

Hepatitis

OCCC Nursing Program
NUR 143
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Program Description

- ▶ This unit will focus on the pathophysiology, clinical manifestations, diagnostic testing and treatment for the various forms of hepatitis.
- ▶ The nurse's role as a member of the interdisciplinary team, in treating clients with hepatitis will also be discussed.

Program Objectives

- ▶ Describe the pathophysiology and clinical manifestations of hepatitis.
- ▶ List factors predisposing to hepatitis.
- ▶ Identify important assessment data to be collected on patients with hepatitis.
- ▶ Relate the abnormal assessment, lab and diagnostic findings to the pathophysiology of the disorder.
- ▶ Identify common treatment modalities for this disorder.
- ▶ Identify common complications of hepatitis.
- ▶ Identify important aspects of health promotion regarding hepatitis.
- ▶ Identify the action, reaction/side effects and nursing implications of drugs used to treat this disorder.
- ▶ Identify the nutritional considerations for a patient with these disorders.
- ▶ Explain the multidisciplinary including nursing care across the lifespan for a patient with hepatitis.
- ▶ Utilize the nursing process to manage the care for a patient with hepatitis

Agenda

1. Description

2. Etiology

3. Pathophysiology

4. Manifestation & Complications

5. Collaborative Care

Function of the Liver ~ A Review

- ▶ The liver is essential for life.
- ▶ It functions in the manufacture, storage, transportation, and excretion of substances involved in metabolism
- ▶ Major functions:
 - Bile Synthesis
 - Bile production ~
 - formation of bile, containing bile salts, bile pigments, and cholesterol
 - Bile excretion ~
 - bile excretion by liver, about 1L/day

Liver Function

Metabolic Functions

- ▣ Carbohydrate metabolism ~
 - Glycogenesis: glucose to glycogen
 - Glycogenolysis: breaking down glycogen to glucose
 - Glyconeogenesis: formation of glucose from amino & fatty acids
- ▣ Fat metabolism ~
 - Lipoprotein synthesis
 - Triglyceride breakdown into fatty acids & glycerol, formation of ketone bodies
 - Fatty acids synthesis from amino acids & glucose
 - Cholesterol synthesis and breakdown

Liver Function

□ Protein metabolism

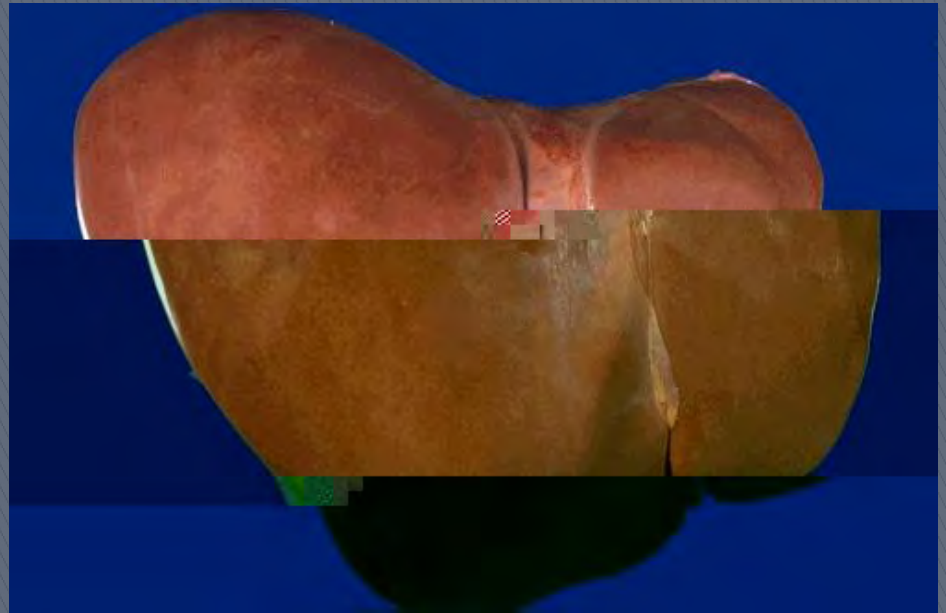
- Synthesis of clotting factors
- Synthesis of nonessential amino acids
- Synthesis of plasma proteins
- Urea formation

□ Detoxification

- Inactivation of drugs and harmful substances, excretion of their breakdown products

