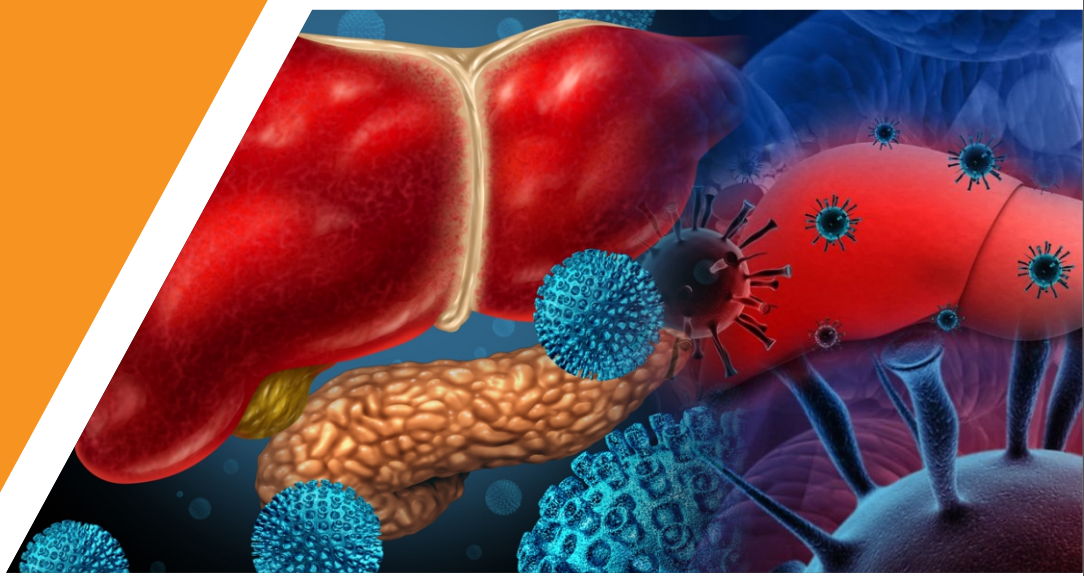
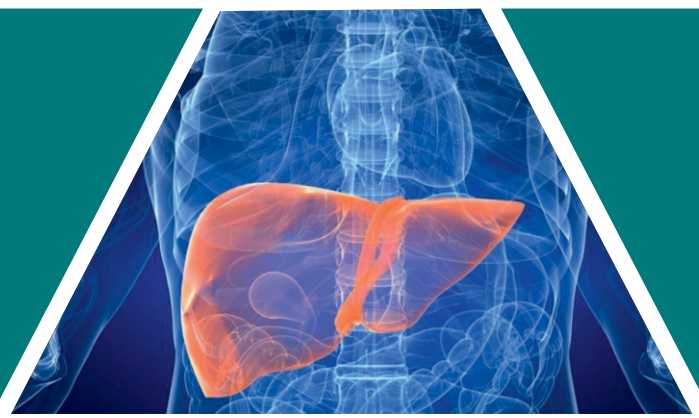
ilbs

PROJECT PRAKASH

PRogrammed Approach to Knowledge and Sensitization on Hepatitis





TRAINING MODULE FOR NURSES ON VIRAL HEPATITIS

PROJECT PRAKASH

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TRAINING MODULE

FOR NURSES

ON

VIRAL HEPATITIS

TABLE OF CONTENT

PREFACE

Liver diseases are increasing and the full impact has not yet been felt; it was once a minority killer; however liver diseases are now becoming common and are the fifth biggest killer. Age is no barrier to liver disease and, as such, raising awareness of risk factors across the age spectrum is essential. Viral Hepatitis is a large problem and is on the rising trend. There is a great need to reverse this growing problem and the promotion of a healthy liver as a way of life to this generation and the next is a key concept.

"Nurses" are integral in making an impact on this liver disease; nurses can make every contact count by identifying risk factors and by offering health promotion and education to help individuals to make informed choices.

This module on viral hepatitis for nurses will describe the knowledge, skills and attitudes that are required to deliver patient-centred liver care. The module focuses on patient centered outcomes and will be an indispensable tool for those commissioning, managing and developing the workforce. The module is intended to be used with other local policies and pathways around the scope of practice undertaken by nurses working at all levels.

Alongwith nurses, this module may also be useful for other health care professionals (HCPs) i.e. social workers, dieticians and drug and alcohol workers who are also working with patients with or at risk of liver disease in primary or secondary care and may be useful as part of their professional learning and development. The document can also be used by student nurses to improve their knowledge, understanding and skill acquisition of caring for people with or at risk of liver disease.

Message from Director

It gives me immense pleasure to know that Nurses from across the country would come to the Institute of Liver and Biliary Sciences (ILBS) to be trained in preventive and promotive aspects of care of patients with Viral Hepatitis. ILBS was started with the vision to not only be a Centre of Excellence for care of patients with Liver Diseases, but also, to be the destination of choice for bright doctors, research scholars and paramedical professions who intend to further their knowledge and skills in Hepatology.

Institute of Liver and Biliary Sciences is pleased to welcome each and every one of you to this 'Training Program on Viral Hepatitis'. We intend to share with you standard prtocols as well as new developments in screening, diagnosis and prevention of Viral Hepatitis. We hope that through this course we can help build a cadre of Nursing Professionals in India who are trained in Viral Hepatitis and may lead the way when the National Program for Control of Viral Hepatitis is Launched by the Government of India.

I would like to put on record my appreciation for the ILBS Team of Project PRAKASH for their untiring efforts. I would also like to congratulate the Nursing Faculty for putting up a wonderful course material which would serve as a ready reckoner for the learner.

I do hope that you will enjoy the learning process through Project PRAKASH; and in times to come become trainers to train others and spread the light of knowledge further down the public health system across the nation.

Dr. S. K. Sarin
Director, ILBS

ILBS - AS AN INSTITUTION

The Institute of Liver & Biliary Sciences (ILBS) has been established by the Government of the National Capital Territory of Delhi as an Autonomous Super Specialty Institute, under the Societies Registration Act – 1860, New Delhi. ILBS has been granted deemed to be University status by the University Grant Commission under Section 3 of UGC Act, 1956 under de-novo category through the Ministry of Human Resource Development, GOI.

The mission of ILBS is to become a dedicated international Center of Excellence for the diagnosis, management and advanced training and research in the field of liver and biliary diseases. ILBS offers training programs for super-specialties related to Hepato-Biliary and Pancreatic Sciences through the Post-Doctoral Courses: DM in Hepatology, Pediatric Hepatology, Organ Transplant Anesthesia and Critical Care; M.Ch. in Hepato-Pancreato-Biliary Surgery. PDCC courses in Virology, Microbiology, Biochemistry, Clinical Nutrition, Renal Replacement Therapy, Radiology, Intervention Radiology and Oncology for a duration of 1 year are also available. There is also a provision of short term courses and observership program for training the faculty and students of other institutes. The institute has also started M.Sc. in Nursing Program.

The mission of the Institute is to develop a facility with international standards, which could provide a comprehensive and a modern set up for the diagnosis and treatment, an advanced centre for dedicated research and resource for advanced training in the field of liver diseases, including liver transplantation, gall bladder and biliary diseases and allied specialties.

ILBS aims to serve as a torch-bearer model of health care in the country by amalgamating the skills and structure of academic Universities, clinical and research acumen of the super-specialists and the managerial skills of the corporate world.

INTRODUCTION

The Institute of Liver and Biliary Sciences (ILBS) is an autonomous deemed-to- be University under the Government of National Capital Territory (NCT) of Delhi. It is India's first and the only medical institute dedicated exclusively to the treatment, advanced training and research in Liver, Biliary and Allied Sciences.

Our mission is to serve as a torch-bearer model of health care in the country by amalgamating the skills and structure of academic Universities, clinical and research acumen of the super-specialists and the managerial skills of the corporate world.

ILBS is WHO Collaborating Centre (WHOCC) for Viral Hepatitis and Liver Disease in India. One of the key purposes of WHOCC is to serve as a resource centre for building the capacity of healthcare personnel in relation to viral hepatitis and liver diseases.

There are many challenges in prevention and eradication of viral hepatitis in India. Health professionals in the country need to join hands to deliver best services for viral hepatitis, so that we could achieve the target of viral hepatitis elimination by 2030 which is also the global call for action by WHO.

Project PRAKASH *aims to build capacity of primary care physicians and paramedical professionals for the management of viral hepatitis in the country.* This training will build capacities in the existing health care delivery system through comprehensive knowledge sharing among technical experts from ILBS and health professionals in India using a common platform.

Training consists of 2 programs:

❖ **Hepatitis Induction Program (HIP):**

- Sensitization - cum - A one-day training program on Viral Hepatitis at ILBS.
- Didactic Lectures by the Faculty, Live Demonstration and Workshops for the participants
- Some of the topics covered during the day are Epidemiology, Clinical Features, Diagnosis and Prevention of Viral Hepatitis; Needle Stick Injuries and Injection Safety, Management of Hepatitis A, B, C, D and E and Patient & Family Counselling etc.

❖ **Hepatitis Update Program (HUP):**

- Total duration of the program is 6 months
- The program would be run through web-based modules. The queries of the students would be clarified through mails by respective tutors.
- 'Certificate of Participation' at the end of the program would be on the basis of performance in formative and summative assessments.

