and skin during the process of removing PPE

Before leaving the patient’s room or cubicle, remove and discard PPE
GLOVES:

**DO**
- Wear gloves to reduce risk of contamination or exposure to blood/other body fluids
- Clean hands before donning sterile gloves
- Cleans hands after removing gloves
- Cleans hands and change gloves between task (moving from one body site to another)
- Make sure gloves correct type and fit
- Follow facility policy

**DON’T**
- Re-use or wash gloves (except for utility gloves)
- Substitute glove use for hand hygiene
- Use non-approved hand lotions
- Use gloves if damaged or visible soiled
- Touch your face when wearing gloves
- Wear the same pair from one patient to another
- Wear gloves in the hall
- Forget to remove and dispose of appropriately

CONTROLLING TRANSMISSION

RESPIRATORY HYGIENE/COUGH ETIQUETTE

- Third element of standard precautions is Respiratory Hygiene/Cough Etiquette
- Strategy designed to contain respiratory secretions:
  - Patients
  - Accompanying individuals who have signs and symptoms of a respiratory infection
- Initial point of encounter:
  - Triage
  - Reception area
  - Waiting rooms in emergency departments, outpatient clinics and physician offices

RESPIRATORY HYGIENE/COUGH ETIQUETTE

- Post signs at entrances
- Provide tissues and no-touch trash cans for disposal in waiting areas
- Provide hand hygiene product in waiting areas
- Offer mask to symptomatic patients
- Encourage ill patients to sit away from others

Process must be in place year round and not just during influenza season

CONTROLLING TRANSMISSION

TRANSMISSION BASED PRECAUTIONS

- Contact
- Droplet
- Airborne
**CONTACT PRECAUTIONS**

- Private room or Cohort
- Gown and gloves before or “upon entry”
- Hand hygiene
- Dedicate equipment
- Disinfect shared equipment

**Special enteric precautions for C. difficile and Norovirus**

- Routine handwashing with soap and water or ABHR

---

**DROPLET PRECAUTIONS**

- Surgical mask prior to entry
- No special ventilation
- Private room or Cohort
- Hand hygiene
- Patients/Residents use mask outside of room

**AIRBORNE INFECTION ISOLATION PRECAUTIONS**

- Private room only
- Room requires negative airflow pressure
- Doors must remain closed
- Visual air monitors
- Everyone must wear an N-95 respirator or higher
- Limit the movement and transport of the patient

---

**KNOWLEDGE CHECK**

What is the single most effective way to prevent the spread of infections?

1. Using PPE
2. Cleaning patient care equipment
3. Hand Hygiene
4. Coughing into the crook of elbow or tissue

**True or False**

Patients who require the use of droplet precautions should be allowed to wait in the waiting room with other patients.
OUTBREAK INVESTIGATION

The goal of the investigation is to control and prevent the spread of further disease.

OUTBREAK INVESTIGATION

Know Who to Call for Assistance
• Your Supervisor/Manager
• Local Health Department
• North Carolina Division of Public Health
  919-733-3419
• Statewide Program for Infection Control and Epidemiology (SPICE)
  spice@unc.edu
  919-966-3242

OUTBREAKS STEPS

► Verify diagnosis
► Establish case definition
► Review for cases – case search
► Create a line listing
► Make an epi-curve
► Develop hypothesis
► Test hypothesis
► Control measures
► Evaluate control measures
► Disseminate information

KNOWLEDGE CHECK

Who should be notified of a suspected or known communicable disease outbreak?

a) Risk Management
b) Administration/Director
c) Local Health Department
d) All of the above

SUMMARY

Discuss the “chain of infection”
Review standard and transmission-based precautions for controlling transmission of infections in outpatient settings
Describe the steps for detecting and controlling outbreaks

QUESTIONS?