○ Storage

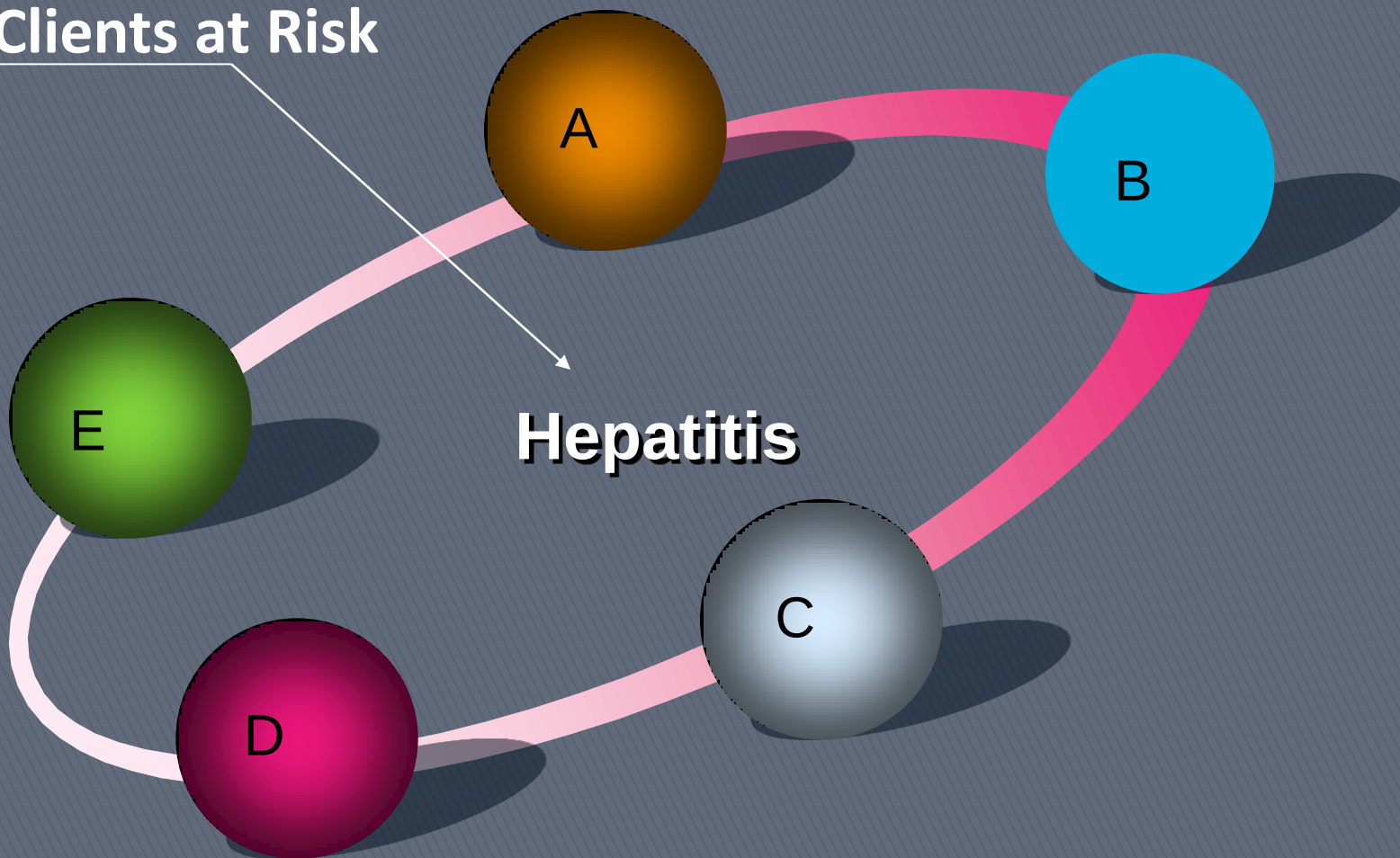
- Glycogen
- Vitamins: fat (A,D,E,K) & water soluble (B1, B2, B12, Folic acid)
- Fatty acids, minerals (iron)
- Amino acids
 - albumin, globulins



Hepatitis

- An acute or chronic inflammation of the liver caused by a
 - virus
 - bacteria
 - exposure to drugs or hepatotoxins
- The goals of treatment include
 - resting the inflamed liver to reduce metabolic demands
 - increase the blood supply
 - thus promoting cellular regeneration
 - preventing complications

Our Clients at Risk



Etiology

- ▶ Viral Hepatitis: 6 major viruses A, B, C, D, E, G
- ▶ Other: bacteria, hepatotoxic agents
- ▶ Viruses are spread via oral /fecal route, blood, blood products, needle sticks, sexual contact, perinatal contact
- ▶ Presence of antigens and development of antibodies define the specific hepatitis virus

Who has Hepatitis?



