Chapter 31
Infectious and Communicable Diseases

Learning Objectives (Cont’d)
- Review the specific anatomy and physiology pertinent to infectious and communicable diseases
- Define specific terminology identified with infectious and communicable diseases
- Discuss public health principles relevant to infectious and communicable diseases

Learning Objectives (Cont’d)
- Identify public health agencies involved in prevention and management of disease outbreaks
- For specific diseases, identify and discuss personal protection issues
- Describe and discuss the rationale for various types of personal protective equipment (PPE)
Learning Objectives (Cont’d)

- Discuss what constitutes significant exposure to an infectious agent
- List and describe steps of the infectious process
- List and describe stages of infectious diseases

Learning Objectives (Cont’d)

- List and describe infectious agents, including bacteria, viruses, fungi, protozoans, helminths (worms), and prions
- Describe host defense mechanisms against infection

Learning Objectives (Cont’d)

- Describe processes of immune system defenses, including humoral and cell-mediated immunity
- Describe characteristics of the immune system, including categories of white blood cells, the mononuclear phagocyte system, and the complement system
Learning Objectives (Cont'd)

- Describe the assessment of a patient suspected of or identified as having an infectious/communicable disease
- Discuss proper disposal of contaminated supplies (e.g., sharps, gauze sponges, tourniquets)

Learning Objectives (Cont'd)

- Discuss relative to the human immunodeficiency virus:
  - Causative agent
  - Body systems affected and potential secondary complications
  - Modes of transmission
  - Seroconversion rate after direct significant exposure
  - Susceptibility and resistance
  - Signs and symptoms
  - Specific patient management
  - Personal protective measures

Learning Objectives (Cont'd)

- Discuss hepatitis A (infectious hepatitis):
  - Causative agent
  - Body systems affected
  - Potential secondary complications
  - Routes of transmission
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization
Learning Objectives (Cont'd)

- Discuss hepatitis B (serum hepatitis):
  - Causative agent
  - Organ affected
  - Potential secondary complications
  - Routes of transmission
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization
  - Susceptibility, resistance

Learning Objectives (Cont'd)

- Discuss hepatitis C:
  - Causative agent
  - Organs affected
  - Transmission routes
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Control measures

Learning Objectives (Cont'd)

- Discuss hepatitis D (hepatitis delta virus):
  - Causative agent
  - Organs affected
  - Transmission routes
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Control measures
Learning Objectives (Cont'd)

- Discuss hepatitis E:
  - Causative agent
  - Organs affected
  - Transmission routes
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Control measures

Learning Objectives (Cont'd)

- Discuss tuberculosis:
  - Causative agent
  - Body systems affected
  - Secondary complications
  - Transmission routes
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Control measures

Learning Objectives (Cont'd)

- Discuss meningococcal meningitis (spinal meningitis):
  - Causative organisms
  - Tissues affected
  - Transmission modes
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization
  - Control measures
Learning Objectives (Cont'd)

- Discuss other infectious agents known to cause meningitis, including *Streptococcus pneumoniae*, *Haemophilus influenzae* type b, and other varieties of viruses

Learning Objectives (Cont'd)

- Discuss pneumonia:
  - Causative organisms
  - Body systems affected
  - Transmission routes
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization

Learning Objectives (Cont'd)

- Discuss tetanus:
  - Causative organism
  - Body system affected
  - Transmission modes
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization
Learning Objectives (Cont'd)

- Discuss rabies and hantavirus as they apply to regional environmental exposures
  - Causative organisms
  - Body systems affected
  - Transmission routes
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Control measures

Learning Objectives (Cont'd)

- Identify pediatric viral diseases
- Discuss chickenpox:
  - Causative organism
  - Body system affected
  - Transmission mode
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization
  - Control measures

Learning Objectives (Cont'd)

- Discuss mumps:
  - Causative organism
  - Body system affected
  - Transmission mode
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization
Learning Objectives (Cont'd)

- Discuss rubella (German measles):
  - Causative organism
  - Body system affected
  - Transmission mode
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization

Learning Objectives (Cont'd)

- Discuss measles (rubeola, hard measles):
  - Causative organism
  - Body system affected
  - Transmission mode
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization

Learning Objectives (Cont'd)

- Discuss the importance of immunization and diseases, especially in the pediatric population, that warrant widespread immunization
Learning Objectives (Cont'd)

- Discuss pertussis (whooping cough):
  - Causative organism
  - Body system affected
  - Transmission mode
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization

Learning Objectives (Cont'd)

- Discuss influenza:
  - Causative organism
  - Body system affected
  - Transmission mode
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization

Learning Objectives (Cont'd)

- Discuss mononucleosis:
  - Causative organism
  - Body system affected
  - Transmission mode
  - Susceptibility and resistance
  - Signs and symptoms
  - Patient management
  - Protective measures
  - Immunization
Learning Objectives (Cont’d)

- Discuss the characteristics of and organisms associated with febrile and afebrile respiratory disease, including:
  - Bronchiolitis
  - Bronchitis
  - Laryngitis
  - Croup
  - Epiglottitis
  - Common cold

