

Alaska Liver Disease ECHO



This project is supported by a grant from the Northwest Portland Area Indian Health Board and funding is provided from the HHS Secretary's Minority HIV/AIDS Fund.

WHAT WE DO

- We're accepting **case presentations and questions pertaining to:**
 - Elevated Liver Function Tests
 - Cirrhosis
 - Managing Complications of Decompensated Cirrhosis – Ascites, encephalopathy, esophageal varices
 - Alcohol-related liver disease, including Alcohol Hepatitis
 - Autoimmune liver disease – Autoimmune Hepatitis, Primary Biliary Cholangitis, Overlap
 - Nonalcoholic fatty liver disease/Nonalcoholic steatohepatitis
 - Hepatocellular carcinoma
- Provide Expert Panelists
- Didactic Presentations pertaining to ECHO topics

CONSULTANT TEAM

- Brian McMahon, MD Hepatologist
- Youssef Barbour, MD Hepatologist
- Lisa Townshend, ANP Hepatology Provider
- Annette Hewitt, ANP Hepatology Provider
- Leah Besh, PA-C HIV/Hepatology Provider
- Anne Fleetwood, MS, RDN, NDN
- Brittany Keener, PharmD, MPH, BCPS
- Lucia Neander, PhD Clinical Psychologist

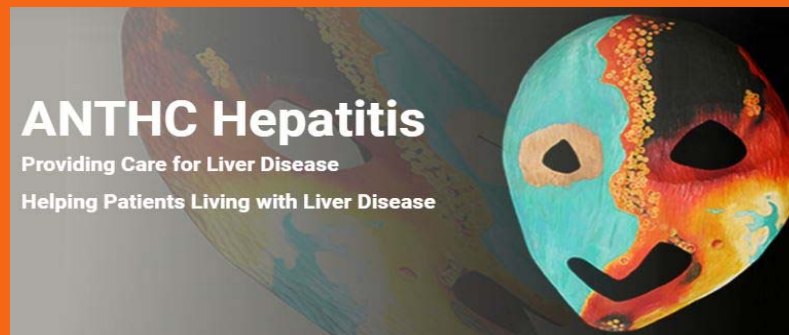


LIVER DISEASE ECHO SCHEDULE AT A GLANCE

- Feb 18th Physiology of the Liver – Youssef Barbour, MD
- March 18th Evaluating Abnormal Liver Function Tests – Brian McMahon, MD
- April 15th Noninvasive Markers for Liver Fibrosis – Brian McMahon, MD
- May 21st Management of Ascites – Youssef Barbour, MD
- June 17th Motivational Interviewing – Lucia Neander, PhD
- July 15th Nutrition for the Liver – Anne Fleetwood, MS, RDN, CDCES
- August 19th Drug Induced Liver Injury – Brittney Keener, MPH, BCPS

ADDITIONAL LEARNING OPPORTUNITIES

- ANTHC ID ECHO: HCV, HIV, STI, PrEP/PeP
 - The 2nd Tuesday of every month from 12:00-1:00PM Alaska Standard Time
 - 1CE/CME offered per session
 - anthc.org/hep
- LiverConnect Webinar Program
 - Second Tuesday of every month 8:00-9:00AM Alaska Standard Time
 - Full Hour didactic topics on Liver Disease and related topics 1CE/CME offered
 - anthc.org/what-we-do/clinical-and-research-services/hep/liverconnect/



AK LIVER DISEASE ECHO –CONTINUING EDUCATION

Continuing education credit is not available today.

Expected steps for CEs:

1. Attendance: you will be asked to change your Zoom participant name to reflect your: first and last name, (community, state).
2. CE information and disclosures: this information will be shared on a slide at the beginning of each ECHO.
3. Polls: a pre-test and post-test poll will be shared, please participate!
4. Evaluations: the evaluation link will be shared towards the end of each ECHO.
5. Certificates: will be sent via email after the completion of the evaluation.