TEAM: Core Strength

Core Team

Dr. S.K.Sarin,
Director, ILBS

Dr. Girish Chandra,
Head Operations

Dr. Anil Agarwal,
Dy. Head, Admin

Dr. Neeraj Raizada
Assistant Professor,
Epidemiology

Ms. Akanksha Bansal,
Manager (Projects)

Mr. Vineet Singh,
IT Engineer, (Projects)

Mr. Vinay Kumar
Assistant Admin (Projects)

Speakers

Ms. Minnie George,
Principal & Faculty, ILBS, College of Nursing

Dr. Archana Ramalingam,
Assistant Professor, Epidemiology

Dr. Reshu Agarwal
Assistant Professor,
Department of clinical Virology

Ms. Cicily Babu,
ILBS,Nurse Manager

Ms. Madhavi Verma,
Faculty, ILBS,College of Nursing

Ms. Sarita Ahwal
Lecturer, ILBS College of Nursing

Ms. Tarika Sharma
Lecturer, ILBS College of Nursing

Ms. Seena Babu
ILBS,Nurse Educator

Ms. Anila Goswami,
Hepatitis Specialist Nurse

Course Curriculum

Hepatitis Induction Program

COURSE CURRICULUM 2018-19		
Session	**Activity**	**Details**
SESSION 1	"INTRODUCTION (Assessments & Lecture)"	1. Participant Introduction 2. Pre-Training Assessment 3. Overview and Epidemiology of Viral Hepatitis
SESSION 2	DIAGNOSIS AND MANAGEMENT (Lectures)	1. Clinical Features and Diagnosis of Viral Hepatitis 2. Management of Viral Hepatitis and its Complications
SESSION 3	PREVENTION (Lecture)	1. Prevention of Viral Hepatitis
SESSION 4	INFECTION CONTROL (Lecture) PANEL DISCUSSION	2. Needle Stick Injury and Injection Safety Q & A Round
SESSION 5	DIAGNOSIS	1. Lab Diagnosis of Viral Hepatitis 2. Fibroscan
SESSION 6	ROLE OF NURSES AND HEALTH ASSOCIATE (Lectures)	5. Q & A Round 1. Role of Nurses and Health Associates as Brand Ambassadors of Health Care 2. Pre and Post Test Counselling of Patients and Family
SESSION 7	CLOSING	1. Post-Training Assessment 2. Feedback About Training 3. Valedictory and Certificate Distribution

HEPATITIS UPDATE PROGRAM

S.No	TOPICS OF DISCUSSION
1	INTRODUCTION TO HUP PROGRAM/ HAND HOLDING & MONITORING
2	APPROACH TO ABNORMAL LFT
3	INFECTION CONTROL PRACTICES (Self & Others)
4	PERSONAL PROTECTIVE EQUIPMENTS (PPE)
5	BLOOD BORNE INFECTIONS & PEP
6	FAMILY SCREENING AND COUNSELLING
7	NURSING & LEGAL ASPECTS OF LIVER TRANSPLANT
8	COAGULATION DISORDERS
9	ASSESSMENT SCALES FOR CRITICALLY ILL HEPATITIS PATIENTS
10	MANAGEMENT OF ASCITIES
11	MANAGEMENT OF HEPATIC ENCEPHALOPATHY
12	MANAGEMENT OF PATIENTS DURING SURGICAL PROCEDURES - ENDOSCOPY, BIOPSY

CONTEXT FOR DEVELOPING THIS MODULE

Viral hepatitis has emerged as a major public health problem throughout the world affecting several hundreds of millions of people. Viral hepatitis is a cause of considerable morbidity and mortality in the human population, both from acute infection and chronic sequelae. The estimated 400-500 million people with chronic viral hepatitis has been recently described as a game changer in Hepatology. It is aimed to transform the way nurses and health associates support people with viral hepatitis to deliver optimum outcomes with the trained health care workforce those with viral hepatitis would be identified earlier, diagnosed with improved accuracy and receive treatment that is equitable, responsive, high-quality and effective with the overall aim of reducing premature mortality associated with viral hepatitis.

Viral hepatitis care in India should be from the right person, at the right time, in the right place, within evidence-based standards of care and treatment in order to ensure dignity and respect which are at the heart of the patient journey.

This module may also serve as a baseline for development of a concept "Viral Hepatitis Nurse".

LEARNING OUTCOMES

After completion of the training the nurses will be able to:

- Prevent the disease occurrence and protects the high-risk groups by providing individual, family and community counselling in terms of awareness programmes.
- Support patients (and family/carriers) in their understanding of their condition through patient education and health promotion.
- Undertake a comprehensive clinical assessment including risk profiling and follows up with appropriate action, including identification and proper referral to specialists, for relevant acute and chronic health care conditions.
- Develop and evaluate a counselling plan for patient who are at high risk for viral hepatitis
- Provide specific diagnostic/treatment options safely by:
  - Following strict infection control measures
  - Adhering to the safe injection practices
- Follow the diversified roles of nurses in supporting the slogan “Healthy Liver”

UNDERSTANDING THE BASICS OF LIVER

Understanding the Anatomy and Physiology of Liver:

The liver is the largest solid organ in the body. In adults, the liver can weigh up to 1.5 kilograms. It is in the upper-right abdomen, just under the rib cage and below the diaphragm. The liver is part of the digestive system.

Liver has 2 main lobes: the larger right lobe and the smaller left lobe. Each lobe is divided into segments. The lobes are separated by a band of tissue called the falciform ligament (also called the broad ligament), which helps attach the liver to the diaphragm. A layer of connective tissue, called Glisson's capsule or the Capsule, covers the liver.

Unlike most other organs, the liver has 2 major sources of blood:

- Portal vein – carries blood from the digestive system to the liver
  - Approximately 75% of the liver's blood supply comes from the portal vein.
- Hepatic artery – supplies the liver with oxygen-rich blood from the heart

- Most of the blood is removed from the liver through 3 hepatic veins (the right, middle and left hepatic veins) found inside the liver.

FUNCTIONS:
The liver performs many important functions in the body. The liver:

- Produces bile
- Absorbs and uses (metabolizes) bilirubin
- Helps the body make blood-clotting (coagulation) factors
  - The body needs bile, which is produced by the liver, to absorb vitamin K. The body uses vitamin K to produce blood-clotting factors.
  - If the liver does not produce enough bile, the body will absorb less vitamin K and produce less blood-clotting factors.

- Helps the body metabolize fat
- Metabolizes protein
- Metabolizes carbohydrates
  - The body breaks down carbohydrates from food into glycogen, which is stored in the liver. The liver breaks down glycogen into glucose and releases it into the blood to maintain normal blood sugar levels.

- Stores vitamins and minerals
  - Vitamins A, D, E, K and B12 are stored in the liver.
  - The liver stores iron in the form of ferritin, which it releases so the body can make new RBCs.
  - The liver stores and releases copper as needed.
- Filters the blood
  - The liver filters certain substances from the blood so that they don't build up and cause damage. These substances can come from within or outside the body.
    - Substances that come from within the body (endogenous) include hormones, such as estrogen, aldosterone and diuretic hormone.
    - Substances that come from outside the body (exogenous) include alcohol and other drugs, such as amphetamines, barbiturates and steroids.

REGENERATION:

The liver has the unique ability to regrow parts that have been removed so that it can continue to function in the body.

- Up to 80% of liver function can be maintained even after a large part of the liver has been removed.
- The regeneration process continues over several months until the missing liver tissue is replaced.
- The length of time for this process depends on the person's age, nutrition, if there is any liver damage and how much liver was removed.

VIRAL HEPATITIS

Viral hepatitis is a viral infection of the liver associated with a broad spectrum of clinical manifestations from asymptomatic infection through icteric hepatitis to hepatic necrosis. The majority of all viral hepatitis cases are preventable. Viral hepatitis includes five distinct disease entities, which are caused by at least five different viruses.

Five forms of Viral Hepatitis:

1. ***HEPATITIS A (HAV)***

- Is caused by an RNA virus of the enterovirus family.
- It spreads primarily by fecal-oral route, usually through the ingestion of infected food or liquids.
- It may also spread from person-to-person contact and, rarely, by blood transfusion.
- Type A hepatitis occurs worldwide, especially in areas with overcrowding and poor sanitation.

2. ***HEPATITIS (HBV)***

- Is caused by a double-shelled virus containing DNA.
- It spreads primarily through blood (percutaneous and permucosal route).
- It can also spread by way of saliva, breast feeding, or sexual activity (blood, semen, saliva, or vaginal secretions.
- Male homosexuals are at high risk for infection.
- After acute infection, 10% of patients progress on to carrier status or develop chronic hepatitis.
- Chronic HBV infections is an important cause of cirrhosis and hepatocellular carcinoma.

3. ***HEPATITIS (HCV)***

- Formerly called non-A, non-B hepatitis, usually spreads through blood or blood product transfusion, usually from asymptomatic blood donors.
- It may also be transmitted through unsterile piercing or tattooing tools or dyes.
- It commonly affects I.V. drug users and renal dialysis patients and personnel.
- HCV is infection an important cause form of posttransfusion hepatitis.
- HCV infections have a chronicity rate of around 80%

4. ***Hepatitis (HDV)***

- Also known as Delta hepatitis.
- Is caused by a defective RNA virus that requires the presence of hepatitis B-specifically, hepatitis B surface antigen (HBsAg) – to replicate.
- HDV occurs along with HBV or may superinfect a chronic HBV carrier, and cannot outlast a hepatitis B infection.

- It occurs primarily in I.V. drug users or those who have had multiple blood transfusions, but the highest incidence is in the Mediterranean, Middle East, and South America.

5. ***HEPATITIS (HEV)***

- Is caused by a non enveloped, single-stranded RNA virus.
- It transmitted by the fecal-oral route but is hard to detect because it is inconsistently shed in the feces.
- Its occurrence is primarily in India, Africa, Asia, or Central America.
- It is the most common course of fulminant hepatitis in pregnant woman.

HEPATITIS A – HAV

DEFINITION:

Hepatitis A is an acute inflammation of the liver caused by hepatitis A virus that is not really very severe. It is known as infectious hepatitis because it spreads relatively easy from those infected to close contact.

EPIDEMIOLOGY:

Globally, an estimated 1.4 million cases of hepatitis A virus (HAV) infection occur annually. The proportion of young adults at risk of HAV infection is very low in India. The Indian population is showing a recent upward shift in the average age at first HAV infection, among the socio-economically developed population resulting in pockets of susceptible populations.

INCUBATION PERIOD:

The incubation period for hepatitis A ranges from 15-60 days or three to five weeks; with a mean incubation period of 30 days.

PERIOD OF COMMUNICABILITY: The infected patient is capable of transmitting the organism a week before and a week after the appearance of symptoms.