Learning Objectives (Cont’d)

- Discuss syphilis:
  - Causative organism
  - Body regions, organs, and systems affected
  - Transmission modes
  - Susceptibility and resistance
  - Stages of signs and symptoms
  - Patient management
  - Protective measures

Learning Objectives (Cont’d)

- Discuss gonorrhea:
  - Causative organism
  - Body regions, organs, and systems affected
  - Transmission modes
  - Susceptibility and resistance
  - Stages of signs and symptoms
  - Patient management
  - Protective measures
Learning Objectives (Cont'd)
• Discuss chlamydia:
  ➢ Causative organism
  ➢ Body regions, organs, and systems affected
  ➢ Transmission modes
  ➢ Susceptibility and resistance
  ➢ Stages of signs and symptoms
  ➢ Patient management
  ➢ Protective measures

Learning Objectives (Cont'd)
• Discuss herpes simplex type 1:
  ➢ Causative organism
  ➢ Body regions, organs, and systems affected
  ➢ Transmission modes
  ➢ Susceptibility and resistance
  ➢ Stages of signs and symptoms
  ➢ Patient management
  ➢ Protective measures

Learning Objectives (Cont'd)
• Discuss herpes simplex 2 (genital herpes):
  ➢ Causative organism
  ➢ Body regions, organs, and systems affected
  ➢ Transmission modes
  ➢ Susceptibility and resistance
  ➢ Stages of signs and symptoms
  ➢ Patient management
  ➢ Protective measures
Learning Objectives (Cont'd)

- Discuss scabies:
  - Causative organism
  - Body regions, organs, and systems affected
  - Transmission modes
  - Susceptibility and resistance
  - Stages of signs and symptoms
  - Patient management
  - Protective measures

- Discuss lice:
  - Causative organism
  - Body regions, organs, and systems affected
  - Transmission modes
  - Susceptibility and resistance
  - Stages of signs and symptoms
  - Patient management
  - Protective measures
  - Prevention

- Describe Lyme disease:
  - Causative organism
  - Body regions, organs, and systems affected
  - Transmission modes
  - Susceptibility and resistance
  - Stages of signs and symptoms
  - Patient management
  - Protective measures
Learning Objectives (Cont'd)

- Discuss gastroenteritis:
  - Causative organism
  - Body regions, organs, and systems affected
  - Transmission modes
  - Susceptibility and resistance
  - Stages of signs and symptoms
  - Patient management
  - Protective measures

Learning Objectives (Cont'd)

- Discuss the local protocol for reporting and documenting infectious/communicable disease exposure

Introduction

- Identify multiple diseases, infections
  - Signs, symptoms
  - Prehospital definitive treatment
- Local, federal response
  - Local infections, outbreaks
  - Widespread infections, outbreaks
Infectious Diseases and Public Health

- Agencies involved in prevention and management of infectious diseases
  - Public health agencies
  - State agencies
  - Private sector level
  - Federal level

Infectious Diseases and Public Health (Cont’d)

- Exposure plans for health agencies
  - Plan components
    - Health maintenance
    - Employee surveillance
    - Designated officer
    - Monitoring response to communicable diseases
    - Identification of job classifications
    - Schedule of blood-borne pathogens

- Procedures for exposure, postexposure counseling
- Interfacing with and notifying local health authorities, state and federal agencies
- Maintain personal, vehicular, and building disinfection and storage
- Hazardous materials education
Infectious Diseases and Public Health (Cont’d)

- Paramedic responsibilities
  - Infection control attitude
  - Personal hygiene
  - Attention to wounds, skin
  - Effective handwashing
  - Disposal of needle and body fluid-tinged supplies

Process of Infection

- Stages of infectious disease
  - Incubation period
  - Window period
  - Communicable period
  - Latent period
  - Disease period

Process of Infection (Cont’d)

- Types of infectious agents
  - Bacteria
  - Viruses
  - Fungi
  - Protozoa
  - Helminths
  - Prions
Process of Infection (Cont’d)

- Host defense mechanism
  - Anatomic barriers
    - Skin
    - Turbinates
    - Nasal hairs
    - Mucus
    - Bacterial flora
    - Stomach acids

Process of Infection (Cont’d)

- Host defense mechanism
  - Inflammatory response
    - Physical
    - Thermal
    - Chemical
    - Invasion by microorganism

Process of Infection (Cont’d)

- Host defense mechanism
  - Immune system
    - Humoral immunity
    - Cell-mediated immunity
    - Reticuloendothelial system (RES)
Approach to Patients with Possible Infectious Disease

- Must have detailed approach
- Always suspect infectious diseases
- Wear gloves, glasses on all calls, gowns when needed

Approach to Patients with Possible Infectious Disease (Cont’d)

- Focused history and physical examination
  - History of present illness
  - Onset
  - Fever
  - Antipyretic use
  - Neck pain, rigidity
  - Rashes
  - Difficulty swallowing, secretions
  - Changes in signs/symptoms over time

Approach to Patients with Possible Infectious Disease (Cont’d)