AK LIVER DISEASE ECHO -TEAM CONTACTS

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- Cindy Decker, RN Liver Disease ECHO Nurse Case Manager, cadecker@anthc.org
- ANTHC Liver Disease and Hepatitis Program: 907-729-1560
- Northwest Portland Area Indian Health Board
 - David Stephens: Director Indian Country ECHO, dstephens@npaihb.org
 - Jessica Leston: Clinical Programs Director, jleston@npaihb.org



Basic physiology of the

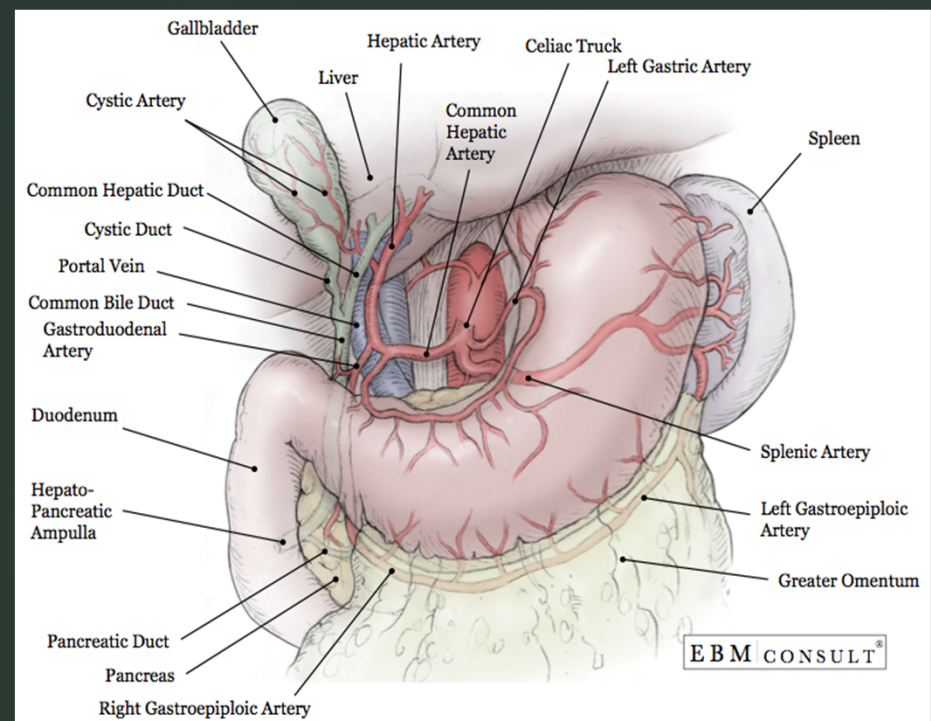
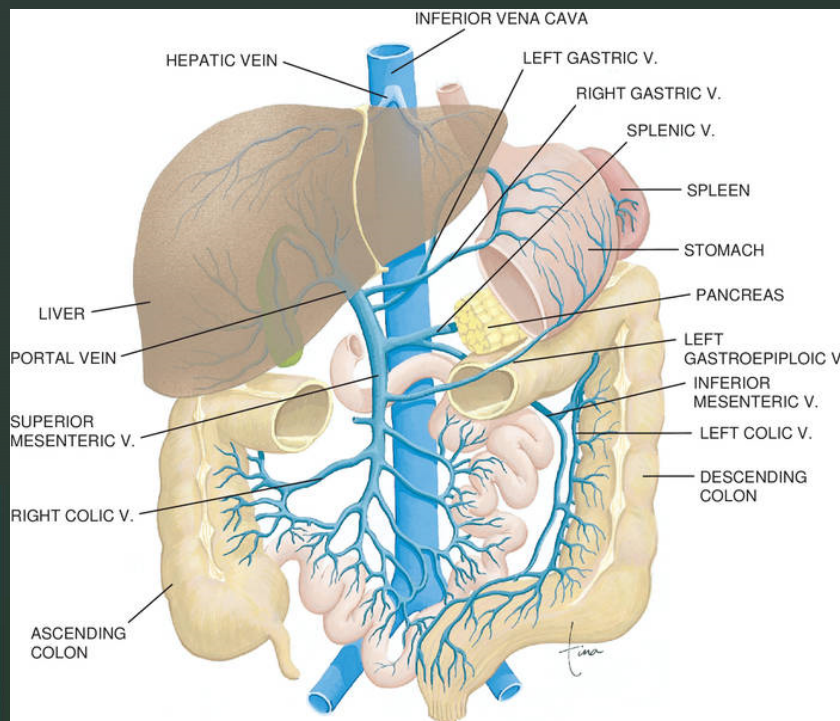
LIVER