MODE OF TRANSMISSION:

Hepatitis A virus is transmitted by

- Fecal – oral mode.
- Ingestion of contaminated drinking water or ice, uncooked fruits and vegetables grown in or washed with contaminated water.
- Infected food handlers.
- Waterborne outbreaks, though infrequent, are usually associated with sewage-contaminated or inadequately treated water and
- Also, by close physical contact with an infectious person, although casual contact among people does not spread the virus

HIGH RISK GROUPS:

- Children in Day Care Centres can transmit infection through diapers and toys.
- Troops living under crowded conditions at military camps or in the field
- Homosexual men (via oral-anal sexual contact).
- People in areas with breakdown sanitary conditions (after flood and other natural disaster)

RISK FACTORS:

- Poor sanitation
- Lack of safe water
- Injecting drugs
- Living in a household with an infected person;
- Sexual contact with acute hepatitis A infected partner.
- Travelling to high endemic areas without being immunized.

CLINICAL MANIFESTATIONS:

- Flu-like illness with chills and high fever
- Fatigue
- Abdominal pain, diarrhea
- Nausea and loss of appetite
- Jaundice and dark-colored urine.
- The infection in young children is often mild and asymptomatic.

DIAGNOSIS:

- Specific diagnosis: HAV specific immunoglobulin G (IgG) and immunoglobulin N (IgM) antibodies in the blood.
- Liver function test – to determine the presence and extent of liver damage and to check the progress of the liver disease
- Bile examination in stool and urine
- RT-PCR: Reverse Transcriptase Polymerase Chain Reaction to detect Hepatitis A virus RNA.

TREATMENT MODALITIES:

- There is no specific treatment although bed rest is essential.
- Treatment therapy is aimed at maintaining comfort and adequate nutritional balance
- Diet must be high in carbohydrate, low in fat and protein.
- Replacement of fluids (lost in vomiting and diarrhea) is necessary.

COMPLICATIONS:

- Progressive encephalopathy characterized by drowsiness and cerebral edema
- GIT bleeding progressing to stupor and later coma. Bleeding may not be responsive to parenteral Vitamin K administration.
- Clonus and hyperreflexia are later replaced by loss of deep tendon reflexes.
- Edema and ascites
- Aplastic anemia.
- In late course of the disease, loss of corneal and papillary reflexes, elevated arterial blood, respiratory failure, to cerebrovascular collapse may be present.
- This may also result in fulminant Hepatic Failure

NURSING MANAGEMENT:

- The patient must be isolated (enteric isolation).
- Patient should be encouraged to rest during acute or symptomatic phase.
- Improve nutritional status.
- Utilize appropriate measures to minimize spread of the disease.
- Observe the patient for melena and check stool for the presence of blood.
- Provide optimum skin and oral care.
- Increase in ability to carry out activities.
- Encourage the patient to limit activity when fatigued.
- Assist the client in planning periods of rest and activity.
- Encourage gradual resumption of activities and mild exercise during recovery.

PREVENTING THE SPREAD OF INFECTION: Patent must be advised to

- Stay off work / school for at Least a week since the Symptoms Stansted
- Wash hands with soap & water regularly
- Avoid Sharing towels and wash soiled Laundering Separately
- Avoid preparing food for others
- Avoid having sex while the patient is infections
- Clean the toilet flush handles & taps more frequently than usual

HEPATITIS E – HEV

Hepatitis E is a liver disease caused by the hepatitis E virus (HEV): a small virus, single-stranded ribonucleic acid (RNA) genome. The virus has at least 4 different types: genotypes 1, 2, 3 and 4. Genotypes 1 and 2 have been found only in humans. Genotype 3 and 4 viruses circulate in several animals (including pigs, wild boars, and deer) without causing any disease, and occasionally infect humans.

EPIDEMIOLOGY:

- Hepatitis E prevalence is highest in the South East Asia regions, accounting for 60% of hepatitis E global incidence and 65% of global deaths. Despite the high endemicity of hepatitis E virus (HEV) in the South East Asian region, the sero-prevalence of antibody to HEV is only 25% in young adults. Among the Indian population, there is low sero-prevalence until age 15, reaching 40% in young adults.

- Hepatitis E affects young adults, similar to hepatitis A, and has a self-limiting course. Mortality rates in the general endemic population, range between 0.5–4% and are much higher in women during pregnancy (15–20%). Hepatitis E can also cause fetal complications, especially in the third trimester.

- There are four strains of hepatitis E called “genotypes.” Genotypes 1 and 2 are found in Asia and Africa; genotype 3 is found worldwide, including Europe and the UK; and genotype 4 is found in China and Japan.

INCUBATION PERIOD:

The incubation period ranges from 15-60 days.

MODE OF TRANSMISSION:

The hepatitis E virus is spread in a way similar to hepatitis A, known as ‘faecal-oral’ transmission.

CLINICAL MANIFESTATIONS:

The course of infection has 2 phases, the prodromal phase and the icteric phase.

The prodromal phase usually is of short duration. Prodromal-phase symptoms include the following:

- Myalgia
- Arthralgia
- Fever with mild temperature elevations (25-97%)
- Anorexia (66-100%)
- Nausea/vomiting (30-100%)

- Weight loss (typically 2-4 kg)
- Dehydration
- Right upper quadrant pain that increases with physical activity (abdominal pain is reported in 35-80% of patients)

Icteric-phase symptoms may last days to several weeks and include the following:

- Jaundice - May be difficult to see with some patients' natural skin color; serum bilirubin level is usually higher than 3 mg/dL; scleral icterus is present; usually occurs between the fifth and eighth week after infection
- Dark urine
- Light-coloured stools (20-40%)
- Pruritus (50%)

Other features include the following:

- Malaise (most common), Arthritis, Pancreatitis, Aplastic anemia, Thrombocytopenia.
- Neurologic symptoms: Polyradiculopathy, Guillain–Barré syndrome, Bell palsy, peripheral neuropathy, ataxia, and mental confusion
- Nephrotic symptoms: Membranoproliferative glomerulonephritis and membranous glomerulonephritis.

Autochthonous Hepatitis E also has a striking spectrum of serious complications, including "acute-on-chronic" liver failure, neurologic disorders, and chronic hepatitis.

Acute-on-chronic disease refers to hepatitis with a rapid appearance of signs of liver failure, ascites and encephalopathy in a person with pre-existing liver disease.

DIAGNOSIS:

Basic Laboratory Studies:

- Elevation in the serum aminotransferase levels is the laboratory hallmark of acute viral hepatitis.
- Serum alanine aminotransferase (ALT) level is usually higher than the serum aspartate aminotransferase (AST) level.
- The serum alkaline phosphatase level may be normal or slightly increased (< 3 times upper limit of normal).
- Serum bilirubin level usually ranges from 5-20 mg/dL, depending on the extent of hepatocyte damage.
- The patient may develop leukopenia with neutropenia or lymphopenia.
- Prolonged prothrombin time, decreased serum albumin, and very high bilirubin are signs of impending hepatic failure requiring referral to a liver transplantation center.

Serologic Testing:

Detection of anti-HEV immunoglobulin M (IgM).

The anti-HEV IgM usually starts rising 4 weeks after infection and remains detectable for 2 months after the onset of illness by enzyme immunoassay or rapid immunochromatography.

TREATMENT:

- There is no specific treatment for hepatitis E infection. It is regarded as a self-limiting disease. Most people who have hepatitis E will go on to recover completely within four weeks from the start of their symptoms.
- Anti-viral therapy using drug may be indicated in some patients.
- If the patient is pregnant or have a pre-existing liver condition, refer to a specialist urgently.

HEPATITIS B - HBV

INTRODUCTION:

HBV is a vaccine –preventable disease that is highly infectious caused by Hepatitis B virus and without intervention, 15-40% of chronically infected people will go on to develop cirrhosis, end-stage liver disease, or Hepatocellular Carcinoma. It occurs in both rapidly developing (acute) and long-lasting (chronic) forms, and is one of the most common chronic infectious diseases worldwide

DEFINITION:

Hepatitis B is a potentially serious form of liver inflammation due to infection by the hepatitis B virus (HBV).

EPIDEMIOLOGY:

Hepatitis B is a serious global health problem, responsible for 1.4 million deaths every year. India has over 40 million hepatitis B (HBV) infected patients (second only to China) and constitutes about 15 per cent of the entire pool of hepatitis B in the world.

Tribal areas have high prevalence of hepatitis B. Every year, nearly 600,000 patients die from HBV infection in the Indian sub continent. With a population of more than 1.25 billion, India has more than 37 million HBV carriers and contributes a large proportion to the worldwide pool of HBV carriers

CAUSES:

Hepatitis B is a liver disease caused by infection with the hepatitis B virus

Viral Life Cycle:

The 5 stages that have been identified in the viral life cycle of hepatitis B infection are briefly discussed below. Different factors have been postulated to influence the development of these stages, including age, sex, immunosuppression, and co-infection with other viruses.

Stage 1: Immune tolerance:

This stage, which lasts approximately 2-4 weeks in healthy adults, represents the incubation period. For newborns, the duration of this period is often decades. Active viral replication is known to continue despite little or no elevation in the aminotransferase levels and no symptoms of illness.

Stage 2: Immune active/immune clearance:

In the immune active stage, also known as the immune clearance stage, an inflammatory reaction with a cytopathic effect occurs. HBeAg can be identified in the sera. The duration of this stage for patients with acute infection is approximately 3-4 weeks (symptomatic

period). For patients with chronic infection, 10 years or more may elapse before cirrhosis develops, immune clearance takes place, HCC develops, or the chronic HBeAg-negative variant emerges.

Stage 3: Inactive chronic infection:

In the third stage, the inactive chronic infection stage, the host can target the infected hepatocytes and HBV. Viral replication is low or no longer measurable in the serum, and anti-HBe can be detected. Aminotransferase levels are within the reference range. It is most likely at this stage that an integration of the viral genome into the host's hepatocyte genome takes place. HBsAg still is present in the serum.

Stage 4: Chronic disease:

The emergence of chronic HBeAg-negative disease can occur from the inactive chronic infection stage or directly from the immune active/clearance stage.