- Past medical history
  - Chronic infections
  - Steroid, antibiotic use
  - Organ transplantation
  - Diabetes, other endocrine disorders
  - Chronic obstructive disease
  - Respiratory complications
Approach to Patients with Possible Infectious Disease (Cont’d)

- Detailed history
  - Skin temperature, hydration, color
  - Assess sclera for icterus
  - Reaction to neck flexion
  - Breath sounds
  - Abdominal tenderness
  - Extremity or digit lesions

Infectious Diseases

- Human immunodeficiency virus (HIV)
  - Transmitted through fluids between human beings
  - Two strands: HIV-1, HIV-2
  - Diagnose by documenting decrease of CD4/T helper cells
  - 40,000 people infected annually
  - Spread

Infectious Diseases (Cont’d)

- HIV
  - May not know for years until opportunistic diseases lead to diagnosis
  - Transmission can occur without host’s knowledge
  - Malaise
  - Lymph node swelling
  - Diarrhea increase
  - Unintended weight loss
  - Evening fevers
Infectious Diseases (Cont’d)

- HIV
  - Sweating episodes
  - Physical signs include Kaposi sarcoma
  - Once diagnosed, despondent, depression
  - No cure
  - Must follow standard precautions at all times

Infectious Diseases (Cont’d)

Human Immunodeficiency Virus

Infectious Diseases (Cont’d)

- Hepatitis
  - Hepatitis A virus (HAV)
    - Spread by oral-fecal route
    - Person-to-person spread
    - Contaminated water, food
    - Poor sanitation
    - Overcrowding
    - Enters body by ingestion, spreads to liver
    - Incubation: 30 days
Infectious Diseases (Cont’d)

- Hepatitis
  - Hepatitis A virus (HAV)
    - Symptoms
      - Jaundice
      - Abrupt onset of fever
      - Weakness
      - Anorexia
      - Abdominal discomfort
      - Nausea
      - Urine darkening
      - Liver failure rare with treatment

- Hepatitis
  - Hepatitis B virus (HBV)
    - Many of the same symptoms as HAV
    - Cannot distinguish without laboratory testing
    - Transmission through blood, other body fluids
    - Patient’s age is the largest factor in chronic HBV infection
    - No specific treatment
    - Vaccination available
    - Prevention
Infectious Diseases (Cont’d)

- **Hepatitis**
  - **Hepatitis C (HVC)**
    - Blood-borne virus
    - Transmission
      - Most commonly by needles
      - Blood transfusions
      - Occupational exposure
      - IV drug abuse
    - Alcoholic liver disease
    - Incubation: 7-9 weeks

Infectious Diseases (Cont’d)

- **Hepatitis**
  - **Hepatitis C (HVC)**
    - Signs/symptoms
      - Jaundice
      - Malaise
      - Fever
      - Change in urine and stool color
      - Many are asymptomatic
    - Supportive care
    - Standard precautions, proper handwashing

Infectious Diseases (Cont’d)

- **Hepatitis**
  - **Hepatitis D, E, G**
    - **Hepatitis D**
      - Delta virus
      - Not complete virus, does infect cell with other than A, B, C virus
      - When infected with HIV, D becomes pathogenic
    - **Hepatitis E** spreads like HAV
    - **Hepatitis G** is a newly identified virus
    - Supportive care, IV fluids
Infectious Diseases (Cont’d)

- Tuberculosis
  - Lung disorder
  - Causative agent: *Mycobacterium tuberculosis*
  - Person-to-person transmission through aerosolized nuclei
  - Active in air, once it hits ground it becomes inactive

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Infectious Diseases (Cont’d)

- Tuberculosis
  - High-risk populations
    - Nursing homes
    - Healthcare facilities
    - Prisons
    - Medically underserved low-income
    - Alcoholics
    - IV drug users
    - Homeless

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Infectious Diseases (Cont’d)

- Tuberculosis
  - Symptoms start gradually
    - Fever at night with night sweats
    - Malaise
    - Weight loss
    - Nonproductive cough, becomes productive later with hemoptysis
    - Pleuritic chest pain
    - Dyspnea
    - Respiratory failure
Infectious Diseases (Cont’d)

- Tuberculosis
  - Physical examination
    - Crackles or rales
    - Hollow/amphoric cavity sounds
  - Differential diagnosis
    - Asthma
    - Pneumonia
    - Pleural effusion
    - Meningitis
    - Septic shock
    - Respiratory distress syndrome

Infectious Diseases (Cont’d)

- Tuberculosis (Cont’d)
  - Treatment
    - Isoniazid
    - Rifampin
    - Ethambutol
    - Pyrazinamide
    - Streptomycin

Infectious Diseases (Cont’d)
Meningitis
- Inflammatory disease of the CNS
- Growth of virus, bacteria, fungus in and adjacent to leptomeninges
- Aseptic meningitis
  - Viral, self-limited
  - Complete recovery

Meningitis
- Bacterial
  - More severe
  - Potentially life-threatening
  - Spread
    - Direct, prolonged exposure to infected person
    - During intubation, CPR
  - Metastatic infection associated with pneumonia, otitis media, endocarditis