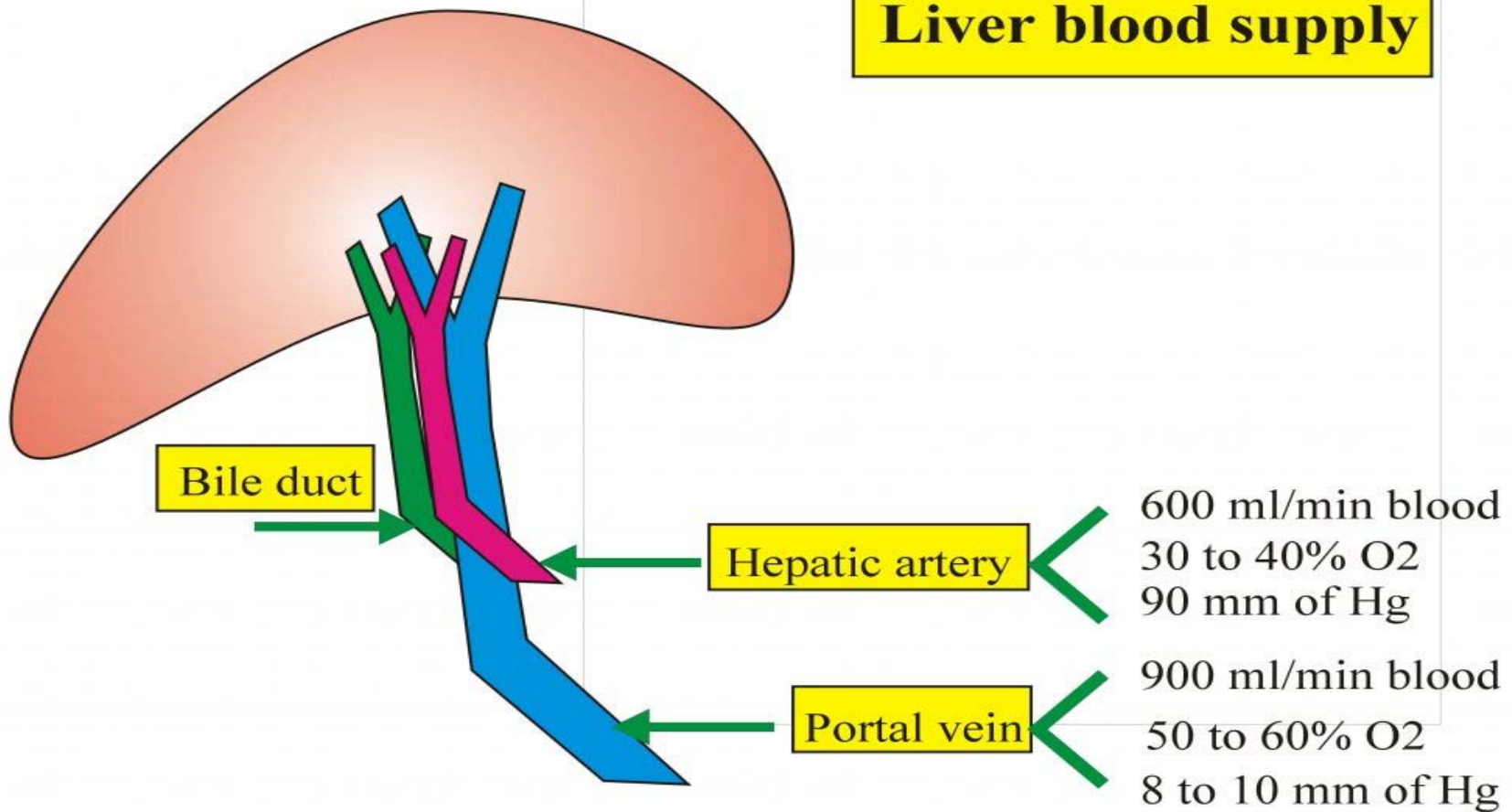
Youssef Barbour M.D

➤ No conflict of interests to disclose