Stage5: Recovery:

In the fifth stage, the virus cannot be detected in the blood by DNA or HBsAg assays, and antibodies to various viral antigens have been produced. The image below depicts the serologic course of HBV infection

HIGH RISK GROUPS:

- People having sex with an infected person
- People having a pre-existing sexually transmitted disease
- Men who have sexual contact with other men
- Infants born to infected mothers
- Hemodialysis patients
- People who travel to Countries with moderate to high rates of hepatitis B
- Birth in a region with intermediate or high endemicity Infant of HBsAg-positive mother
- Exposure before 7 years of age (e.g., child's immediate and/or extended family immigrated from a region of intermediate/high endemicity and/or child visited such a region)
- Family history of hepatitis B or Hepatoma
- Exposure to HBsAg-positive person (e.g., percutaneous, sexual/household contact)
- High-risk sexual activities (e.g., unprotected sex, multiple sexual partners)
- Substance use with sharing of equipment (e.g., injection/inhalation drug use)
- Exposure to blood/blood products in endemic regions without routine precautions/screening
- Use of shared/contaminated materials or equipment (e.g., instruments/tools used for personal services procedures such as tattooing / piercing / body modifications, or any alternative health care that has the potential to break the skin) Use of shared/contaminated medical devices (e.g., glucometers)
- Occupational exposure to blood / body fluids

MODE OF TRANSMISSION:
The virus is spread when blood, semen, or vaginal fluids (including menstrual blood) from an infected person enter another person's body. This usually happens through:

- **Sexual contact:** The hepatitis B virus can enter the body through a break in the lining of the rectum, vagina, urethra (the tube that carries urine out of the body), or mouth.
- Sharing needles and other equipment (such as cotton, spoons, and water) used for injecting illegal drugs.
- **Work tasks:** People who handle blood or instruments used to draw blood may become infected. Health care workers are at risk of infection if they are accidentally stuck with a used needle or other sharp instrument that has an infected person's blood on it. Infection also can occur if blood splashes onto an exposed surface, such as the eyes, the mouth, or a cut in the skin.
- **Childbirth:** A newborn baby can get the virus from his or her mother. This can happen during delivery when the baby comes in contact with the mother's body fluids in the birth canal. But breastfeeding doesn't spread the virus from a woman to her child.
- **Body piercings and tattoos:** The virus may spread when needles used for body piercing or tattooing isn't sterilized and infected blood enters a person's skin.
- **Toiletries:** Grooming items such as razors and toothbrushes can spread the virus if they carry blood from a person who is infected.

INCUBATION PERIOD:
The incubation period ranges from 45-180 days (average is 60-90 days)

SIGNS AND SYMPTOMS:
Symptoms of hepatitis B may not appear for up to 6 months. Early symptoms include:

- Appetite loss
- Fatigue
- Low fever
- Muscle and joint aches
- Nausea and vomiting
- Yellow skin and dark urine

Symptoms will go away in a few weeks to months if your body is able to fight off the infection. Some people never get rid of the hepatitis B virus. This is called chronic hepatitis B. People with chronic hepatitis may not have symptoms and not know they are infected. Over time, they may develop symptoms of liver damage and cirrhosis of the liver.

Acute HBV with Severe Presentation: Manifestations include fatigue, jaundice, altered mental status (encephalopathy), and abdominal swelling (ascites).
In patients with chronic HBV infection, spontaneous flares of disease or flares precipitated by withdrawal from immunosuppressive therapy can result in fulminant hepatitis. It is important to watch for signs of impending liver failure.

DIAGNOSTIC TESTS:

Significance of HBV Serological Markers:

- **HBsAg (surface antigen)** indicates infection. Persistence of HBsAg for 6 months or more indicates chronic infection. However, up to 50% of people with extended chronic infection will eventually clear HBsAg.
- **Anti-HBs (surface antibody)** is a protective antibody produced with recovery from infection or in response to immunization.
- **Anti-HBc IgM (core antibody - IgM)** appears early in acute HBV infection and persists for about 6 months. It may also be seen in chronic infection during flares of activity, so clinical/epidemiological correlation is required for interpretation.
- **Anti-HBc total (total core antibody - IgM and IgG)** is a marker of past exposure or current infection. IgG usually persists for life.
- **HBeAg (e-antigen)** is a marker of viral replication; its presence indicates high infectivity. .
- **Anti-HBe (e-antibody)** appears with recovery from acute infection. In chronic infection, the presence of anti-HBe is generally a marker of reduced viral replication, indicating a less infectious state.

MANAGEMENT:

The primary treatment goals for patients with hepatitis B infection are to prevent progression of the disease, particularly to cirrhosis, liver failure, or hepatocellular carcinoma (HCC).

Non-pharmacological Therapy:

- Dietary changes: For individuals with decompensated cirrhosis (prominent signs of portal hypertension or encephalopathy), the following dietary limitations are indicated:
  - A low-sodium diet (1.5 g/day)
  - High-protein diet (ie, white-meat protein [eg, chicken, turkey, fish])
  - Fluid restriction (1.5 L/day) in cases of hyponatremia
- Monitoring blood work regularly, regardless of phase

Pharmacotherapy:

The goals of pharmacotherapy in patients with hepatitis B disease are to reduce the risk of progression of disease, prevent transmission to others, and decrease complications.

The following medications are used in the treatment of hepatitis B:

- Nucleoside reverse transcriptase inhibitors (e.g. tenofovir disoproxil fumarate, lamivudine)
- Hepatitis B agents (e.g., adefovir dipivoxil, entecavir, telbivudine, PEG-IFN-a 2a, interferon alfa-2b)

Currently, pegylated interferon alfa (PEG-IFN-a), entecavir (ETV), and tenofovir disoproxil fumarate (TDF) are the first-line agents in the treatment of hepatitis B disease.

MANAGEMENT OF CHRONIC HEPATITIS B:

The goal of managing chronic HBV is to prevent progression to cirrhosis, HCC, and liver decompensation by:

- Monitoring blood work regularly, regardless of phase
- Determining who requires or would benefit from antiviral therapy
- Monitoring for portal hypertension and evidence of progression to cirrhosis or HCC
- Determining who would benefit from a liver biopsy to assess disease severity (ultrasound will detect most - but not all - cases of cirrhosis)

If you develop advanced liver damage and your condition becomes life-threatening, you may need a liver transplant. But not everyone is a good candidate for a liver transplant.

COMPLICATIONS:

People with hepatitis B can sometimes develop serious liver problems. These mostly affect people with an untreated long-term (chronic) infection.

Some of the main problems associated with chronic hepatitis B include:

a. Cirrhosis

Scarring of the liver (cirrhosis) affects around one in five people with chronic hepatitis B, often many years after they first got the infection. Cirrhosis doesn't usually cause any noticeable symptoms until extensive damage to the liver has occurred, when it can cause:

- tiredness and weakness/ Lethargy, Malaise
- loss of appetite/ Anorexia
- weight loss/ Emaciation
- feeling sick
- very itchy skin/ Intense pruritus
- tenderness, pain, or swelling in the tummy/ Ascites
- swelling of the ankles/ Oedema

There's currently no cure for cirrhosis, although it's possible to manage the symptoms and slow its progression. If the liver becomes severely damaged, a liver transplant may be needed.
Read more about the treatments for cirrhosis.

b. Liver Cancer

People with cirrhosis caused by hepatitis B have around a 1 in 20 chance of developing liver cancer every year. Symptoms of liver cancer include:

- unexplained weight loss
- loss of appetite
- feeling very full after eating, even if the meal was small
- feeling and being sick
- yellow skin and eyes (jaundice)

c. Fulminant Hepatitis B

In less than 1 in 100 cases, short-term (acute) hepatitis B can lead to a serious problem called fulminant hepatitis B. This is where the immune system attacks the liver and causes extensive damage to it. It can lead to symptoms such as:

- confusion
- collapsing
- swelling of the tummy caused by a build-up of fluid
- severe jaundice

Fulminant hepatitis B can cause the liver to stop working properly and is often fatal if not treated quickly.

PATIENT EDUCATION AND COUNSELLING:

Specific Guidance for All Patients to Reduce the Risk of Transmission:

- Inform healthcare providers (e.g., dentist, physician, nurse) and other providers of personal services whose care involves piercing of the skin (e.g., acupuncturist, tattoo artist) of your infection.
- Do not donate blood, organs, semen, or tissues.
- Do not share personal hygiene materials / sharp instruments (e.g., razors, nail clippers, toothbrushes, glucometers).
- Safely dispose of articles contaminated with blood (e.g., feminine hygiene products, dental floss, bandages, needles, broken glass).
- Cover all cuts and sores.
- Clean up blood spills with diluted household bleach (9 parts water to 1 part bleach). Leave the solution on the surface for 10 minutes before wiping it away. If others must clean up blood spills, they should wear protective gloves and wash their hands thoroughly after removing them.
- Ensure sexual partner(s), household members, and drug use partner(s) are tested and immunized if susceptible. Hepatitis B vaccine is free for susceptible contacts
- Use condoms with all sexual partners until testing shows they are immune.
- Do not share any equipment used to prepare, inject, or inhale drugs (e.g.,

syringes/needles, spoons, drug solutions, water, wash filters, cookers, pipes, straws, devices for snorting drugs).

Pregnant Women and Infants

- If you are pregnant or considering pregnancy, consult your HCP for advice on reducing the risk of mother-to-child transmission. Pregnant women need to be assessed before their third trimester to see if treatment is indicated.
- Infants born to HBV-positive women require PEP including HBIg and HBV vaccine to reduce the risk of mother-to-child transmission

For Patients with Acute HBV

- Acute hepatitis B does not require anti-viral treatment.
- A follow-up blood test is required 6 months later to determine if the infection has resolved.
- For Patients with Chronic HBV
- Reducing the risk of liver damage(Fibrosis progression)
- Have liver enzymes monitored every 6-12 months.
- Reduce or eliminate alcohol.
- Stop smoking, as it increases the risk of liver cancer.
- You may drink coffee; 3 or more cups per day may reduce the risk of liver cancer.
- Maintain a healthy weight.
- Get vaccinated against hepatitis A if you are not already immune
- Stick to your medication schedule and your regular lab testing and follow-up visits.
- Tell the HCP before starting any immunosuppressive therapy.
- Tell the doctor about any complementary/alternative therapies or over the counter supplements including herbal remedies that you are taking.
- Follow the advice on how frequently you require abdominal ultrasounds.
- Living well with HBV
- Enjoy physical activities. There are no restrictions on working out or sports, including contact sports.
- Eat a healthy diet.
- Allow children to go to school or day care and to play with other children.
- Kissing or sharing food/utensils pose no risk for transmission.