Meningitis
- Symptoms
  - Fever
  - Stiff neck
  - Petechial rash
  - Altered level of consciousness
  - Diffuse neurological deficits
  - Vomiting
  - Kernig sign
  - Bublinski sign
  - Increased intracranial pressure
  - Refusal to eat
  - Unexplained irritability
  - Lethargy
  - Bulging fontanelles
  - Seizures
Infectious Diseases (Cont’d)

• Meningitis
  ➢ Differential diagnosis
    • Subarachnoid hemorrhage
    • Herpes simplex encephalitis
    • Delirium tremens
  ➢ Treatment includes antibiotics, supportive to protect against dehydration

Infectious Diseases (Cont’d)

• Meningitis
  ➢ Prevention
    • Early inoculation from purified polysaccharide vaccines with minimal and infrequent side effects
    • Respiratory protection
    • Standard precautions
Infectious Diseases (Cont’d)

• Pneumonia
  ➢ Inflammatory respiratory infection
  ➢ Affects alveoli, surrounding tissues
  ➢ Winter months
  ➢ Deadly in elderly
  ➢ Caused by bacterial, fungal, and viral organisms
    • Attack respiratory and CNS

Infectious Diseases (Cont’d)

• Pneumonia
  ➢ Community- or hospital-acquired pneumonia, with hospital-acquired pneumonia having a higher mortality
  ➢ Transmission
    • Droplet
    • Direct contact with host through contaminated linens

Infectious Diseases (Cont’d)

• Pneumonia
  ➢ High risk groups
    • Sickle cell disease
    • Cardiac disease
    • Diabetes mellitus
    • Chronic renal failure
    • HIV
    • Organ transplantation
    • Lymphoma
Infectious Diseases (Cont’d)

- Pneumonia
  - Symptoms
    - Chills, fever
    - Chest discomfort with respiration
    - Difficulty breathing

Infectious Diseases (Cont’d)

- Pneumonia
  - Physical findings
    - Respiratory distress
    - Fever
    - Tachycardia
    - Tachypnea
    - Potentially low O₂ saturation
    - Crackles

Infectious Diseases (Cont’d)

- Pneumonia
  - Atypical pneumonia symptoms
    - Gradual onset
    - Nonproductive cough
    - Low-grade fever
    - Absence of fever, chills, headache, nausea and vomiting
    - Sore throat
    - Extrapulmonary symptoms
Tetanus

- Bacterial spore: *Clostridium tetani*
- Commonly found in soil and GI tract of animals
- Introduced to body through disruption of skin
- Interferes with neurons that inhibit muscular contraction
- Signs/symptoms
  - Tetany of jaw and neck
  - Children: abdominal rigidity
  - Adult: facial contortion—risus sardonicus

- Signs/symptoms
  - Muscular tetany of jaw, neck muscles
  - Abdominal rigidity first sign in children
  - Facial contortion—risus sardonicus

- Treatment
  - Tetanus immune globulin or tetanus antitoxin
  - Tetanus immunization with booster
Infectious Diseases (Cont’d)

- **Rabies**
  - Viral infection of mammals caused by rhabdovirus
  - Transmitted by infected saliva into bite wound
  - Phases
    - Prodrome
    - Excitatory
    - Paralytic

Infectious Diseases (Cont’d)

- **Rabies**
  - Prodrome phase
    - Symptoms
      - Fever
      - Malaise
      - Headache
      - Anorexia
      - Nausea, vomiting
      - Sore throat
      - Poorly defined sensory changes
      - Rhinitis
      - Anxiety
      - Agitation
      - GI symptoms
      - Parasthesia
      - Pruritus
      - Pain at site of bite

Infectious Diseases (Cont’d)

- **Rabies**
  - Excitatory phase
    - Symptoms
      - Can be absent
      - Begins gradually, persists until death
      - Progressive anxiety
      - Agitation
      - Apprehension
      - Impending doom
      - Disorientation
      - Neck muscle spasms
      - Twitching
      - Tactile
      - Hydrophobia
Infectious Diseases (Cont'd)

- Rabies
  - Paralytic phase
    - Symptoms
      - General flaccid paralysis
      - Shiver
      - Coma
      - Urinary incontinence
      - Peripheral vascular collapse
      - Death

- Rabies
  - Clinical rabies is almost always fatal
  - Prevention
    - Avoid exposure to infected animals
    - Cleansing wounds
    - Immunization after exposure
Infectious Diseases (Cont’d)

- Hantaviruses
  - Consists of hemorrhagic fever
    - Renal syndromes (HFRS)
    - Pulmonary syndromes (HPS)
  - Rodent borne
  - Enters body through respiratory mucosa

Infectious Diseases (Cont’d)

- Hantaviruses
  - Symptoms
    - Fever
    - Hemorrhage
    - Renal failure
    - Headache
    - Abdominal and lumbar pain
    - Proteinuria
    - Initially febrile, develops hypotension and oliguria
    - Diuresis

Infectious Diseases (Cont’d)