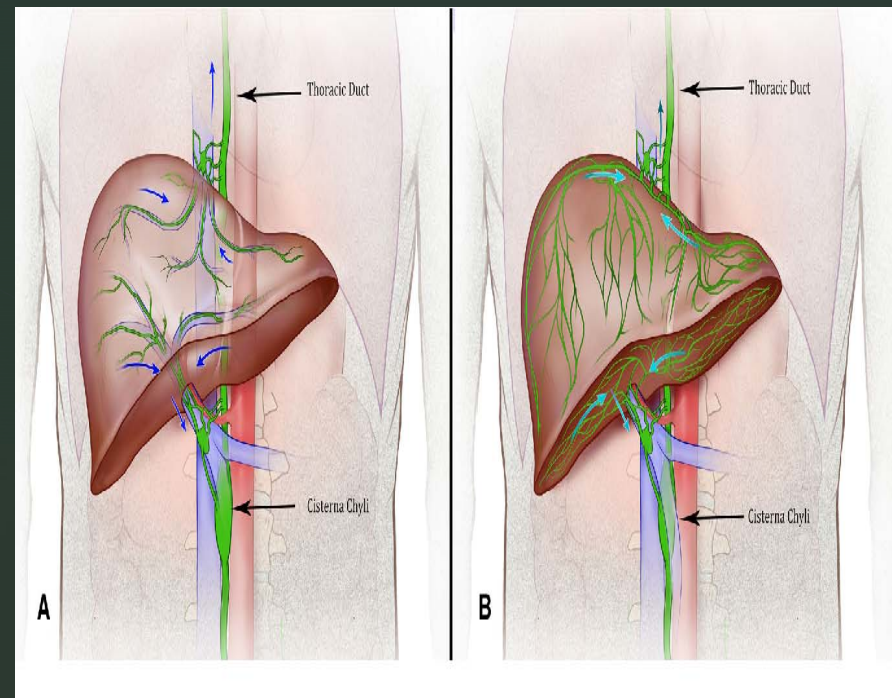
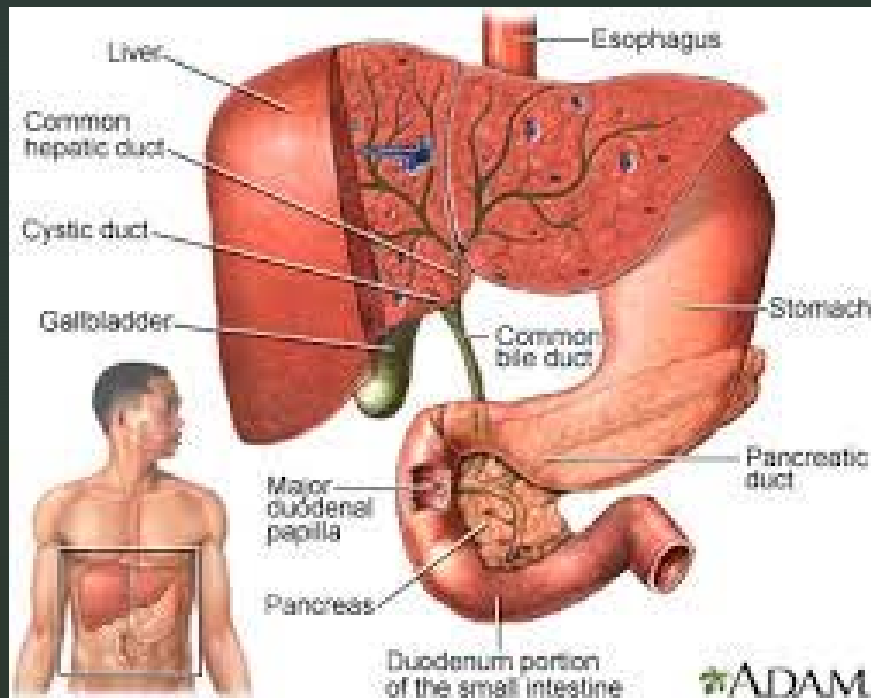
Blood supply and return in the liver