HBV Vaccination

- HBV vaccine is given routinely to all children at birth as zero dose and then as a part of pentavalent vaccine at 6, 10 and 14 weeks of life
- Hepatitis B vaccine is advised for healthcare workers. The vaccine is given intramuscularly as dose schedule at 0,1 and 6 months.
- Health care workers should also check their antibody tire periodically of the titer drops below 10IU/L the health care worker has to be given a booster dose of the vaccine.

HEPATITIS C - HCV

KEY FACTS & FIGURES:

Hepatitis C is a liver disease caused by the hepatitis C virus: the virus can cause both acute and chronic hepatitis infection, ranging in severity from a mild illness lasting a few weeks to a serious, lifelong illness.

The hepatitis C virus is a blood borne virus and the most common modes of infection are through unsafe injection practices; inadequate sterilization of medical equipment; and the transfusion of unscreened blood and blood products.

There is currently no vaccine for hepatitis C; however, research in this area is on-going.

EPIDEMIOLOGY:

- 130–150 million people globally have chronic hepatitis C infection.
- A significant number of those who are chronically infected will develop liver cirrhosis or liver cancer.
- Approximately 500 000 people die each year from hepatitis C-related liver diseases.
- Antiviral medicines can cure approximately 90% of persons with hepatitis C infection, thereby reducing the risk of death from liver cancer and cirrhosis, but access to diagnosis and treatment is low.
- About 15–45% of infected persons spontaneously clear the virus within 6 months of acute infection without any treatment. The remaining 55–85% of persons will develop chronic HCV infection. Of those with chronic HCV infection, the risk of cirrhosis of the liver is 15–30% within 20 years.

TYPES:

1. Acute Hepatitis C virus infection is a short-term illness that occurs within the first 6 months after someone is exposed to the hepatitis C virus. For most people, acute infection leads to chronic infection.
2. Chronic Hepatitis C virus infection is a long-term illness that occurs when the hepatitis C virus remains in a person's body. Without treatment, hepatitis C can last a lifetime and lead to serious liver problems, including cirrhosis (scarring of the liver) liver failure, and even liver cancer.

MODE OF TRANSMISSION:

The hepatitis C virus is transmitted, or spread,

- When blood from a person infected with the hepatitis C virus enters the body of someone who is not infected.
- Sharing needles or other equipments to inject drugs.
- Blood transfusions and organ transplants.

- Sexual roule - men who have sex with men (MSM), who are HIV-positive, and have multiple sex partners have an increased risk for hepatitis C.
- Tattoos or body piercings given in informal settings (such as prisons) or with non-sterile instruments.
- Hepatitis C is not transmitted by kissing; hugging; shaking hands; sharing food, glasses, or utensils; coughing; sneezing; mosquitos; or animals.

HIGH RISK GROUPS:

Persons who should be tested for hepatitis C virus (HCV) infection include those who:

- Currently inject drugs
- Ever injected drugs, including those who injected once or a few times many years ago
- Have certain medical conditions, including persons:
  - who received clotting factor concentrates produced before 1987
  - who were ever on long-term hemodialysis
  - with persistently abnormal alanine aminotransferase levels (ALT)
  - who have HIV infection
- Were prior recipients of transfusions or organ transplants, including persons who:
  - were notified that they received blood from a donor who later tested positive for HCV infection
  - received a transfusion of blood, blood components, or an organ transplant before July 1992
- Persons with a recognized exposure including:
  - Healthcare, emergency medical, and public safety workers after needle sticks, sharps, or mucosal exposures to HCV-infected blood
  - Children born to women with hepatitis C

CLINICAL MANFESTATIONS:

- Many people with hepatitis C do not have symptoms.
- If symptoms occur with acute infection, they can appear anytime from 2 weeks to 6 months after exposure.
- Symptoms of chronic hepatitis C can take decades to develop.
- Since infection with the hepatitis C virus can harm the liver, symptoms for both acute and chronic hepatitis C are similar.
- Symptoms can include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, grey-coloured stools, joint pain, and jaundice.
- Hepatitis C can silently cause liver damage without causing any symptoms.
- Unfortunately, with chronic infection, when symptoms do appear, they often are a sign of advanced liver disease

DIAGNOSIS OF ACUTE AND CHRONIC HEPATITIS C:

A hepatitis C antibody test sometimes called the Anti-HCV Test, are detectable by enzyme immunoassay (EIA), this looks for antibodies to the hepatitis C virus.

If the antibody test is positive/reactive, an additional blood test called a Ribonucleic acid (RNA) test / polymerase chain reaction (PCR) test is needed to determine if a person is currently infected with hepatitis C.

MANAGEMENT:

Aim of treatment: The aims of antiviral therapy in chronic hepatitis C are to:

- Eradicate the infection;
- Prevent disease progression;
- Improve liver histology;
- Improve survival;
- Improve symptoms.

TREATMENT

- With the advent of the recently developed oralDirect Acting Antivirals (DAAs), treatment of HCV has become a relatively straightforward approach, with high sustained virological response rates (SVR). However, in a resource poor country like India, the cost of these medicines as well as the high cost of repeated RNA testing, remains a formidable barrier to treating impoverished patients.

- It is advisable to vaccinate against HBV and HAV prior to starting treatment. Starting DAAs in patients with concurrent HBV infection carries the risk of reactivation of HBV and progression of liver disease.

- A detailed discussion on treatment strategies and follow up testing is beyond the scope of this text. Readers are advised to refer to the latest guidelines on HCV management

- (AASL & IDSA guidelines: https://www.hcvguidelines.org/)
  (WHO guidelines : http://www.who.int/hepatitis/publications/hepatitis-c-guidelines-2016/en/)

PREGNANCY AND HCV INFECTION:

- Pregnant women should be tested for anti-HCV only if they have risk factors for HCV infection.
- Approximately 6 of every 100 infants born to HCV-infected mothers become infected with the virus.
- Transmission occurs at the time of birth, and no prophylaxis is available to prevent it.
- Most infants infected with HCV at birth have no symptoms and do well during childhood.

- Although there is no evidence that breastfeeding spreads HCV, HCV-positive mothers should consider abstaining from breastfeeding if their nipples are cracked or bleeding.
- Children born to HCV-infected mothers should be tested for anti-HCV no sooner than age 18 months because anti-HCV from the mother might last until this age.

COUNSELLING PATIENTS:

- Patients should be informed about the low but present risk for transmission with sex partners.
- Avoid sharing personal items that might have blood on them, such as toothbrushes or razors.
- Cuts and sores on the skin should be covered to keep from spreading infectious blood or secretions.
- Donating blood, organs, tissue, or semen can spread HCV to others.
- HCV is not spread by sneezing, hugging, holding hands, coughing, sharing eating utensils or drinking glasses, or through food or water.
- Patients may benefit from joining a support group.
- HCV-positive persons should be advised to avoid alcohol because it can accelerate cirrhosis and end-stage liver disease.
- Patients should check with the doctor before taking any new prescription pills, over-the counter drugs (eg. non-aspirin pain relievers), or supplements, as these can potentially damage the liver.

PREVENTION:

- Do not share any injection equipment including needles, water, cottons, cookers, or preparation surfaces to inject drugs, cosmetic substances, or steroids. Washing hands before preparing an injection is also very important.
- Do not use any personal items that may have come into contact with the blood of a person infected with hepatitis C. This includes medical equipment, such as glucose monitors.
- Do not get tattoos, piercings, or body art from an unlicensed facility or in an informal setting.

- Please note that bleach does not kill the hepatitis C virus; this is a common misconception.

HEPATITIS D - HDV

INTRODUCTION:

Hepatitis D (hepatitis delta) is a disease caused by the hepatitis D virus (HDV), a small spherical enveloped viroid that causes the liver to become inflamed. This swelling can impair liver function and cause long-term liver problems, including liver scarring and cancer. This virus is rare in the United States, but it's fairly common in the following regions:

- *South America*
- *West Africa*
- *Russia*
- *Pacific islands*
- *Central Asia*
- *Mediterranean*

HDV is considered to be a sub viral satellite because it can propagate only in the presence of the hepatitis B virus (HBV). Both super-infection and co-infection with HDV results in more severe complications compared to infection with HBV alone.

DEFINITION:

Hepatitis D is defined as the Liver inflammation due to the hepatitis D virus (HDV), which causes disease only in patients who additionally have the hepatitis B virus.

CAUSES:

The condition is caused by the hepatitis D virus (HDV) or Delta virus.

RISK FACTORS:

People are at an increased risk of getting hepatitis D who:

- *Have hepatitis B*
- *Are a man who has sex with other men*
- *Often receive blood transfusions*
- *Abuse injectable or intravenous (IV) drugs, such as heroin*

MODE OF TRANSMISSION:

Hepatitis D is caused by HDV. The infection is contagious and spread through direct contact with the bodily fluids of an infected person. It can be transmitted through:

- Urine
- Vaginal fluids
- Semen
- Blood
- Birth (from mother to her newborn)

Once you have hepatitis D, you can infect others even before your symptoms appear. However, you can only contract hepatitis D if you already have hepatitis B. According to the Children's Hospital of Philadelphia, approximately 5 percent of people with hepatitis B will go on to develop hepatitis D. You may develop hepatitis D at the same time you contract hepatitis B.