- Hantaviruses
  - Febrile stage
    - Blurred vision
    - Photophobia
    - Retroorbital pain
    - Face, neck, and back flushed
    - Pharyngeal and conjunctival stain
    - Petechiae in conjunctivae, axillae, and its pressure points
Infectious Diseases (Cont'd)

- Hantaviruses
  - Hypotensive phase
    - Rising hematocrit level
    - Capillary leak syndrome
    - Massive proteinuria and oliguria present

- Hantaviruses
  - Oliguric phase
    - Severe hemorrhagic phenomena
    - Majority of deaths
    - Fever with GI symptoms followed by brief oliguria
  - Treatment
    - Ribavirin if administered in first 7 days
    - Supportive care

Infectious Diseases (Cont'd)

- Viral diseases of childhood
  - Varicella-zoster (chickenpox)
    - Integumentary system
    - Vesicular rash
    - Herpesvirus family
    - Airborne
    - Virus latent in dorsal root ganglia, can reactivate later in life, herpes zoster
Infectious Diseases (Cont’d)

- Viral diseases of childhood
  - Varicella-zoster (chickenpox)
    - Spread
      - Contact with mucosa of upper respiratory tract or conjunctiva
      - Contact with ruptured vesicles
    - Lesions
      - More numerous on trunk
      - Begin as small red spots, become blisters on erythematous base
      - Form for up to 5 days
      - Heal over 3 weeks
  - Antiviral drugs shorten duration
  - Acetaminophen
  - Aspirin avoided
  - Standard precautions
  - Vaccination
Infectious Diseases (Cont'd)

- Mumps
  - Acute viral infection
  - Caused by Paramyxoviridae family
  - General infection, tenderness and swelling of parotid and salivary glands
  - At risk for developing aseptic meningitis
  - Spread
    - Droplet transmission
    - Contact with saliva of infected person

Infectious Diseases (Cont'd)

- Mumps
  - Most contagious 1-2 days before and 5 days after parotid swelling
  - Incubation: 12-25 days
  - Vaccination

Infectious Diseases (Cont'd)

- Mumps
  - Presentation
    - Low-grade fever
    - Headache
    - Malaise
    - Anorexia
    - Upper and lower respiratory symptoms
    - Parotitis
  - Enlargement of face and jaw
  - Sublingual glands swelling, dysphagia, tongue swelling
  - Hearing loss
  - Pancreatitis
  - Arthritis
Infectious Diseases (Cont’d)

- **Mumps**
  - Treatment is supportive
  - Acetaminophen and ibuprofen
  - Encourage patient to stay hydrated, fed
  - EMS should not work without vaccination
  - Standard precautions
  - Surgical mask
  - Thorough handwashing

Infectious Diseases (Cont’d)

- **Rubella**
  - German measles
  - Affects integumentary and musculoskeletal systems, lymph nodes
  - Spread
    - Inhalation from the respiratory tract of infected person
    - Nasopharyngeal secretions
    - Mother to fetus
Infectious Diseases (Cont'd)

- Rubella
  - Presentation
    - Headache
    - Low-grade fever
    - Conjunctivitis
    - Malaise
    - Respiratory symptoms
    - Cervical, postauricular, occipital lymph nodes swollen and tender
    - Rash starts at face, spreads down the trunk to extremities within 1 hour

Infectious Diseases (Cont'd)

- Measles (rubeola, hard measles)
  - Highly contagious, caused by measles virus of Paramyxoviridae family
  - Affects the respiratory system, CNS, mouth, pharynx, rash
  - Spread
    - Direct contact
    - Droplets from nasopharynx
Infectious Diseases (Cont’d)

- Measles
  - Prodromal symptoms
    - Hacking cough
    - Conjunctivitis
    - Eyelid swelling
    - Photophobia
    - Temperature up to 105°F
    - Koplik spots on buccal mucosa of upper lip or just opposite molars

- Measles
  - Rash
    - First behind ears, forehead, in hairline
    - Spreads down over trunk and abdomen
    - Reaches feet by third day
    - Appears thicker over head and shoulders, begins to clear, follows same pattern toward feet
    - Lasts 6 days

- Measles
  - Secondary infections
    - Laryngitis
    - Otitis media
    - Myocarditis
    - Eye damage
    - Pneumonia
    - Subacute sclerosing panencephalitis (SSPE)
Infectious Diseases (Cont’d)

Rubeola

Infectious Diseases (Cont’d)

- Pertussis (whooping cough)
  - Forceful cough
  - Affects oropharynx
  - Transmitted by airborne droplets from infected host
  - Catarrhal phase
    - Upper respiratory infection

Infectious Diseases (Cont’d)

- Pertussis
  - Paroxysmal phase
    - Lasts 2-4 weeks
    - Episodic sudden coughing
    - Cyanosis
    - Tongue protrusion
    - Diaphoresis
  - Salivation
  - Lacrimation
  - Vomiting
  - Syncope
  - Apnea
Infectious Diseases (Cont’d)

- Pertussis
  - Convalescent phase
  - Final phase
    - Cough, lasts from weeks to months
  - Cautious of patient with paroxysmal cough
  - Standard precautions
  - Vaccinations, booster doses recommended

Infectious Diseases (Cont’d)