Pathophysiology

Inflammation

Necrosis

Regeneration

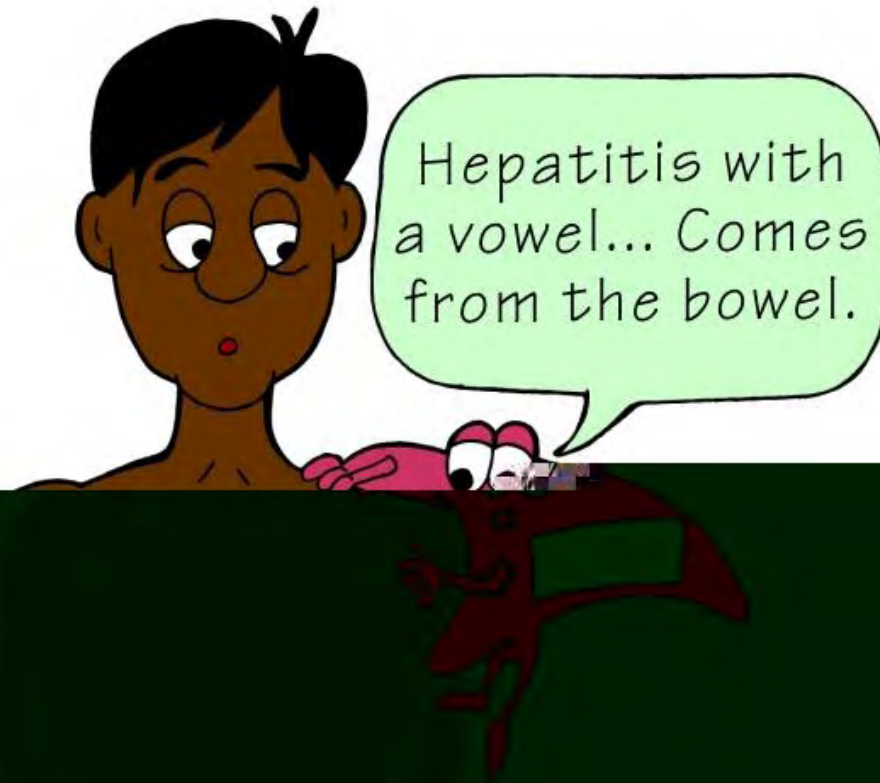


Laboratory Results

- ▶ ALT: Elevated to more than 1000 mU/mL and may rise to as high as 4000 mU/mL
 - Normal adult blood value: 6 to 24 U/L depending on age
- ▶ AST: May rise to 1000 to 2000 U/mL
 - Normal adult blood value: 8 to 26 U/L depending on age with highest normal value in the newborn

Laboratory Results

- ▶ Alkaline Phosphate Levels
 - May be normal or mildly elevated
 - Normal: 30 to 90 IU/L or 4.5 to 13 King-Armstrong units/dL depending on age
- ▶ Serum Total Bilirubin Levels
 - Elevated to greater than 2.5 mg/dL
 - Normal: 0.3-1.0 mg/dL (less than 1.5 mg/dL)
 - Elevated levels of bilirubin in the urine



Clinical Manifestations

Preicteric Stage

The first stage of hepatitis preceding the appearance of jaundice

- Flu like symptoms

- Fatigue
- Malaise
- Headache
- Lethargy
- Increased temperature

➤ GI Related Signs and Symptoms

- Anorexia
- Nausea and vomiting
- RUQ Abdominal tenderness
- Diarrhea or constipation
- Weight loss

➤ Joint pain

➤ Elevated AST, ALT, and bilirubin

Icteric Stage

- The second stage of hepatitis
 - Which includes the appearance of
 - Elevated bilirubin levels
 - Tea-brown colored urine
 - Clay-colored stools
 - Jaundice
 - Pruritus
 - Enlarged and tender liver
 - Decrease in pre-icteric symptoms, including:
 - Appetite improves, no fever

Posticteric Stage

The convalescent stage in which the jaundice decreases and or resolves:

- ▶ Stool and urine color returns to normal
- ▶ Absence of clay-colored stools is an indication of resolution
- ▶ Serum bilirubin and enzymes return to normal levels
- ▶ Improved well-being
- ▶ Gastrointestinal: minimal to absent
- ▶ Liver remains enlarged
- ▶ Convalescence 2 - 4 months

BOX 21-7

MANIFESTATIONS OF ACUTE VIRAL HEPATITIS

Preicteric or Prodromal Phase

- “Flu-like” symptoms: malaise, fatigue, headache, muscle aches, nasal discharge, sore throat.
- Gastrointestinal: anorexia, nausea, vomiting, diarrhea, or constipation.
- Joint pain.
- Mild and constant right upper abdominal pain.