CLINICAL MANIFESTATIONS:

Hepatitis D doesn't always cause symptoms. When symptoms do occur, they often include:

- yellowing of the skin and eyes, which is called jaundice
- joint pain
- abdominal pain
- vomiting
- loss of appetite
- dark urine
- fatigue

The symptoms of hepatitis B and hepatitis D are similar, so it can be difficult to determine which disease is causing your symptoms. In some cases, hepatitis D can make the symptoms of hepatitis B worse. It can also cause symptoms in people who have hepatitis B but who never had symptoms.

DIAGNOSTIC TEST:

Call your doctor right away if you have symptoms of hepatitis D. If you have symptoms of the disease without jaundice, your doctor may not suspect hepatitis.

To make an accurate diagnosis, your doctor will perform a blood test that can detect anti-hepatitis D antibodies in your blood. If antibodies are found, it means you've been exposed to the virus.

Your doctor will also give you a liver function test if they suspect you have liver damage. This is a blood test that evaluates the health of your liver by measuring the levels of proteins, liver enzymes, and bilirubin in your blood. Results from the liver function test will show whether your liver is stressed or damaged.

MANAGEMENT:

There are no known treatments for acute or chronic hepatitis D. Unlike other forms of hepatitis, antiviral medications don't seem to be very effective in treating HDV. You may be given large doses of a medication called interferon for up to 12 months. Interferon is a type of protein that may stop the virus from spreading and lead to remission from the disease. However, even after treatment, people with hepatitis D can still test positive for the virus. This means that it's still important to use precautionary measures to prevent transmission. You should also remain proactive by watching for recurring symptoms.

If you have cirrhosis or another type of liver damage, you may need a liver transplant. A liver transplant is a major surgical operation that involves removing the damaged liver and replacing it with a healthy liver from a donor. In cases where a liver transplant is needed, approximately 78 percent of people live five years or longer after the operation.

COMPLICATIONS:

Hepatitis D isn't curable. Early diagnosis is essential in preventing liver damage. When the condition goes untreated, complications are more likely to occur. These include:

- Cirrhosis
- Liver disease
- Liver cancer

PREVENTION OF HEPATITIS

PREVENTION OF HEPATITIS A:

Vaccination: Hepatitis-A vaccine is an inactivated whole-virus vaccine used in infants, children and adolescents from 1 year up to and including 15 years providing active immunity against a future infection.

- The vaccine protects against the virus in more than 95% of cases for 10 years.
- The vaccine is given in two doses in the muscle of the upper arm. The first dose provides protection two to four weeks after initial vaccination; the second booster dose, given six to twelve months later, provides protection for up to twenty years.
- **Dose:** After 18 months, 2 doses at 6-12 months interval
- **Route:** The vaccine should be administered intramuscularly into the deltoid muscle.
- **Adverse Events:**
  - Very common (more than 1 in 10 doses of vaccine): Pain or discomfort at the injection site or redness, Tiredness, Irritability, Headache, Loss of appetite.
  - Common (up to 1 in 10 doses of vaccine): Swelling at the injection site, Fever (more than 38°C), Drowsiness, Stomach and digestive complaints
- **Additional side effects:**
  - Allergic reactions
  - Swelling of the eyes and face
  - Difficulty in breathing or swallowing
  - A sudden drop in blood pressure and loss of consciousness
  - Flu-like symptoms, including chills, and muscle and joint pains \
  - Bleeding or bruising more easily than normal due to a drop in a type of blood cell called platelets.
- If any of the side effects gets serious, or if you notice any side effects, call the doctor immediately.
- **Contraindications and Precautions:**
  - Hepatitis-A vaccine should not be given: If you previously had any allergic reaction to Hepatitis-A vaccine.
  - If you have/ your child has a severe infection with a high temperature. In these cases, the vaccination will be postponed until you/ your child has recovered.
  - Take special care with Hepatitis-A vaccine: If the patient has a bleeding problem or bruise/ bruises easily. Sometimes Hepatitis-A is given as an injection just under the skin instead of into muscle in people who have severe bleeding problems.
  - If the patient has a poor immune system due to illness or treatment or receiving haemodialysis. It may be necessary to do a blood test to see how well they have responded.

  - Pregnancy and breast-feeding: Hepatitis-A vaccine is not usually given to women who are pregnant or breast-feeding unless it is urgent for them to be vaccinated against both hepatitis A and B.
- ***Storage:***
  - Store in a refrigerator (2°C - 8°C).
  - Do not freeze. Freezing destroys the vaccine.
  - Store in the original package in order to protect from light.
  - Medicines should not be disposed of via wastewater or household waste. Ask your pharmacist how to dispose of medicines no longer required. These measures will help to protect the environment.
  - Do not use Hepatitis-A vaccine after the expiry date.
- **Hygiene:** Improved sanitation, food safety and immunization are the most effective ways to combat hepatitis A. The spread of hepatitis A can be reduced by:
  - adequate supplies of safe drinking water;
  - proper disposal of sewage within communities; and
  - personal hygiene practices such as regular hand-washing with safe water.
  - Hands should be washed thoroughly after every use of toilet.
  - Travelers should avoid water and ice if unsure of their purity.
  - Food handlers should carefully be screened.
  - Safe preparation and serving of food must be practiced.

PREVENTION OF HEPATITIS-E:

Vaccination: Currently there is no vaccine available for hepatitis E and because of this, it is sensible to take precautions when travelling to endemic areas or areas where the virus is known to occur.

- Practice good hygiene; always wash your hands properly after using the bathroom and before preparing or eating food.
- Use alcohol hand gel or 'baby-wipes' for cleaning hands if soap and water are not available.
- When travelling to an area where hepatitis E is common, avoid:
  - Drinking tap water (drink bottled water where possible)
  - Having ice cubes in drinks
  - Cleaning the teeth with tap water
  - Drinking unpasteurized milk
  - Eating uncooked meat and shellfish
  - Eating unpeeled fruit and uncooked vegetables, including salads, that have not been prepared by you.
  - Ensure you thoroughly cook all meat, especially pork, before eating it. Heating pork to an internal temperature of 71°C for 20 minutes is necessary to completely inactivate the hepatitis E virus (HEV).
  - Wash your hands after touching uncooked meat or meat products.

- ***Diet and Activity:***
  - The acute illness may result in anorexia, nausea, and vomiting, predisposing patients to dehydration. These symptoms tend to be worse in the afternoon or evening. Patients should attempt to ingest significant calories in the morning. As they improve, frequent small meals may be better tolerated. Hospitalization should be considered for patients with dehydration. Neither multivitamins nor specific dietary requirements are required.
  - Patients should be allowed to function at whatever activity levels they can tolerate. No evidence indicates that bed rest hastens recovery. However, patient should take rest during acute phase.

- ***Life Style Modifications:***
  - Alcohol: Stop drinking alcohol for the duration of infection (the whole time) as it can make the symptoms worse and can limit the effectiveness of anti-viral treatment.
  - Smoking: Smoking can increase the severity of liver damage. People with liver disease are more vulnerable to infection and to general poor health, so smoking or exposure to passive smoking is not advisable.
  - Diet: For most people with hepatitis E there is no special diet, however, eating a good, balanced diet is one of the most important things. Regular low-calorie meals containing protein (such as meat, fish or beans), starch (such as bread, potatoes or rice) and vitamins (in fruit and vegetables) is the best approach.
  - Exercise: Gentle exercise such as a regular walk or a gentle swim is advisable. Avoid strenuous exercise until after the symptoms have gone. The Department of Health recommends adults should take at least half an hour's gentle exercise a day, leaving you warm and slightly out of breath. You can do this all at once or, if you find it easier, in shorter 10 minute bouts. If you are overweight, the amount of exercise you do may need to be increased from 30 minutes to 45-90 minutes a day to help you to lose weight.

PREVENTION OF VIRAL HEPATITIS B:

Vaccination: The best way to prevent hepatitis B is by getting the hepatitis B vaccine. The hepatitis B vaccine is safe and effective and is usually given as 3-4 shots over a 6-month period.

- All infants, starting with the first dose of hepatitis B vaccine at birth
- All children and adolescents younger than 19 years of age who have not been vaccinated
- People whose sex partners have hepatitis B
- Sexually active persons who are not in a long-term, mutually monogamous relationship
- Persons seeking evaluation or treatment for a sexually transmitted disease
- Men who have sexual contact with other men

- People who share needles, syringes, or other drug-injection equipment
- People who have close household contact with someone infected with the hepatitis B virus
- Health care and public safety workers at risk for exposure to blood or blood-contaminated body fluids on the job
- People with end-stage renal disease, including predialysis, hemodialysis, peritoneal dialysis, and home dialysis patients
- Residents and staff of facilities for developmentally disabled persons
- Travellers to regions with moderate or high rates of hepatitis B
- People with chronic liver disease
- People with HIV infection
- People with diabetes aged 19 through 59 years and considered for people with diabetes 60 years or older
- Anyone who wishes to be protected from hepatitis B virus infection

  Dose and interval: Children and adolescents:

  Normily babies get 4 doses, if a combination vaccine (Catentabalent) containing hepatitis B is used.
  - 1st Dose: Birth
  - 2nd Dose: 6 week
  - 3rd Dose: 10 week
  - 4th Dose: 14 week
  - Anyone through 18 years of age who didn't get the vaccine when they were younger should also be vaccinated.
  - Adults: All unvaccinated adults at risk for hepatitis B infection should be vaccinated.
  - Other people may be encouraged by their doctor to get hepatitis B vaccine; for example, adults 60 and older with diabetes. Anyone else who wants to be protected from hepatitis B infection may get the vaccine.
  - Pregnant women who are at risk for one of the reasons stated above should be vaccinated. Other pregnant women who want protection may be vaccinated.
  - Adults getting hepatitis B vaccine should get 3 doses — with the second dose given 4 weeks after the first and the third dose 5 months after the second. Your doctor can tell you about other dosing schedules that might be used in certain circumstances.
- ***Contra-Indications:***
  - Anyone with a life-threatening allergy to yeast, or to any other component of the vaccine, should not get hepatitis B vaccine.
  - Anyone who has had a life-threatening allergic reaction to a previous dose of hepatitis B vaccine should not get another dose.
  - Anyone who is moderately or severely ill when a dose of vaccine is scheduled should probably wait until they recover before getting the vaccine.

