



Certified Pediatric Nurse Review Course: Infectious Diseases

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Introduction

Communicable Disease is the most common cause of illness in children. This section will review the circle of infection as well as the most common illnesses seen in children. The primary role of the nurse is prevention through infection control, education about immunization and early recognition of illness.

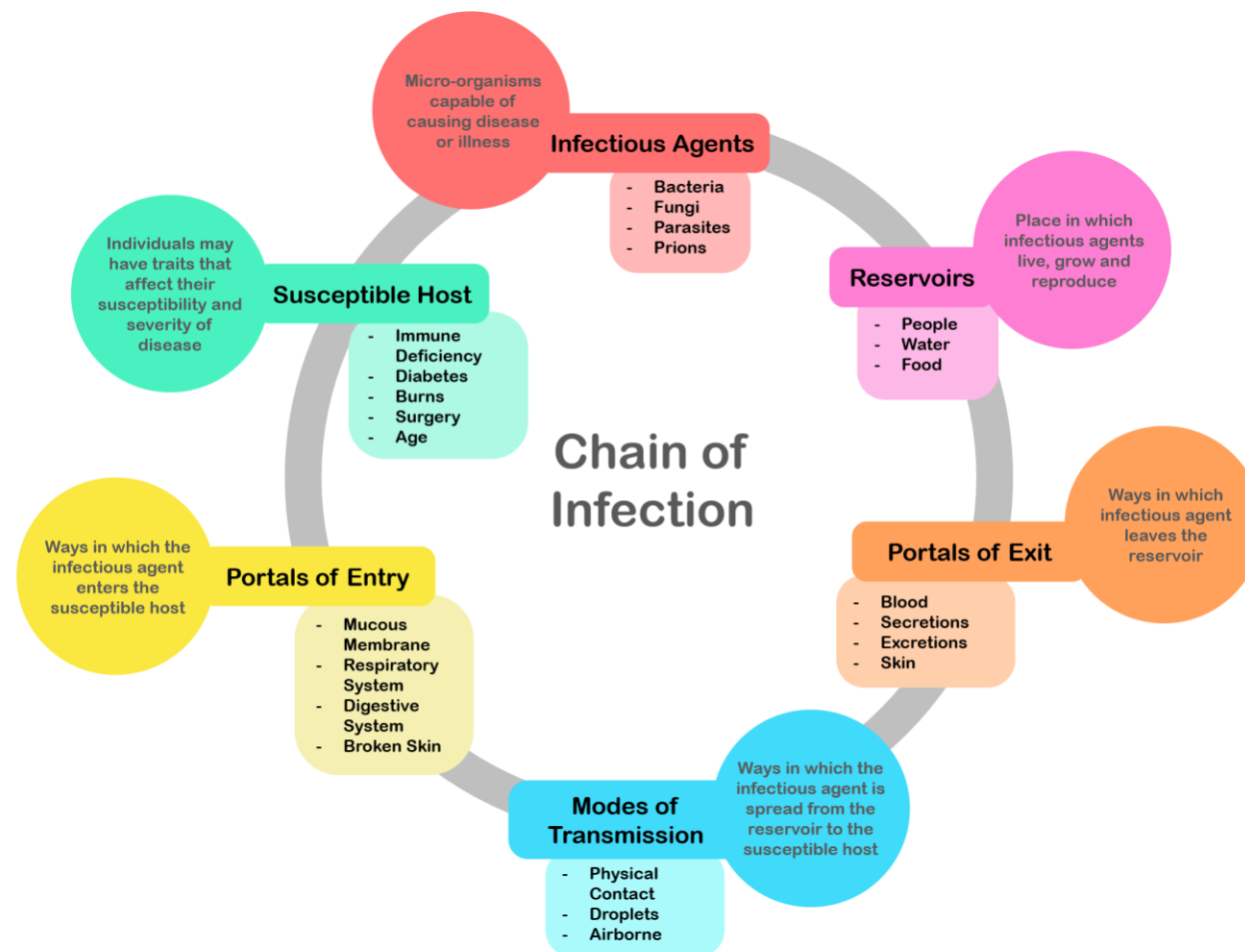
Objectives

- Describe the nurse's role on impacting the chain of infection.
- Discuss vaccine types and their major side effects.
- Identify the most common communicable childhood diseases that immunizations can prevent.