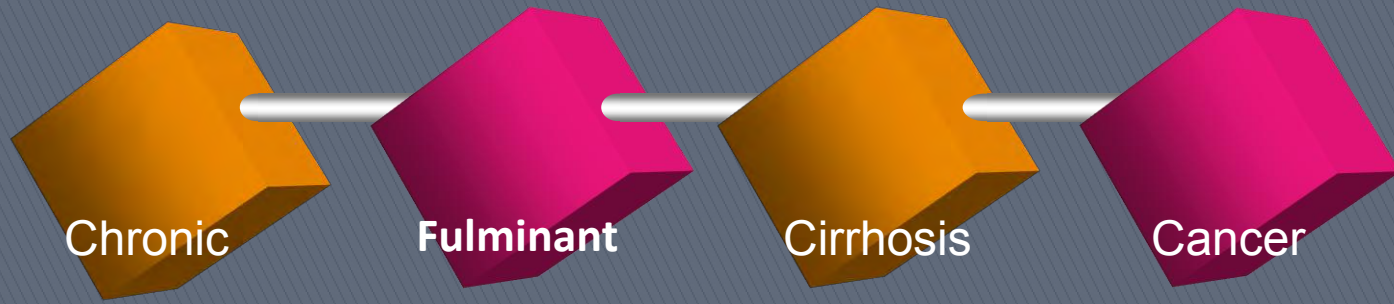
Icteric Phase

- Jaundice.
- Pruritus.
- Clay-colored stools, dark urine.

Posticteric or Convalescent Phase

- Well-being improves, energy increases.
- Jaundice resolves.

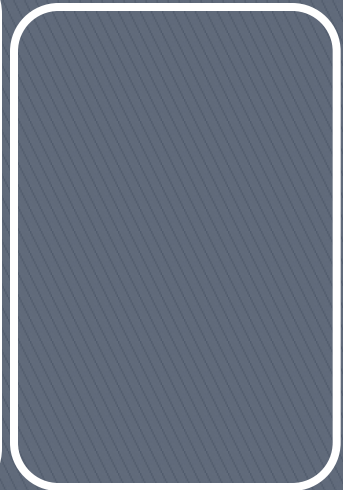
Complications ~ Hepatitis



Failure of the immune system.
Continue to carry the virus.
HBV, HCV
LFT's elevated
> 6mths