- Note: You might be asked to wait 28 days before donating blood after getting hepatitis B vaccine. This is because the screening test could mistake vaccine in the bloodstream (which is not infectious) for hepatitis B infection.

- ***Side Effects:*** Hepatitis B is a very safe vaccine. Most people do not have any problems with it. The vaccine contains non-infectious material and cannot cause hepatitis B infection. Some mild problems have been reported:
  - Soreness where the shot was given (up to about 1 person in 4).
  - Temperature of 99.9°F or higher (up to about 1 person in 15).

    Severe problems are extremely rare. Severe allergic reactions are believed to occur about once in 1.1 million doses. Signs of a severe allergic reaction can include hives, swelling of the face and throat, difficulty breathing, a fast heartbeat, dizziness, and weakness. These would start a few minutes to a few hours after the vaccination. Call the doctor if severe allergic reactions are found.

Post-exposure Prophylaxis for Hepatitis B: Prophylactic treatment to prevent hepatitis B infection after exposure to HBV should be considered in the following situations.

- Perinatal exposure of an infant born to an HBsAg-positive mother,
- Accidental percutaneous or permucosal
- exposure to HBsAg-positive blood,
- Sexual exposure to an HBsAg-positive person, and household exposure of an infant less than 12 months of age to a primary care giver who has acute hepatitis B.
- For an infant with perinatal exposure to an HBsAg-positive and HBeAg-positive mother, a regimen combining one dose of HBIG at birth with the hepatitis B vaccine series started soon after birth is 85%-95% effective.
- For accidental percutaneous exposure, a regimen of two doses of HBIG, one given after exposure and one a month later, is about 75% effective in preventing hepatitis B in this setting.
- For sexual exposure, a single dose of HBIG is 75% effective if given within 2 weeks of last sexual exposure.

The efficacy of IG for post-exposure prophylaxis is uncertain. IG no longer has a role in post-exposure prophylaxis of hepatitis B because of the availability of HBIG and the wider use of hepatitis B vaccine.

PREVENTION OF VIRAL HEPATITIS C:

There is currently no vaccine available for protection against hepatitis C virus infection. People with hepatitis C should ensure they are vaccinated against hepatitis A and hepatitis B.

People with hepatitis C virus or at risk of infection with the virus should not donate blood, organs or other tissue. All donated blood and body organs are screened for hepatitis C virus.

Since the disease is spread through blood and body fluids, all the steps mentioned for prevention of hepatitis B are to be followed. These include hand hygiene, personal protective equipment, prevention of needle stick injury, proper disposal of contaminated equipment/waste, safe injection practices and environmental cleaning etc.

HAND HYGIENE AND PPE

HAND HYGIENE:

- Perform hand hygiene by means of hand rubbing or hand washing.
- Hands should always be washed with soap and water if hands are visibly soiled, or exposure to spore-forming organisms is proven or strongly suspected, or after using the restroom. For other indications, if resources permit, perform hand rubbing with an alcohol-based preparation.
- Hand washing (40–60 sec): wet hands and apply soap; rub all surfaces; rinse hands and dry thoroughly with a single use towel; use towel to turn off faucet.
- Hand rubbing (20–30 sec): apply enough product to cover all areas of the hands; rub hands until dry.
- Hand washing should be done
  - Before and after any direct patient contact and between patients, whether or not gloves are worn.
  - Immediately after gloves are removed.
  - Before handling an invasive device.
  - After touching blood, body fluids, secretions, excretions, non-intact skin, and contaminated items, even if gloves are worn.
  - During patient care, when moving from a contaminated to a clean body site of the patient.
  - After contact with inanimate objects in the immediate vicinity of the patient.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

- Assess the risk of exposure to body substances or contaminated surfaces before any health-care activity. Make this a routine!
- Select PPE based on the assessment of risk: Clean non-sterile gloves, Clean, non-sterile fluid-resistant gown, Mask and eye protection or a face shield.

- ***Gloves:***
  - Wear when touching blood, body fluids, secretions, excretions, mucous membranes, non-intact skin.
  - Change between tasks and procedures on the same patient after contact with potentially infectious material.
  - Remove after use, before touching non-contaminated items and surfaces, and before going to another patient.
  - Perform hand hygiene immediately after removal.

- ***Facial protection (Eyes, Nose, and Mouth):*** Wear a surgical or procedure mask and eye protection (face shield, goggles) to protect mucous membranes of the eyes, nose, and mouth during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.

- ***Gown:*** Wear to protect skin and prevent soiling of clothing during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions. Remove soiled gown as soon as possible and perform hand hygiene.

PREVENTION OF NEEDLE STICK INJURIES

Safe handling of needles and other sharp devices are components of standard precautions that are implemented to prevent health care worker exposure to blood borne pathogens.

- Use care when:
  - handling needles, scalpels, and other sharp instruments or devices
  - cleaning used instruments
  - disposing of used needles.
- The safety devices on needles and other sharps should be activated immediately after use.
- Used needles should be discarded immediately after use and not recapped, bent, cut, removed from the syringe or tube holder, or otherwise manipulated.
- Any used needles, lancets, or other contaminated sharps should be placed in a leak-proof, puncture-resistant sharps container that is either red in colour or labelled with a biohazard label.
- Do not overfill sharps containers. Discard after 2/3 full or when contents are at the full line indicated on the containers.
- Used sharps containers may be taken to a collection facility such as an area pharmacy, hospital, or clinic that provides this service.

ENVIRONMENTAL CLEANING:

Use adequate procedures for the routine cleaning and disinfection of environmental and other frequently touched surfaces.

WASTE DISPOSAL:

- Ensure safe waste management.
- Treat waste contaminated with blood, body fluids, secretions and excretions as clinical waste, in accordance with local regulations.
- Human tissues and laboratory waste that is directly associated with specimen processing should also be treated as clinical waste.

PATIENT CARE EQUIPMENT:

- Handle equipment soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of pathogens to other patients or the environment.
- Clean, disinfect, and reprocess reusable equipment appropriately before use with another patient.

An organization's culture may need to shift from thinking that only infection preventionists are accountable for infection prevention and presents all healthcare workers with an infection prevention opportunity. All caregivers are accountable and to encourage infection prevention protocols, healthcare professionals should show appreciation for all the people who help keep infections at bay.

SAFE INJECTION PRACTICES:

Injection safety, or safe injection practices, is a set of measures taken to perform injections in an optimally safe manner for patients, healthcare personnel, and others. A safe injection does not harm the recipient, does not expose the provider to any avoidable risks, and does not result in waste that is dangerous for the community (e.g., through inappropriate disposal of injection equipment).

Injection safety includes practices intended to prevent transmission of infectious diseases between one patient and another, or between a patient and healthcare provider, and also to prevent harms such as needle stick injuries.

ROLE OF NURSES

A nurse plays a very critical role in dealing patients and family with viral hepatitis. The role of nurses will include:

- Screening clients at risk of hepatitis infection
- Educating clients and partners/relatives/friends about Hepatitis after a positive diagnosis
- Taking a thorough medical history, which includes assessing pre-existing conditions and looking for signs of extra-hepatic manifestations of viruses and cirrhosis or decompensated liver disease
- Liaising with other health professionals involved in clients' care, which is particularly important for managing side effects.
- Closely monitoring treatment efficacy and side-effects according to a treatment protocol
- Providing education to other health professionals (such as general nurses and midwives) to increase awareness of the disease.

PATIENT COUNSELLING:

Counselling patients with hepatitis infections is often the most difficult aspect of patient management for a number of reasons. Despite the limitations, important, useful, and relevant information can be transmitted to most patients within the final three to five minutes of the patient visit for consistency.

KEY COUNSELLOR GOALS:

- Ensuring the safety of clients.
- Providing reliable information to clients and their families.
- Building the therapeutic relationship with clients.
- Helping clients understand their diagnoses.
- Incorporating client needs in substance abuse treatment planning.
- Developing a prevention plan.
- Using motivational interviewing.
- Confronting the social ramifications of hepatitis.
- Addressing relapse issues.
- Building support.
- Providing case management.

PATIENT COUNSELLING TOPICS:

- Disease itself – prevalence, natural history, treatment
- Impact of Disease on Patient - daily activities, exercise/rest, food, alcohol, further investigations
- Transmission - general, sexual/intimate, children, blood/organ donation
- Family Screening – indications, explanations.

SPECIFIC ADVICES: *Clients are advised:*

- Not to share any injecting equipment such as needles and syringes
- Not to donate blood nor carry a donor card
- Not to share razors, toothbrushes or anything else that may possibly be contaminated with blood
- To use condoms when having sex. The risk of passing on the hepatitis C virus during sex is small but is reduced even further by using condoms. However, partners in regular monogamous relationships may accept the small risk of having sex without condoms.

NURSING CARE PLAN FOR A PATIENT WIT HEPATITIS:

- **Nursing Priorities:**
  - Reduce demands on liver while promoting physical well-being.
  - Prevent complications.
  - Enhance self-concept, acceptance of situation.
  - Provide information about disease process, prognosis, and treatment needs.

- **Discharge Goals:**
  - Meeting basic self-care needs.
  - Complications prevented/minimized.
  - Dealing with reality of current situation.
  - Disease process, prognosis, and therapeutic regimen understood.
  - Plan in place to meet needs after discharge.

Nursing care plan includes:

1 Imbalanced Nutrition:

- **Nursing Diagnosis**
  - Nutrition: imbalanced, less than body requirements

- **May be related to**
  - Insufficient intake to meet metabolic demands: anorexia, nausea/vomiting
  - Altered absorption and metabolism of ingested foods: reduced peristalsis (visceral reflexes), bile stasis
  - Increased calorie needs/hypermetabolic state

- **Possibly evidenced by**
  - Aversion to eating/lack of interest in food; altered taste sensation
  - Abdominal pain/cramping
  - Loss of weight; poor muscle tone

- **Desired Outcomes**
  - Initiate behaviors, lifestyle changes to regain/maintain appropriate weight.
  - Demonstrate progressive weight gain toward goal with normalization of laboratory values and no signs of malnutrition.