Circle of Infection

Is composed of 6 elements

1. Pathogen- i.e., viral, bacterial, fungal
2. Source- where the pathogen can live i.e. soil, skin, respiratory tract, surfaces
3. Portal of exit/ how does it leave its source- i.e., skin to skin, blood borne
4. Transport/Transmission- i.e., droplet, airborne, contact
5. Portal of entry- i.e., mouth, cut, eyes, urinary tract, respiratory tract
6. Susceptibility of host- health and age of the person exposed



Infection Prevention Strategies

- Transmission Based Precautions
 - Droplet
 - Airborne
 - Contact
- Proper PPE
- Infection Control Standards
 - Hand Hygiene
 - Environmental Controls
 - Respiratory Etiquette
 - Safe Needle Usage



Common Pediatric Illnesses

Neonate Fevers/ Fever of Unknown Origin

- Fever is a normal body response to foreign organisms
 - 100.4 – 101 F(38- 38.5C) are considered safe to leave untreated
- Any fever in an infant less than 3 months old is a medical emergency due to risk of neonatal sepsis
- Rectal temperature is most accurate for child <3 years of age
- Oral temperature for children >4

Treatment

- Antipyretic agents *
- Assess immunization status
- Assess hydration

Vaccine vs Non-Vaccine Infections

Four Categories of Illness not covered by Vaccines

- Bacterial
- Parasitic
- Vector borne
- Viral

Vaccine Mediated Illnesses

- Diphtheria
- Tetanus
- Meningococcal
- Pneumococcal
- Human Papilloma
- Measles
- Mumps
- Rubella
- Rotavirus
- Varicella
- Polio
- Hepatitis

Bacterial Illnesses

Group A and Group B Beta Hemolytic Streptococci

- **Group A-**
 - Pharyngitis most common (Strep Throat)
 - Untreated may lead to rheumatic fever
- **Group B-**
 - May be carries asymptotomatically in gastrointestinal and genitourinary tracts
 - Pregnant mothers are screened prior to deliver to decrease risk of sepsis in the neonate

Bacterial Illnesses- part 2

- **Methicillin Resistant Staphylococcus Aureus (MRSA)**

- Most commonly seen on the skin
 - Papule is red, leaks fluid, swollen and often painful
 - Firm, warm to touch
 - Bump that will not heal
- Is not easily treated with common staph antibiotics



- **Mycobacterium Tuberculosis (TB)**

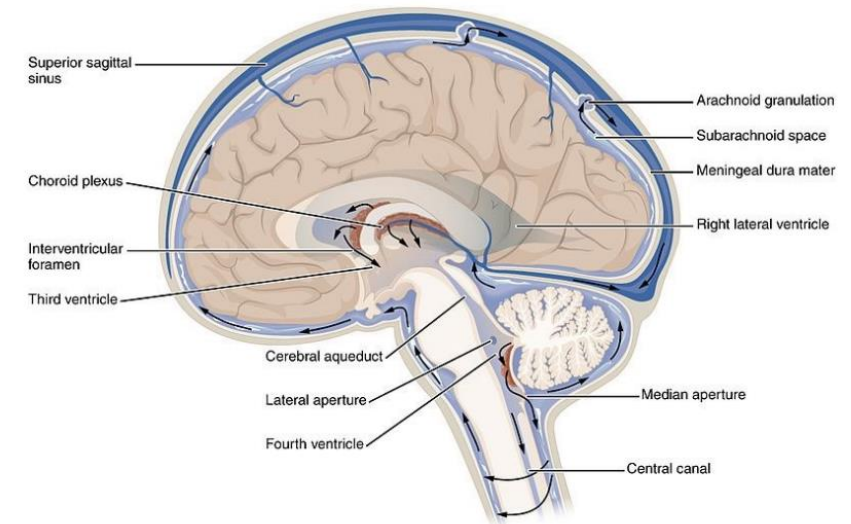
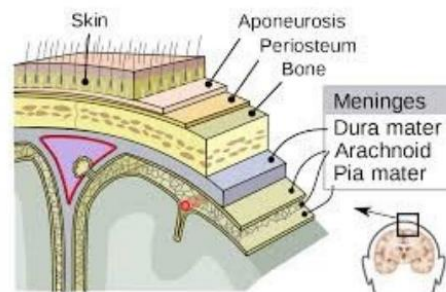
- Globally leading cause of death from a single infectious disease agent
- Assess for risk/exposure
- Symptoms include fever, fatigue, anorexia, weight loss, persistent cough, chest tightness/pain
- Diagnosed with TST testing induration appears within 24 hours and chest radiography