Severe liver impairment
necrosis & liver failure
HBV, HDV

Post necrotic
Cirrhosis,
predisposes client to
hepatoma



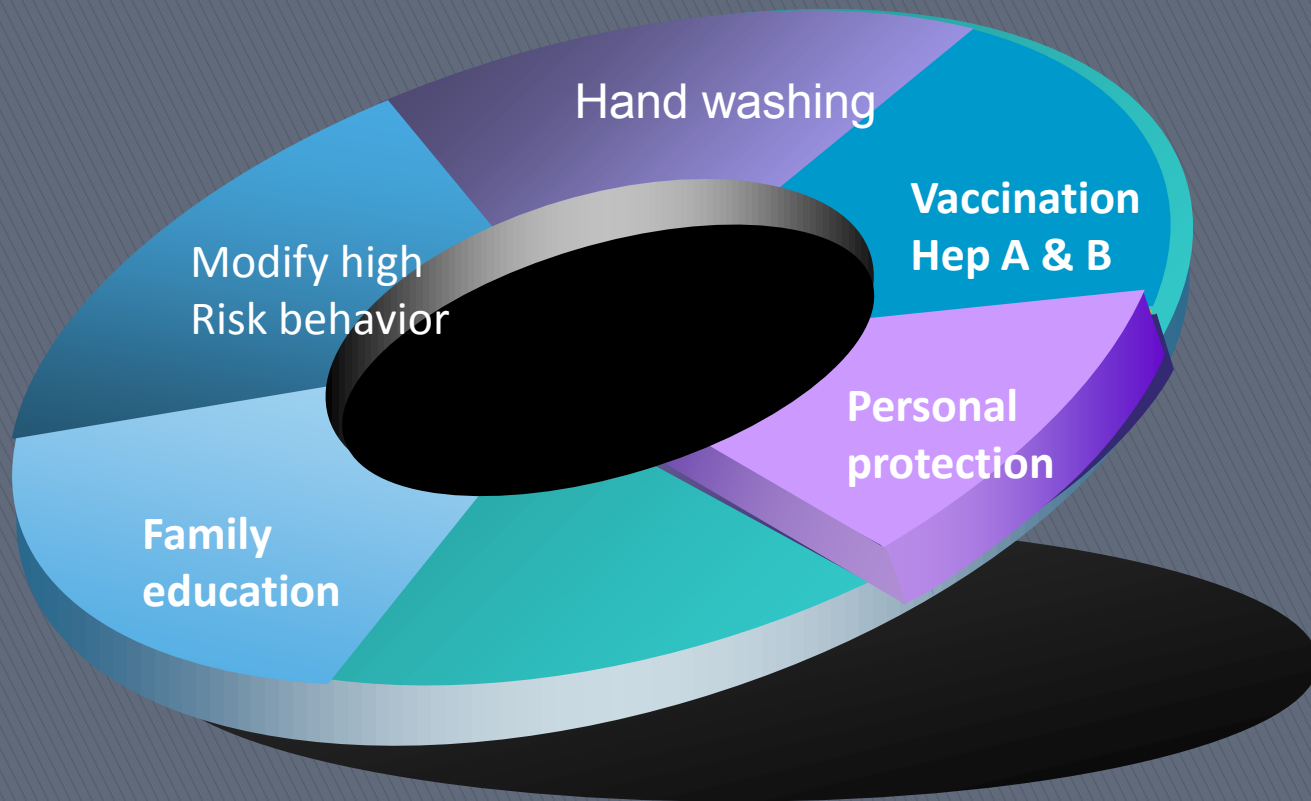
Diagnosis

- ▶ Physical assessment
 - Hepatic tenderness
 - Hepatomegaly
 - Splenomegaly
- ▶ Liver biopsy
 - Histologic exam in chronic hepatitis
- Liver function tests

Treatment

- Rest
- Nutrition
 - Increase fluids, no ETOH/drugs detoxified by liver
 - Low fat, high protein/carbohydrate diet
- Medications
 - Acute
 - supportive therapy, symptom management
 - Antiemetics (no phenothiazines)

Prevention



Vaccines and Post Exposure Prophylaxis

- Hepatitis A: Havrix, Vaqta immunity times 10 years (95%) Vaccine: pre exposure,
 - Administration times one and then 6–12 months
 - Immune globulin (IG) before or after exposure
 - 1–2 months passive immunity
- Hepatitis B: enerix–B, Recombivax–HB
 - Life long immunity in absence of immunosuppression
 - Times three: first then 1 month then 6 months
 - Postexposure: Hep B Immun globulin: within 24 hours to seven days of exposure and second dose with 30 days of first dose
- Hepatitis A/B:: Twinrix x3 doses: initial dose followed at 4 weeks and 6 months

Treatment

- Hepatitis B ~chronic
 - Short term goal
 - decrease
 - viral load, AST & ALT levels
 - rate of disease progression
 - rate of drug resistant HBV
 - *Long term goal:* prevention of cirrhosis and liver cancer
 - Interferon alpha (SQ) or (IM)
 - Drug blocks viral entry into cells, synthesis of viral proteins and viral assemble and release, reduces viral load
 - Response 1/3 have significant response
- Adefovir (Hespera), Lamivudine (Epivir) po
 - Used with active viral replication
 - Inhibit DNA synthesis for chronic Hep B therapy
 - By reducing liver inflammation and fibrosis, clients may become resistant to the drug

Treatment

► Medications

◦ Chronic Hepatitis C

- Therapy Goal: eradicating the virus, reduce viral load, decrease progression of the disease
- Interferon alpha
 - (SQ, IM)
 - Long acting anti viral effect, more active in inhibiting HCV
- Ribavirin (PO)
 - (Rebetol, Virazole)
 - Synergistic affect with interferon
 - May cause anemia
 - Significantly alters serotonin levels
 - Birth defects

Assessing Clients with Hepatitis

SUBJECTIVE DATA

- Known or possible exposure to hepatitis virus: recent travel; close contact with someone who has hepatitis; a high-risk occupation or behaviors; eating where a food handler has been diagnosed with hepatitis; injection drug use.
- Recent flulike illness.
- Anorexia, nausea, vomiting; change in bowel habits; color of feces and urine.
- Pain: location and character, frequency and timing, aggravating factors.
- Change in color of skin or sclera; itching.
- History of hepatitis vaccine or prophylaxis.

