

5:1 Changing Patterns of Disease

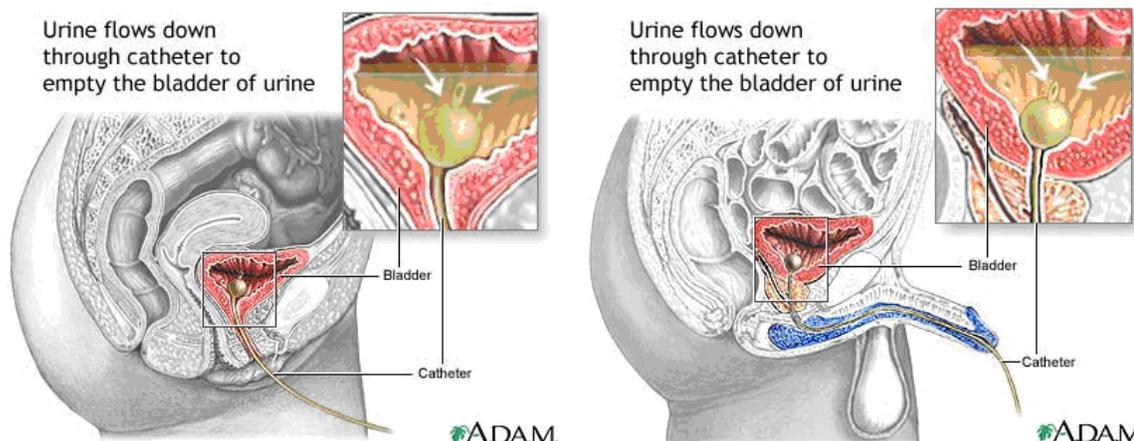
In the past 100 years, since the discovery of the Germ Theory of Disease was accepted:

- We have learned that microbes cause many diseases.
- Transmission of disease has been defined.
- Disease prevention methods have been put in place.
- Chemotherapeutic drugs and antibiotics have become available to combat infections.
- Many dreaded organisms have been curtailed or “extinct.”

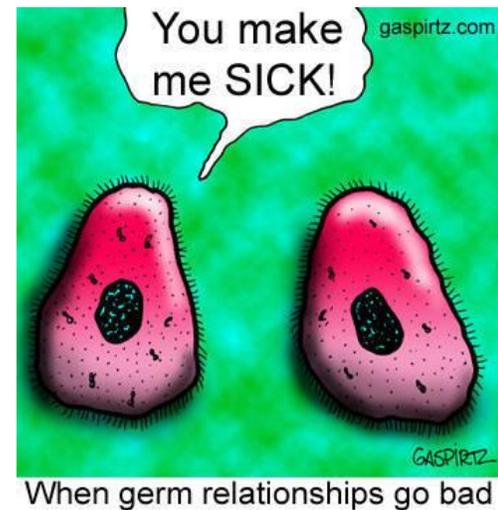
However, “technology” has led to occurrence of infections by opportunistic microbes (“normal flora” or “non-pathogens”.)

Situations Leading to Opportunistic Infections

1. Use of immunosuppressants to prevent rejection of organ transplants.
2. Use of cancer chemotherapy or irradiation.
3. Use of kidney dialysis machines or heart pumps.
4. Frequent use of urethral catheters.



5. Use of antibiotics, which disturbs balance of normal flora.
6. Poor nutritional status.

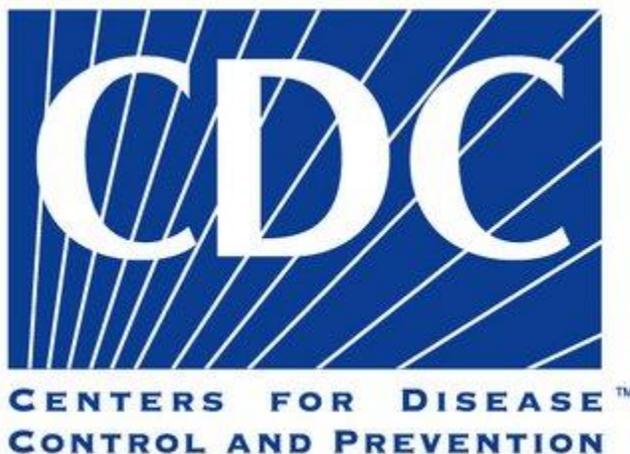


5:2 Epidemiology

EPIDEMIOLOGY: the study of disease occurrence in human populations

Epidemiologists study-

1. Who gets a disease?
2. How does an individual acquire the disease?
3. How can the disease be prevented?
4. What is the source of a disease agent causing an unexplained number of infections?
5. What is the source of an infectious agent causing a previously undescribed disease?



CENTERS FOR DISEASE CONTROL: (CDC) federal agency that keeps data on disease occurrence and carries out prevention programs

CDC is the central source of epidemiological information in the US, and is located in Atlanta, Georgia.

CDC publishes the *Morbidity and Mortality Weekly Report* (MMWR) containing data on:

1. MORBIDITY: the incidence of specific diseases
2. MORTALITY: the number of deaths resulting from specific disease

MMWR also includes articles on disease outbreaks, case histories, diagnosis, immunization, and treatment.