- Other viral diseases
  - Influenza
    - One of the most common infectious diseases
    - Affects the respiratory system
    - Influenza A most common cause
    - Influenza B causes regional, widespread epidemics every 2-3 years
    - Influenza C rarely causes epidemics

Infectious Diseases (Cont’d)

- Other viral diseases
  - Influenza
    - Spreads through air, direct contact
    - Can live outside of body for several hours in settings with low humidity, low temperature
    - Different vaccination yearly, different strains
Infectious Diseases (Cont’d)

- Other viral diseases
  - Influenza
    - Findings
      - Fever, 102-104°F
      - Headache
      - Chills
      - Muscle aches
      - Diaphoresis
      - Anorexia
      - Joint stiffness
      - Fatigue
    - Malaise
    - Upper respiratory symptoms
    - Nonproductive cough
    - Sore throat, nasal congestion
    - Nausea, vomiting

- Other viral diseases
  - Influenza
    - Treatment
      - Supportive
      - Amantadine hydrochloride
      - Rimantadine hydrochloride
      - Oseltamivir phosphate
      - Zanamivir
    - Standard precautions

- Other viral diseases
  - Mononucleosis
    - Acute disease caused by Epstein-Barr virus (EBV)
    - Herpes family
    - Affects oropharynx, tonsils, lymphatic system
    - Extremely contagious
    - Spread by oropharyngeal secretions and saliva
Infectious Diseases (Cont’d)

- Other viral diseases
  - Mononucleosis
    - Findings
      - Fever
      - Sore throat
      - Oropharyngeal discharges
      - Lymphadenopathy of cervical lymph
      - Conjunctival hemorrhage
      - Splenomegaly

Infectious Diseases (Cont’d)

Conjunctival Hemorrhage

Infectious Diseases (Cont’d)

- Other viral diseases
  - Acute afebrile
    - Laryngitis, rhinitis, pharyngitis in upper respiratory tract
  - Croup, bronchitis, bronchiolitis in lower respiratory tract
Infectious Diseases (Cont’d)

- Other viral diseases
  - Acute febrile
    - Tonsillitis
    - Croup
    - Bronchiolitis
    - Bronchitis
    - Pharyngitis
    - Pneumonitis
  - Primary viruses responsible: parainfluenza viruses types 1, 2, 3 and RSV

Infectious Diseases (Cont’d)

- Sexually transmitted diseases
  - Quick recognition prevents complications, spread of disease
    - Sexual history
    - Number of partners
    - Gender of partners
    - Use of contraception
    - Menstrual history in women

Infectious Diseases (Cont’d)

- Sexually transmitted diseases
  - Syphilis
    - Caused by spirochete bacterium, Treponema pallidum
    - Starts as ulcer at site of inoculation
    - Untreated, progresses through secondary, latent, and tertiary stages
    - Transmission through sexual contact
    - Untreated during initial and secondary stages highly contagious
Infectious Diseases (Cont’d)

• Sexually transmitted diseases
  ➢ Syphilis
    ▪ Genital lesions
      ➢ Congenital syphilis occurs from transplacental infection of fetus
      ➢ Greatest risk during stages of heavy spirochtemia

Infectious Diseases (Cont’d)

• Sexually transmitted diseases
  ➢ Syphilis
    ▪ Incubation stage
      ➢ Averages 3 weeks
      ➢ Bacteria adheres to and penetrates epithelium
      ➢ As bacteria multiply, disseminate
      ➢ Asymptomatic

Infectious Diseases (Cont’d)

• Sexually transmitted diseases
  ➢ Syphilis
    ➢ Primary stage
      ▪ Chancre at site of inoculation
      ▪ Painless primary lesion with clean base and rounded, discrete borders, rubbery consistency
      ▪ Starts as small, red, hard papule that enlarges, breaks down, causes crater with encrusted surface
      ▪ Majority are genital
      ▪ Untreated, lasts 2-6 weeks
      ▪ Spontaneous resolution
Infectious Diseases (Cont’d)

• Sexually transmitted diseases
  ➢ Syphilis
    ✷ Secondary stage, secondary syphilis
    ✷ Fever
    ✷ Malaise
    ✷ Fatigue
    ✷ Anorexia
    ✷ Sore throat
    ✷ Rash encompasses entire body
    ✷ Can affect every organ system
    ✷ "The great imitator"

Infectious Diseases (Cont’d)

• Sexually transmitted diseases
  ➢ Syphilis
    ✷ Latent syphilis
      ➢ When lesions disappear
      ➢ 6 months to 8+ years
      ➢ Early latency <1 year
      ➢ If untreated, secondary relapse at 90% rate in first year, 95% within 2 years
      ➢ Asymptomatic

Infectious Diseases (Cont’d)

• Sexually transmitted diseases
  ➢ Syphilis
    ✷ Tertiary syphilis
      ➢ One of three outbreaks appears years to decades after infection
      ➢ Late benign
      ➢ Cardiovascular
      ➢ Neurosyphilis
      ➢ Tumors/gummas in mucous membranes, liver, skin, bone, cartilage
      ➢ Weakening of arterial walls, aortic aneurysm
      ➢ Damage to CNS, cranial nerves, dorsal roots of spinal cord
Infectious Diseases (Cont'd)