OBJECTIVE DATA

- Observe:
 - General appearance; apparent nutritional status
 - Color of skin and sclera, presence of jaundice
 - Color and consistency of feces; color of urine.
- Inspect abdomen for distention.
- Auscultate bowel sounds.
- Palpate abdomen for tenderness.

LABORATORY DATA

- Monitor serum bilirubin and liver function tests (see Chapter 18 ).

Types of Viral Hepatitis

Hepatitis A (HAV): Infectious

- ▶ Often seen in sporadic attacks or mild epidemics
- ▶ Is most prevalent in areas of poverty and areas with poor sanitation
- ▶ Increased risk
 - Contact with infected materials
 - Handling contaminated feces
 - Eating or drinking contaminated water, milk, or food
 - Eating raw fish from contaminated water
- ▶ Incubation period is
 - 2 to 6 weeks
- ▶ Infectious period is 2 to 3 weeks prior to, and 1 week after developing jaundice
- ▶ Symptoms last up to two months

Testing

- Infection is established by the presence of hepatitis A virus (HAV) antibodies (anti-HAV) in the blood
- IgM and IgG are normally present in the blood and increased levels indicate infection and inflammation
- Ongoing inflammation of the liver is evidenced by the presence of elevated immunoglobulin M (IgM) antibodies, which persist in the blood for 4 to 6 weeks
- Previous infection is indicated by the presence of elevated immunoglobulin G (IgG) antibodies

Prevention

- ▶ Good hand washing
- ▶ Stool and needle precautions
- ▶ Treatment of municipal water supplies
- ▶ Serologic screening of food handlers
- ▶ Passive immunization:
 - Pre & postexposure prophylaxis of immune globulin (IG)
 - Immune globulin (IG) is not administered postexposure if clinical manifestations have developed
 - Clients who live in or visit high risk areas can be protected for up to 3 months following the administration of immune globulin (IG)

Treatment

- Prevention of the spread of infection
- Instruct on good handwashing
- Instruct to thoroughly disinfect diaper-changing surfaces with a solution of $\frac{1}{4}$ cup bleach to a gallon of water
- Provide enteric precautions for at least 1 week after the onset of jaundice with HAV
- Maintain comfort and provide adequate rest and sleep
- Provide a low-fat, balanced diet
- Instruct the parents that because hepatitis A is not infectious within 1 week after the onset of jaundice, the child may return to schools at that time if feeling well enough
- Instruct parents that jaundice may get worse before it resolves
- Instruct parents in the signs indicating a worsening of the child's condition such as changes in the neurological status,

Hepatitis B (HBV) Transmission

- Formerly called serum hepatitis
- Prevalence increases in areas of overpopulation and poor hygiene
- About 5% of Hepatitis B patient's develop Chronic Liver Disease

Clinical Manifestations

- ▶ Anorexia, abdominal discomfort, vomiting and jaundice

- Blood or body fluid contact
- Infected blood and blood products
- Infected saliva or semen
- Contaminated needles and equipment
- Oral or sexual contact
- Parenteral
- Perinatal period
- Blood or body fluid contact at birth or during early childhood

Increased-Risk Individuals

- Those who receive multiple blood transfusions
- Health care providers in contact with blood and blood products
- Hemodialysis clients
- Sexually active individuals with multiple partners
- Morticians
- Those undergoing tattooing
- Parenteral drug abusers

Testing

- Presence of hepatitis B surface antigens (HBsAG) is the serologic marker to establish the diagnosis of hepatitis B
- ▶ The client is considered infectious if these antigens are present in the blood
- ▶ If the serologic marker (HBsAG) is present after 6 months or longer, it indicates a carrier state or chronic hepatitis B episode
- Normally the serologic marker (HBsAG) level declines and disappears after the acute hepatitis B episode
- The presence of antibodies to HBsAG (anti-HBS) indicates recovery and immunity to hepatitis B

Passive Immunization

- ▶ Hepatitis B Vaccine: involves three doses
 - an initial dose
 - a dose at 1-2 months
 - a dose at 2-6 months (infants at approximately 12 months)
- The recombinant vaccine produces antibodies to the surface antigen in 90-95% of recipients
- Some protection after the first injection
- ▶ Hepatitis B immune Globulin: may be given for postexposure prophylaxis when there has been percutaneous exposure to blood that contains HBsAG or by sexual contact
 - Within 1-2 days of exposure
 - Second dose 28-30 days after exposure