- **Nursing Interventions**
  - Monitor dietary intake and caloric count.
  - Suggest several small feedings and offer "largest" meal at breakfast.
  - Encourage mouth care before meals.
  - Recommend eating in upright position.
  - Encourage intake of fruit juices, carbonated beverages, and hard candy throughout the day.
  - Consult with dietitian, nutritional support team to provide diet according to patient's needs, with fat and protein intake as tolerated.
  - Monitor serum glucose as indicated.
  - Administer medications as indicated: Antiemetics, Antacids, Vitamin Supplements Etc.
  - Provide supplemental feedings and TPN if needed.

2 Deficient Fluid Volume

- **Nursing Diagnosis:** Risk for Deficient Fluid Volume
- **Risk factors may include**
  - Excessive losses through vomiting and diarrhea, third-space shift
  - Altered clotting process

- **Possibly evidenced by**
  - Not applicable. A risk diagnosis is not evidenced by signs and symptoms, as the problem has not occurred and nursing interventions are directed at prevention.

- **Desired Outcomes**
  - Maintain adequate hydration, as evidenced by stable vital signs, good skin turgor, capillary refill, strong peripheral pulses, and individually appropriate urinary output.
  - Be free of signs of hemorrhage with clotting times WNL.

- **Nursing Interventions**
  - Monitor intake & output, compare with periodic weight. Note enteric losses: vomiting and diarrhea.
  - Assess vital signs, peripheral pulses, capillary refill, skin turgor, and mucous membranes.

- Check for ascites or edema formation. Measure abdominal girth as indicated.
- Use small-gauge needles for injections, applying pressure for longer than usual after venipuncture.
- Have patient use cotton or sponge swabs and mouthwash instead of toothbrush or use soft bristled toothbrush.
- Observe for signs of bleeding: hematuria, melena, ecchymosis, oozing from gums, puncture sites
- Monitor periodic laboratory values: Hb/Hct, Na, albumin, and clotting times.
- Provide IV fluids (usually glucose), electrolytes. Protein hydrolysates.

- **Administer medications as indicated:**
  - Vitamin K, Antacids or H2-receptor antagonists.
  - Infuse fresh frozen plasma, as indicated.

3. Fatigue

- **Nursing Diagnosis:** Fatigue
- **May be related to**
  - Decreased metabolic energy production
  - States of discomfort
  - Altered body chemistry (e.g., changes in liver function, effect on target organs)

- **Possibly evidenced by**
  - Reports of lack of energy/inability to maintain usual routines.
  - Decreased performance
  - Increase in physical complaints

- **Desired Outcomes**
  - Report improved sense of energy.
  - Perform ADLs and participate in desired activities at level of ability.

- **Nursing Interventions**
  - Institute bed red or chair rest during toxic state. Provide quiet environment; limit visitors as needed.
  - Recommend changing position frequently. Provide and instruct caregiver in good skin care.
  - Do necessary tasks quickly and at one time as tolerated.
  - Determine and prioritize role responsibilities and alternative providers and possible community resources available
  - Identify energy-conserving techniques: sitting to shower and brush teeth, planning steps of activity so that all needed materials are at hand, scheduling rest periods.
  - Increase activity as tolerated, demonstrate passive or active ROM exercises.
  - Encourage use of stress management techniques: progressive relaxation, visualization, guided imagery. Discuss appropriate diversional activities: radio,

TV, reading.
- Monitor for recurrence of anorexia and liver tenderness or enlargement.
- Administer medications as indicated: sedatives, antianxiety agents
- Monitor serial liver enzyme levels.

4. Impaired Skin Integrity

- **Nursing Diagnosis:** Risk for Impaired Skin Integrity
- **Risk factors may include**

  Chemical substance: bile salt accumulation in the tissues

- **Possibly evidenced by**

  Not applicable. A risk diagnosis is not evidenced by signs and symptoms, as the problem has not occurred and nursing interventions are directed at prevention.

- **Desired Outcomes**
  - Display intact skin/tissues, free of excoriation.
  - Report absence/decrease of pruritus/scratching.

- **Nursing Interventions:**
  - Encourage use of cool showers and baking soda or starch baths. Avoid use of alkaline soaps. Apply calamine lotion as indicated.
  - Provide diversional activities
  - Suggest use of knuckles if desire to scratch is uncontrollable. Keep fingernails cut short, apply gloves on comatose patient or during hours of sleep. Recommend loose-fitting clothing. Provide soft cotton linens.
  - Provide a soothing massage at bedtime.
  - Observe skin for areas of redness, breakdown.
  - Avoid comments regarding patient's appearance
  - Administer medications as indicated: Antihistamines, Antilipemic: cholestyramine

5. Knowledge Deficit

- **Nursing Diagnosis:** Knowledge Deficit

- **May be related to**
  - Lack of exposure/recall; information misinterpretation
  - Unfamiliarity with resources

- **Possibly evidenced by**
  - Questions or statements of misconception; request for information
  - Inaccurate follow-through of instructions; development of preventable complications

- **Desired Outcomes**
  - Verbalize understanding of disease process, prognosis, and potential complications.
  - Identify relationship of signs/symptoms to the disease and correlate symptoms with causative factors.
  - Verbalize understanding of therapeutic needs.
  - Initiate necessary lifestyle changes and participate in treatment regimen.

- **Nursing Interventions**
  - Assess level of understanding of the disease process, expectations and prognosis, possible treatment options.
  - Provide specific information regarding prevention and transmission of disease: contacts may require gamma-globulin; personal items should not be shared; observe strict hand washing and sanitizing of clothes, dishes, and toilet facilities while liver enzymes are elevated. Avoid intimate contact, such as kissing and sexual contact, and exposure to infections, especially URI.
  - Plan resumption of activity as tolerated with adequate periods of rest. Discuss restriction of heavy lifting, strenuous exercise and/or contact sport.
  - Help patient identify appropriate diversional activities.
  - Identify ways to maintain usual bowel function: adequate intake of fluids and dietary roughage, moderate activity and exercise to tolerance.
  - Discuss the side effects and dangers of taking OTC and prescribed drugs (acetaminophen, aspirin, sulfonamides, some anesthetics) and necessity of notifying future healthcare providers of diagnosis.
  - Discuss restrictions on donating blood.
  - Emphasize importance of follow-up physical examination and laboratory evaluation
  - Review necessity of avoidance of alcohol
  - Refer to community resources, drug/alcohol treatment program as indicated.

6. Low Self-Esteem

- **Nursing Diagnosis:** Situational Low Self-Esteem

- **May be related to**
  - Annoying/debilitating symptoms, confinement/isolation, length of illness/recovery period

- **Possibly evidenced by**
  - Verbalization of change in lifestyle; fear of rejection/reaction of others, negative feelings about body; feelings of helplessness
  - Depression, lack of follow-through, self-destructive behavior

- **Desired Outcomes**
  - Verbalize feelings.
  - Identify feelings and methods for coping with negative perception of self.
  - Verbalize acceptance of self in situation, including length of recovery/need for isolation.
  - Acknowledge self as worthwhile; be responsible for self.

7. Risk for Infection

- **Nursing Diagnosis:** Risk for Infection
- **Risk factors may include**
  - Inadequate secondary defenses (e.g., leukopenia, suppressed inflammatory response) and immunosuppression
  - Malnutrition
  - Insufficient knowledge to avoid exposure to pathogens
- **Desired Outcomes**
  - Verbalize understanding of individual causative/risk factor(s).
  - Demonstrate techniques; initiate lifestyle changes to avoid reinfection or transmission to others.
  - **Other Possible Nursing Diagnoses:** Fatigue—generalized weakness, decreased strength/endurance, pain, imposed activity restrictions, depression.
  - Home Maintenance, impaired—prolonged recovery/chronic condition, insufficient finances, inadequate support systems, unfamiliarity with neighborhood resources.
  - Nutrition: imbalanced, less than body requirements—insufficient intake to meet metabolic demands: anorexia, nausea/vomiting; altered absorption and metabolism of ingested foods; increased calorie needs/hypermetabolic state.
  - Infection, risk for—inadequate secondary defenses; malnutrition; insufficient knowledge to avoid exposure to pathogens.

STATUTORY REQUIREMENTS REGARDING DISEASE REPORTING:

- Hepatitis A (acute) should be reported to the district health office immediately.
- Hepatitis B -acute hepatitis B -newly identified HbsAg+ carriers - HbsAg + pregnant women hepatitis c virus infection (past or present) should be reported within 7 days

CONCLUSION:

The marginalized populations with viral hepatitis are complex, time consuming and resource intensive. The nurse works with patients in a variety of settings including community or public health, street outreach clinics, correction facilities, private physicians' offices, hospitals and academic centres. Because of new developments in antiviral therapy for hepatitis, the nurses have an important role in the multidisciplinary team for management of hepatitis. They go an extra mile in providing support, education, counselling and referrals that provide the greatest opportunity for staying on treatment and receiving care and are the Health Care Ambassadors.

PATIENT SECURITY AND COPYRIGHT ISSUES

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Patient Security & Copyright Issues

The main subject of this project is to enhance medical education in the field of liver diseases. The contents of this project do not include any patient related information, and we pay careful attention to protecting patient privacy by for example, not disclosing patient identity in our presentations and avoiding photographing patient faces in presentations. Therefore, our basis standpoint is that there is no need for further protection during transmission of the lectures during face to face conferences or over the internet. This being a learning program, ILBS or any of its faculty or project PRAKASH staff will not be liable or legally accountable for any clinical or administrative, management complications and or any mishap that arise in any patient. It shall be the responsibility of the participating doctor/nurse to utilize his/her skills and acumen for rendering most appropriate and ethical treatment to his/her patients.


What Is Viral Hepatitis
• Hepatitis means inflammation of the liver
–Hepat (liver) + itis (inflammation)= Hepatitis
• Viral hepatitis means inflammation (swelled or enlarged) liver due to hepatitis viruses

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PROJECT PRAKASH

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