- Sexually transmitted diseases
  - Syphilis
    - Findings
      - Headaches
      - Seizures
      - Alterations in mental status
      - Cognitive impairment
      - Ataxia
      - Slurred speech
      - Destruction of optic nerve
      - Pupil restricts to accommodation, does not constrict to light
      - Penicillin for all stages

- Gonorrhea
  - Second most common
  - Caused by Neisseria gonorrhoeae
  - Can directly affect urethra, anal canal, pharynx, conjunctiva
  - Endometriosis
  - Salpingitis
  - Peritonitis
Sexually transmitted diseases
- Gonorrhea
  - Systemic complications
    - Arthritis
    - Dermatitis
    - Endocarditis
    - Meningitis

- Women
  - Most common site, cervix
  - Urethra
  - Anal canal
  - Pharynx
  - Soringitis, leads to ectopic pregnancy, infertility

- Men
  - Purulent urethral discharge

- Additional findings
  - Abnormal vaginal bleeding
  - Abdominal pelvic pain
  - Burning, painful urination
  - Can spread to eyes by rubbing eyes with infected fingers, can lead to blindness
  - Treatment
    - Ceftriaxone, 125 mg
Sexually transmitted diseases

Chlamydia

- Most common STD
- Complications
  - Salpingitis
  - Damage to uterus, fallopian tubes
  - Increased risk of ectopic pregnancy
  - Infertility in women
  - Epididymitis in men

Chlamydia

- Spread
  - Sexual activity
  - Sharing of contaminated clothing, wet towels
  - Hand-to-hand transmission from infected eye secretions
  - After infection no immunity is acquired

Sexually transmitted diseases

Chlamydia

- Most common site of infection
  - Adults: Urethra and endocervix
  - Children: Respiratory tract and conjunctiva
- Most common symptom
  - Men: Dysuria and discharge
  - Women: Asymptomatic, discharge
Sexually transmitted diseases

- **Chlamydia**
  - Conjunctivitis can lead to blindness
  - Treatment, antibiotics
    - Azithromycin
    - Doxycycline

Herpes

- HSV-1
  - 80% of the population is seropositive
  - Affects trigeminal ganglia
  - Outbreaks in oropharyngeal area
- HSV-2
  - Affects sacral ganglia
  - Outbreaks in genital area
Infectious Diseases (Cont’d)

- Sexually transmitted diseases
  - Herpes
    - After initial infection, enters latent nonreplicative state, reactivates
    - Emotional, physical stress
    - Trauma
    - Fever
    - Ultraviolet light exposure
    - Immunosuppression

Infectious Diseases (Cont’d)

- Sexually transmitted diseases
  - Herpes
    - Spread
      - Close personal contact
      - Can be spread in the absence of sores
    - Major portals
      - Broken skin
      - Mucous membranes

Infectious Diseases (Cont’d)

- Sexually transmitted diseases
  - Herpes
    - Newborns infected if mother has active lesions during delivery
    - Before herpetic sore development, prodrome of burning, itching
    - Systemic infection findings
      - Fever
      - Malaise
      - Headache
      - Confusion
      - Fatigue
Infectious Diseases (Cont'd)

- Sexually transmitted diseases
  - Herpes
    - Treatment: Acyclovir
    - Prevention: Avoid contact with infected secretions, PPE, avoid sexual contact, condoms, spermicides

Infectious Diseases (Cont’d)

- Scabies and lice
  - Scabies
    - Parasitic infestation of Sarcoptes scabiei, mite
    - Female mite invades upper layers of skin
    - Hypersensitivity reaction to mite’s protein and feces
    - Spread: Person-to-person contact, sexual contact, dirty linens of infected person within 24 hours

Infectious Diseases (Cont’d)

- Scabies & lice
  - Scabies
    - Men: lesions on finger webs, thighs, external genitalia, armpits, waist, anterior wrists
    - Females: lesions on nipples, abdomen, lower portion of buttocks
    - Infants: lesions on head, neck, palms of hands, soles of feet
Infectious Diseases (Cont’d)

Lice

- Infests head, body, pubic region
- Body lice involved in typhus, trench fever, relapsing fever
- Spread
  - Head lice: direct contact with person, item used on head
  - Body lice: direct contact, indirect contact with infested items
  - Pubic lice: sexual contact

Infectious Diseases (Cont’d)

- Scabies and lice
  - Lice
    - Leave febrile host, fevers and overcrowding favor transmission
    - Do not hatch <72°F
  - Three-stage life cycle
    - Eggs take 7-10 days to hatch
    - Nymph stage, 7-13 days
    - Egg to egg, 3 weeks
Infectious Diseases (Cont’d)

- Scabies and lice
  - Lice
    - Treatment
      - Topical medicines
      - Mechanical removal of all eggs, nymphs, adults from body
  - Standard precautions
    - Bag all linen separately
    - Spray inside of ambulance with insecticide known to be effective in killing lice, mites
    - Gloves at all times