Liver blood supply



Liver Bile production, and lymph circulation



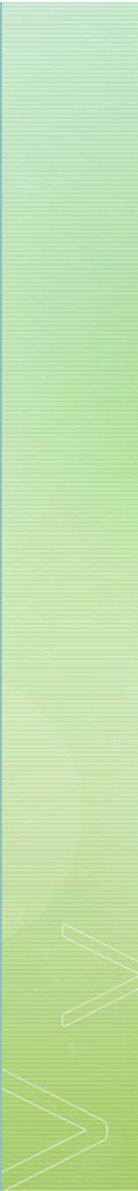


Basic physiology in the liver

- Second largest organ in the body after the skin (the largest internal organ)
- Heaviest organ in the body
- Receives the largest portion of cardiac output (27% of cardiac output, 1.35 l/m)
- Consumes the largest amount of oxygen at rest
- 60% of protein coding genes are expressed in a normal adult liver
- The liver is thought to be responsible for up to 500 separate functions usually in combination with other systems and organs
- Currently, no artificial organ or device is capable of reproducing all the vital functions of the liver



Liver Functions

- 1- synthesis
 - 2- break down
 - 3- storage
 - 4- immunity
- 

Synthesis

- Macronutrients (carbohydrates, proteins, and lipids)
- Some coagulations factors, and anticoagulation factors
- Cholesterol, many hormones built from cholesterol
- Bile, digestion of fat in the duodenum, and neutralizing acid from stomach
- Angiotensinogen, important to raise blood pressure
- Thrombopoietin, regulate platelet production in bone marrow
- Insulin-like growth factor 1, important for childhood growth.
- Acute phase reactive proteins which mediate inflammatory response
- Albumin: maintain blood oncotic pressure, transport fatty acids and steroid

Break down

- Macronutrients (carbohydrates, protein, lipids)
- Phase 1 and phase 2 metabolism (drug metabolism)
- Liver oxidative capacity decreases with aging, so drugs that depend on this process (e.g.; benzodiazepines) accumulate in the body, leading to overdose effects
- Break down of insulin and other hormones
- Break down of bilirubin (glucuronidation), then excreted via bile
- Break down of ammonia into urea as part of urea cycle
- Catalyzing hydrogen peroxide (free radicals, oxidants) into water and oxygen
- Phagocytosis and elimination of infections