Meningitis

- May be from a bacterial or a viral antigen
- Inflammation of meninges causing
 - High risk for seizures
 - Increased intracranial pressure (ICP) seen with change in level of consciousness, vomiting, irritability, poor feeds, bulging fontanel, high pitched cry

Treatment

- Isolation
- Antibiotics
- Seizure precautions



Parasitic Illnesses

Salmonella

- Passed person to person or via undercooked meats, poultry
- Passed via pets (turtles, amphibians most often)

Giardia lamblia

- Protozoan passed person to person or via contaminated water
- Nonmotile stage can last for months

Enterobiasis (Pinworm)

- Ingestion or inhalation of parasites eggs that migrate through intestinal tract and hatch on rectal mucosa

Diagnosis via stool cultures or swabs; Treat symptoms and supportive care with hydration and antibiotics

Vector Borne Illnesses

Lyme Disease



Lyme Disease-

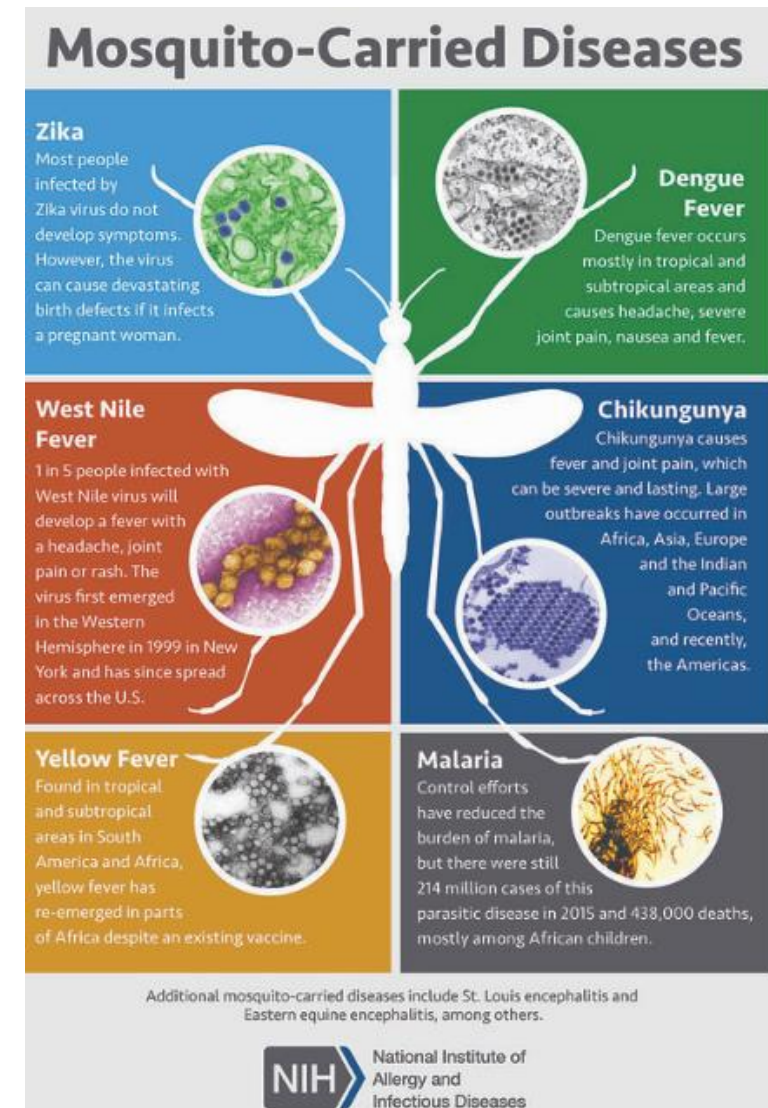
- Most common tick-borne illness most focused in the Northeast section of the US
- 3 stages following the bite
 - 3- 31 days note erythema at site; often with bulls eye rash
 - Beginning of systemic symptomology appears in this time period
 - Late/chronic signs of musculoskeletal pain, arthritis, pain
- Nursing is key to prevention
 - Awareness
 - Use of 30 % or less DEET agents

Vector Borne Illnesses

Mosquito Borne Diseases

- Zika most prevalent in the US
- Minimal to no symptoms
- High risk of neonatal birth defects