Infectious Diseases (Cont’d)

- Scabies and lice
  - Lice
    - Prevention
      - Good personal hygiene
      - Wash clothing, linens in hot water

Infectious Diseases (Cont’d)

- Lyme disease
  - Tick or arthropod-borne disease
  - Caused by spirochete bacteria
  - Affects skin, CNS, cardiovascular system, joints
  - Ticks, vector of transmission
Infectious Diseases (Cont’d)

- Lyme disease
  - First stage
    - Localized reaction at bite site
    - Painless, warm rash
    - Flu-like symptoms
    - Fever
    - Chills
    - Headache
    - Malaise
    - Stiff neck
    - Myalgia

Infectious Diseases (Cont’d)

- Lyme disease
  - Second stage
    - Early disseminated stage
    - Pathogen invade skin, heart, nervous system, joints
    - Multiple lesions on skin
    - Seventh cranial nerve affected, causes Bell’s palsy
    - May involve brain, causing meningitis
    - Invade motor and sensory nerves, producing peripheral neuropathy

Infectious Diseases (Cont’d)

- Lyme disease
  - Second stage
    - Heart, causing AV blocks
    - Musculoskeletal pain
    - Sore throat
    - Dry cough
    - Fatigue
    - Lethargy
    - Sensitivity to light
Infectious Diseases (Cont'd)

- Lyme disease
  - Late stage
    - Recurrent arthritis affects large joints, knees
    - Depression
    - Sleep disorders
    - Cognitive deficits

Infectious Diseases (Cont'd)

- Lyme disease
  - Tick removal
    - Grasp as close as possible to skin surface with tweezers/forceps, pulled out
    - Do not crush, squeeze tick body
    - Wash site with soap and water, dress appropriately
    - Summer, fall peak season
    - Treat patient compartments with insecticide
Gastroenteritis
- Inflammation of stomach lining and intestinal tract
- **Causes**
  - Rotovirus
  - Norwalk virus
  - Enteric adenoviruses
  - Parasitic infections
  - Bacterial infections
  - Overgrowth of normal intestinal flora

**Transmission**
- Contaminated food, water
- Fecal-oral route

**Presentation**
- Abdominal pain, cramps
- Diarrhea
- Nausea, vomiting
- Fever
- Anorexia
- Frank shock

- **H. pylori**
  - Ulcers
  - Chronic gastritis
  - Heartburn

**Differential diagnosis**
- Salmonella spp. infection
- Botulism
- Appendicitis
- Inflammatory bowel disease
- Bowel obstruction
Exposures to Infectious and Communicable Diseases

- Exposure incident
  - When potentially infectious material comes in contact with eyes, nose, mouth, mucous membranes, nonintact skin

Exposures to Infectious and Communicable Diseases (Cont’d)

- Immediately report potential exposure
  - Allows for immediate medical screenings
  - Permits identification of possible infectious agents, proper treatment
  - Infection control officer

Exposures to Infectious and Communicable Diseases (Cont’d)

- Employers required by law to provide employees with appropriate medical care, treatment if exposed
- Vaccinations
- Employer report
Preventing Disease Transmission

- Do not report for duty:
  - Diarrhea
  - Draining wound, wet lesions
  - Body temperature >100.5°F
  - Positive mononucleosis status
  - Jaundice
  - Lice, scabies
  - Been taking antibiotics for less than 24 hours for strep throat

Preventing Disease Transmission (Cont'd)

- Immunizations up to date
  - MMR
  - Hepatitis B and A
  - DTP
  - Polio
  - Chickenpox
  - Influenza

Preventing Disease Transmission (Cont'd)

- Approach all patients with caution
- Control scene
- Standard precautions always
- Always be cautious of risks to self, patient, co-workers
Chapter Summary

- When treating patients with communicable diseases and infections, first protect your partner and yourself, then treat the patient while protecting the public from a widespread outbreak.
- PPE, staying up to date with inoculations against infections, important for patient care.

Chapter Summary (Cont’d)

- Transmission of infectious disease depends on virulence, correct mode of entry into the body, and the immune status of the host.
- Stages of infectious disease are the incubation period, window period, communicable period, latent period, and disease period.

Chapter Summary (Cont’d)

- Disease may be caused by bacterium, virus, fungus, protozoa, helminth, and prion.
- Body has multiple defense mechanisms, including skin, white blood cells, RES, and complement system.
- Detailed history and physical examination of the patient provide clues that an infectious disease may be present.
Chapter Summary (Cont’d)

- HIV has two strains, HIV-1 and HIV-2; both are communicable through unprotected sexual intercourse and contact with infected secretions and blood
- HIV is incurable, has no vaccination
- Hepatitis affects the liver; it is communicable sexually, by infected blood and secretions

Chapter Summary (Cont’d)

- Hepatitis has no cure; vaccinations are available for some strains
- Tuberculosis primarily affects the lungs but can affect other organs; it is spread through respiratory secretions from an infected person; it may be treated with antibiotics

Chapter Summary (Cont’d)

- Meningitis may be caused by many pathogens
  - Bacterial meningitis is caused by bacteria reaching the meninges through the blood