Hepatitis C (HVC)

- ▶ Is common among those who abuse IV drugs and is the major cause of post-transfusion hepatitis
- ▶ Risk factors are similar to HBV because Hepatitis C is also parenterally transmitted
- ▶ Hepatitis C has been treated with Interferon-alpha, which boosts the body's immune system

Transmission

- Same as HBV
- Infected blood and blood products
- Infected saliva or semen
- Contaminated needles and equipment
- Personal contact
- Possibly by fecal-oral route
- Parenteral
- Diagnosis is a problem in patient's who cannot produce anti-HCV because they immune-suppressed
- Also difficult to diagnose who have another form of liver disease such as due to alcoholism

Hepatitis D (Delta Agent Hepatitis, HDV)

- Common in the Mediterranean and Middle Eastern areas
- Only causes infections in the presence of active HBV infection
- Co-infection with the delta agent intensifies the acute symptoms of hepatitis B
- Transmission and risk of infection is the same as HBV, via contact with blood and blood products
- Prevention of HBV infection also prevents HDV infection, since HDV is dependent on HBV for replication

Hepatitis D (Delta Agent Hepatitis, HDV)

Transmission

- Infected saliva or semen
- Parenteral
- Contaminated needles and equipment
- Oral or sexual contact
- Blood and blood products among persons already infected with HBV
- Perinatal period

Hepatitis E (Enterically Transmitted)

- A water-borne virus
- Prevalent in areas where sewage disposal is inadequate or where communal bathing in contaminated rivers is practiced
- Risk of infection is the same as HAV
- Presents as a mild disease except in infected women in the third trimester of pregnancy, with whom the mortality rate is high

Transmission

- Same as HAV
- Fecal-oral route
- Person-to-person contact
- Eating contaminated uncooked shellfish, fruits, and vegetables
- Drinking contaminated water and milk
- Poorly washed utensils
- Parenteral

Treatment

- ▶ Focused on resting the liver
- ▶ Modify the client's diet so that less bile is needed
- ▶ Vitamin B to help client absorb fat soluble vitamins
- ▶ Vitamin K because of prolonged clotting times
- ▶ Avoid sedatives
- ▶ Avoid alcohol for at least one year or longer

HEPATITIS

AE

Hepatitis with
a vowel comes
from the bowel.

Transmission: Fecal, Oral



Vaccine-A
Yes



Vaccine-E
No

SS: (All Types)

RUQ Discomfort
GI-N/V
Anorexia
Weight Loss
Fever
Chills
Jaundice
Dark Urine
History of potential
exposure

©MILLER

C

Hepatitis C
(HCV)
Circulation

Transmission: Blood, Semen



Vaccine-C
No

B

Hepatitis B
Body fluids

Transmission: Blood,
Semen,
Saliva



Vaccine-B
Yes

TX: (All Types)