Ref NIH





Viral Exanthems



Coxsackie Disease

- Member of the enterovirus family of viruses, lives in the GI tract
 - Often cause of Hand Foot and Mouth Disease
 - Very contagious from onset rash until rash resolves
 - Macular and/or vesicular rash seen on the hands, feet and in and/or around mouth

Erythema Infectiosum (Fifth Disease)

- Appears as a lacey looking flat macular rash
- Often called “slapped face” for the appearance on cheeks
- Rash may be on extremities also
- Treatment is supportive of symptoms



Infectious Mononucleosis

- A rash is not always associated with viral Mononucleosis
- May also be seen with Ampicillin treatment for infections in children
- Flat maculopapular rash on all extremities and trunk
- Resolves usually in a few days to a week



Roseola

- Common viral rash in children 6 months – 3 years old
- Generalized rash with fever and malaise
- Remains contagious for 24-48 hours after fever resolution



Scalded Skin Syndrome

- Skin infection caused by certain strains of Staph Aureus that produces patches of skin that appears scalded or burned and sloughs off
- Usually resolves quickly after antibiotic treatment is started
- Skin may peel for up to 2 weeks after



Immunity

- Immunity is developed in many ways
 - **Passive Immunity** comes from an infant's mother and is short term
 - **Active Immunity** occurs after exposure when a child's immune system mounts as response
 - This can come from exposure to a pathogen
 - This can come from Immunization
 - **Immunologic Memory** is persistent protection from an illness from a vaccine given per dosage instructions based on the specific vaccine

Vaccinations

Live Attenuated

- Derived from live viruses that are weakened in the lab usually through repeated replication
- i.e., MMR; Rotavirus; Varicella

Inactive

- Cannot replicate
- i.e., Influenza; HPV; Hepatitis A,B; Polio; COVID

Recombinant

- Created through genetic engineering

Nursing considerations with all vaccinations is to perform screening for contraindications, use of VIS sheets to inform patients of risks/benefits.

Knowledge Check Questions



Knowledge Check 1

While assessing an infant you note a rectal temperature of 102F (38.9 C). What are the best next steps of nursing action to take?

- A. Recheck with a glass thermometer
- B. Request an order for Aspirin as an antipyretic medication
- C. Assess the hydration and nutritional status of the patient
- D. Apply ice to axilla, neck and thorax

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Knowledge Check 2

When treating a patient with a parasitic infection what are the priority nursing considerations?

- A. Begin Antibiotics as soon as possible
- B. Educate Family on high risk of communication of the disease
- C. Isolate patient to prevent spread of disease
- D. Provide comfort measures for any discomfort from illness

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Knowledge Check 3

When educating a family about how vaccines work which term applies to the mechanism of action?

- A Passive
- B Active
- C Adjuvant
- D Incubation

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Knowledge Check 4

A parent calls to report their 18-month-old has a fine rash over their whole body. In reviewing the history, it is noted they received an MMR vaccine within the past 7 days. What advise should be given to the parent?

- A. Advise parent to force hydration into the child and call back if it is not better in a few days or if it becomes worse
- B. Advise parent the child has the measles and should be kept out of day care
- C. Advise the parent it is a common side effect from the MMR vaccine at call back if the child becomes worse or it does not improve over the next 7-10 days.

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Knowledge Check 5

When educating a parent on TDaP immunization what statement below alerts the nurse that more education is needed?

- A. “This will protect my child from tetanus”
- B. “I know that my child may have a mild fever or be fussy today after the vaccine”
- C. “I can give Tylenol to my child today and I should make sure they drink well “
- D. “I heard this causes autism”

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References

1. Fitzgerald, M., & Jack, D. (2023). *Pediatric nurse certification review*. Springer Publishing.
2. Centers for Disease Control and Prevention. (2022, April 28). *Chain of Infection Components*. Centers for Disease Control and Prevention.
3. Wikimedia commons. (2017, November 14). Chain of Infection.png.
4. Louise Jakubik, & Janice Selekman. (2023). *Pediatric Nursing Certification Review* (5th ed.). Society of Pediatric Nurses.
5. Wikimedia commons. MRSA cutaneous abscess
6. Gresham. (n.d.-a). https://www.gresham.ac.uk/sites/default/files/2019-10-30_ChristopherWhitty-Infection-PP.pdf
7. Wikimedia commons. Fifth disease
8. Wikimedia commons. Roseola
9. NZ, D., & Langeland, T. (n.d.). *Staphylococcal scalded skin syndrome*. Store medisinske leksikon. https://sml.snl.no/staphylococcal_scalded_skin_syndrome