5:3 Diagnosis of Infectious Disease

Symptoms Common to Many Diseases:

1. Malaise
2. Headache
3. Fever
4. Chills
5. Cough

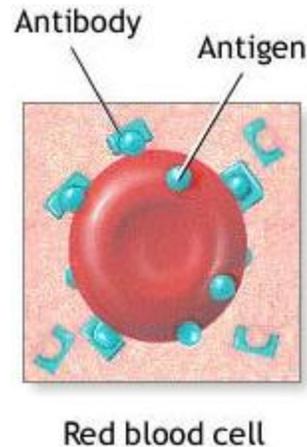


This makes it difficult to diagnose diseases by clinical symptoms only.

Levels of Diagnosis of Infectious Disease

1. CLINICAL DIAGNOSIS: diagnosis of a disease using physical symptoms only

2. Presence of antibody against the disease antigen in patients' blood.



An antigen is a substance that induces the formation of antibodies because it is recognized by the immune system as a threat

3. Isolation and identification of disease-causing organism from infected individual.

This is the best specific diagnosis, but depends on proper collection of specimens.

5:4 Collection of Specimens for Bacteriological Diagnosis

Material for bacterial diagnosis must be properly collected and delivered to diagnostic lab or diagnosis will not be possible.

Rules for Collection and Delivery of Specimens

1. Collect adequate amount of correct specimen.
2. Transport quickly to lab to prevent death or contamination of causative organism.
3. Inoculate specimen into growth medium if needed.

5:5 Proper Collection Procedures

Collection of Blood Specimens

****Blood is normally STERILE; skin is not.**



1. Clean skin with 70% alcohol to remove dirt, lipids, and fatty acids.
2. Use gauze pad with 2% iodophor to scrub skin, leave on for 1 minute.
3. Remove iodine solution with sterile gauze pad soaked in 70% alcohol.
4. DO NOT PALPATE VEIN.
5. Withdraw blood with sterile needle and syringe or blood collection tube.

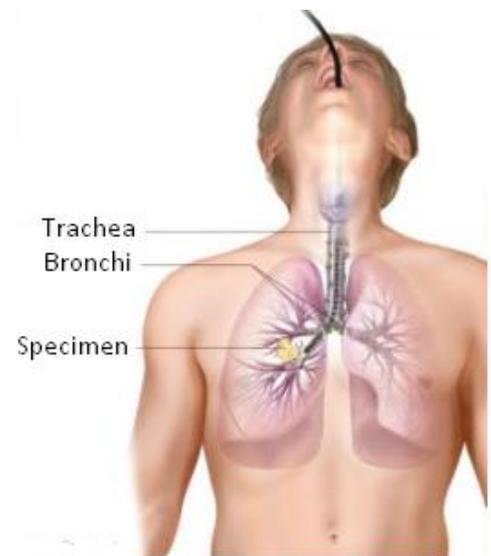
Collection of Respiratory Tract Specimens

➤ The upper respiratory tract contains many normal flora, all specimens must be brought up from lower tract by

1. Deep cough.
2. Transtracheal aspiration (needle, 30 cm tube into lung.)

➤ Upper respiratory specimens may be obtained by

1. Sterile cotton swab on throat.
2. Passing sterile cotton swab through mouth into nasopharyngeal passage.



Collection of Specimens from Wounds or Abscesses



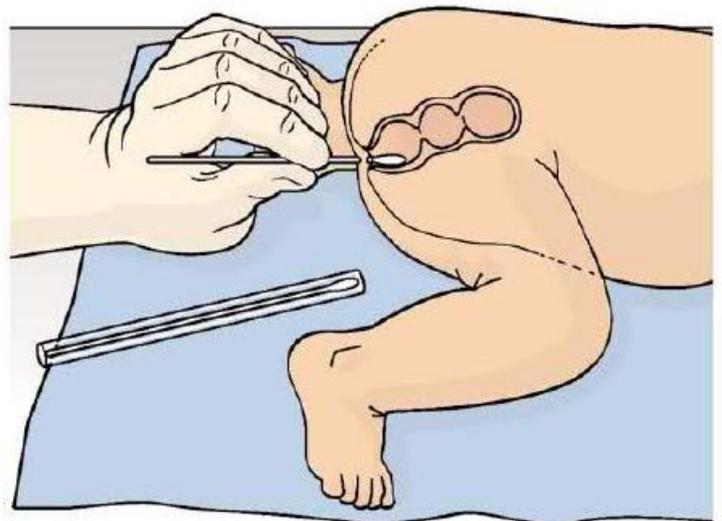
1. Collect using sterile needle and syringe.
2. Do not expose to oxygen, most bacteria in wounds or abscesses are obligate anaerobes.

Collection of Intestinal Specimens

1. Fecal specimens may be either voided or collected with a sterile cotton swab inserted past the anal sphincter and rotated.

2. Fecal specimens must be placed in stool preservative to insure viability.

Collection of Stool Specimen



Collection of Urine Specimens

➤ Most urinary tract infections are caused by normal flora.

1. Urethral catheterization (may introduce microorganisms into bladder.)
2. Voided sample (preferred method, but will contain some bacteria.)