Rest
Activity as tolerated
Nutrition
Hydration

DX: Presence of
specific antibody /
antigen in serum

D

Hepatitis D
Super infection
with HBV

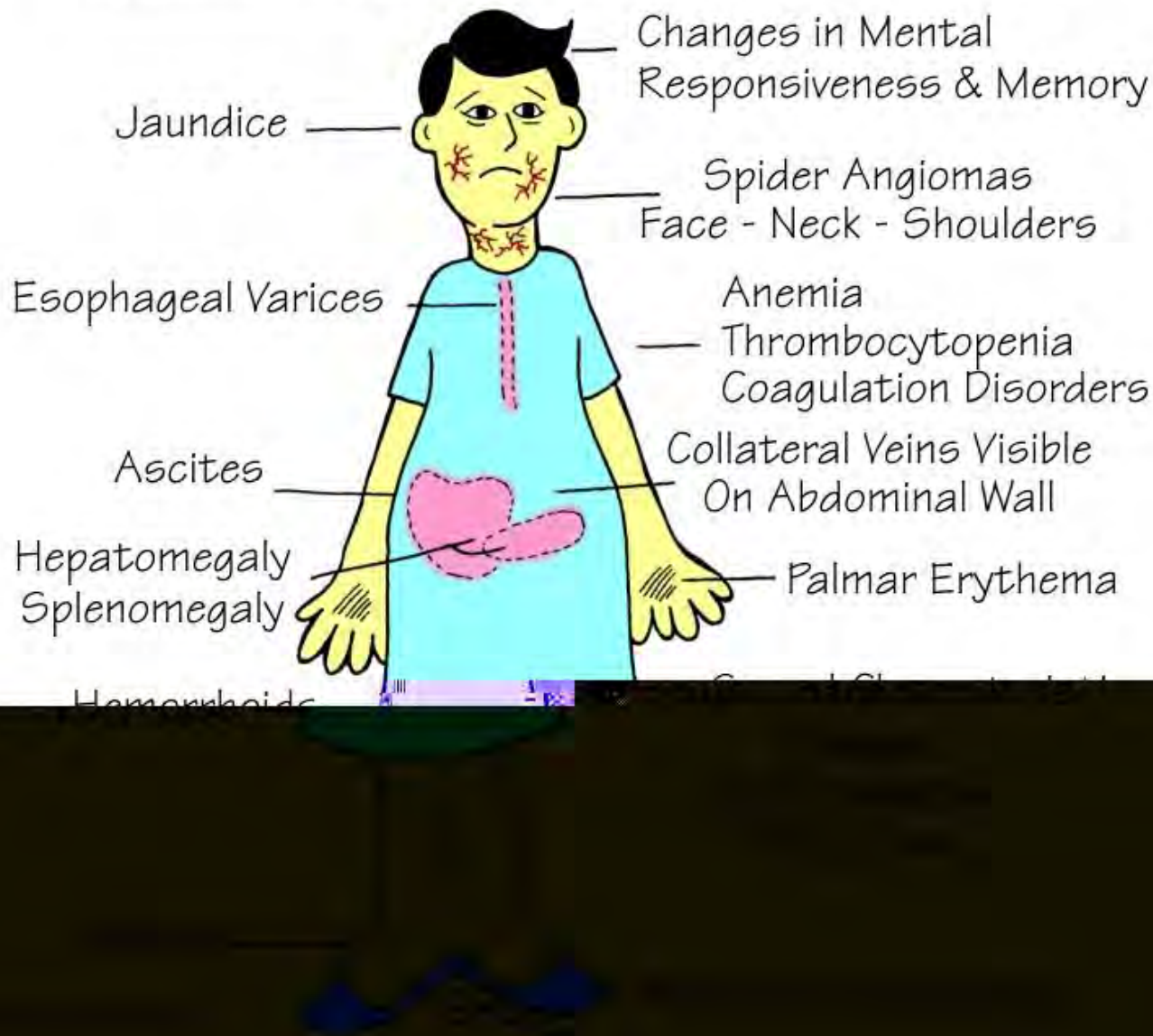
Transmission: Blood



Vaccine-D
No



CIRRHOSIS: LATER CLINICAL MANIFESTATIONS



Lactulose

You have portal hypertension.
Your liver is not working right.
Here is some lactulose to help flush out
the ammonia in your intestinal tract.



A family member of a patient asks the nurse about the protein-restricted diet ordered because of advanced liver disease with hepatic encephalopathy.

What statement by the nurse would best explain the purpose of the diet?

- a. "The liver cannot rid the body of ammonia that is made by the breakdown of protein in the digestive system."
- b. "The liver heals better with a high-carbohydrate diet rather than with a diet high in protein."
- c. "Most people have too much protein in their diets. The amount in this diet is better for liver healing."
- d. "Because of portal hypertension, the blood flows around the liver, and ammonia made from protein collects in the brain causing hallucinations."

Which of the following type of hepatitis is involved when there is an epidemic outbreak of hepatitis?

- a. Hepatitis A
- b. Hepatitis B (HBV)
- c. Hepatitis C (HCV)
- d. Hepatitis Delta Virus (HDV)

The spouse or partner of a client who has been diagnosed with hepatitis B wants to know how it is transmitted or spread.

The nurse in teaching about the transmission of Hepatitis B will inform the spouse or partner of which of the following modes of transmission

- a. Hepatitis B is spread by contaminated food, water, or shellfish through the fecal-oral route.
- b. This disease is only spread through contaminated blood transfusions or contaminated needles.
- c. This is an airborne viral disease carried in droplet nuclei.
- d. Hepatitis B is transmitted through any of the body fluids.

One of the major goals when caring for a client with acute viral hepatitis is preventing the spread of infection.

For a client with hepatitis the nurse will take which of the following actions to prevent the spread of infection?

- a. standard precautions and contact isolation if diarrhea present
- b. airborne precautions
- c. special goggles and double gloving to prevent contact with blood
- d. hand washing alone