Storage

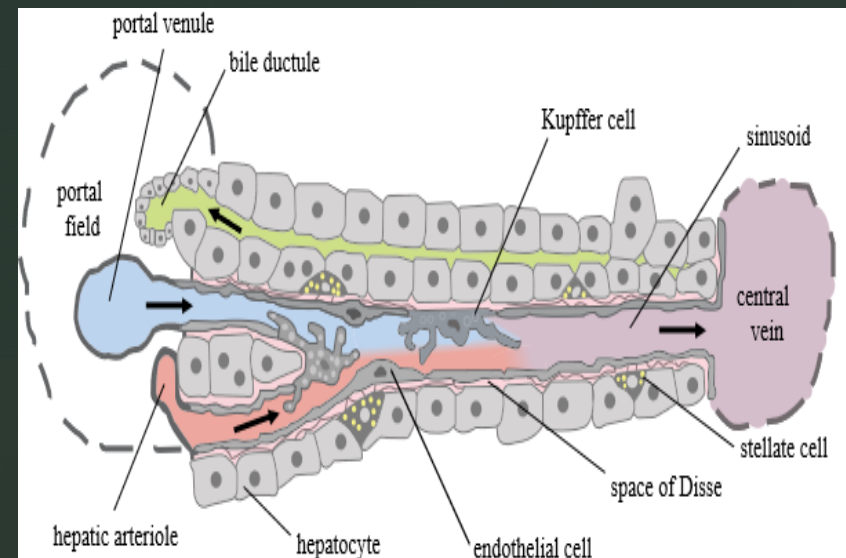
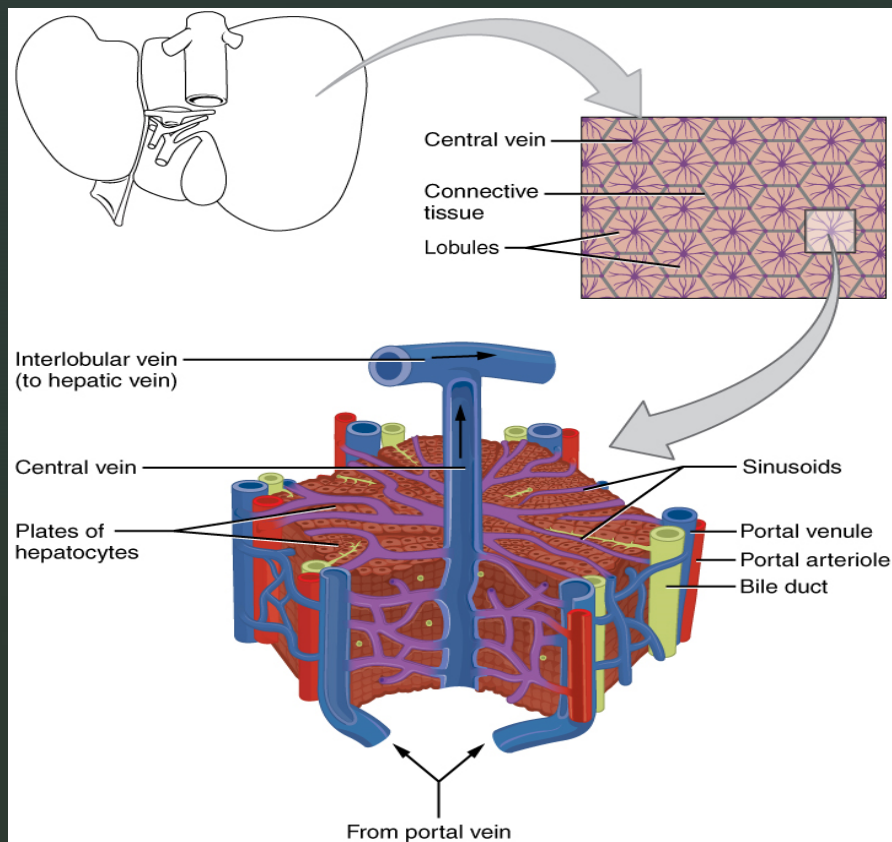
- Glucose in the form of glycogen
- Vitamin A (1-2 years supply)
- Vitamin D (1-4 months supply)
- Vitamin B12 (3-5 years supply)
- Vitamin K
- Iron
- Copper



Immunity

- Liver immune role is very complex to balance between *immune tolerance* to strange antigens, and the ability to eliminate a lot of toxic materials through *phagocytosis* and *adaptive immune responses*.
- Liver plays main role leading to septic shock in endotoxemia

Under the microscope



Laboratory tests

Liver enzymes (ALT,AST,ALP,GGT,Bilirubin)

- ALT vs ALP ratio differentiate hepatocellular vs. Cholestatic
- ALT vs. AST ratio differentiate alcoholic injury vs. not alcohol related
- Bilirubin can increase in both

Liver synthetic functions tests (Albumin,Bilirubin,INR)

- Helpful in the staging of liver cirrhosis diagnosis
- Become abnormal in severe acute liver injury/failure



Imaging testing

Ultrasound

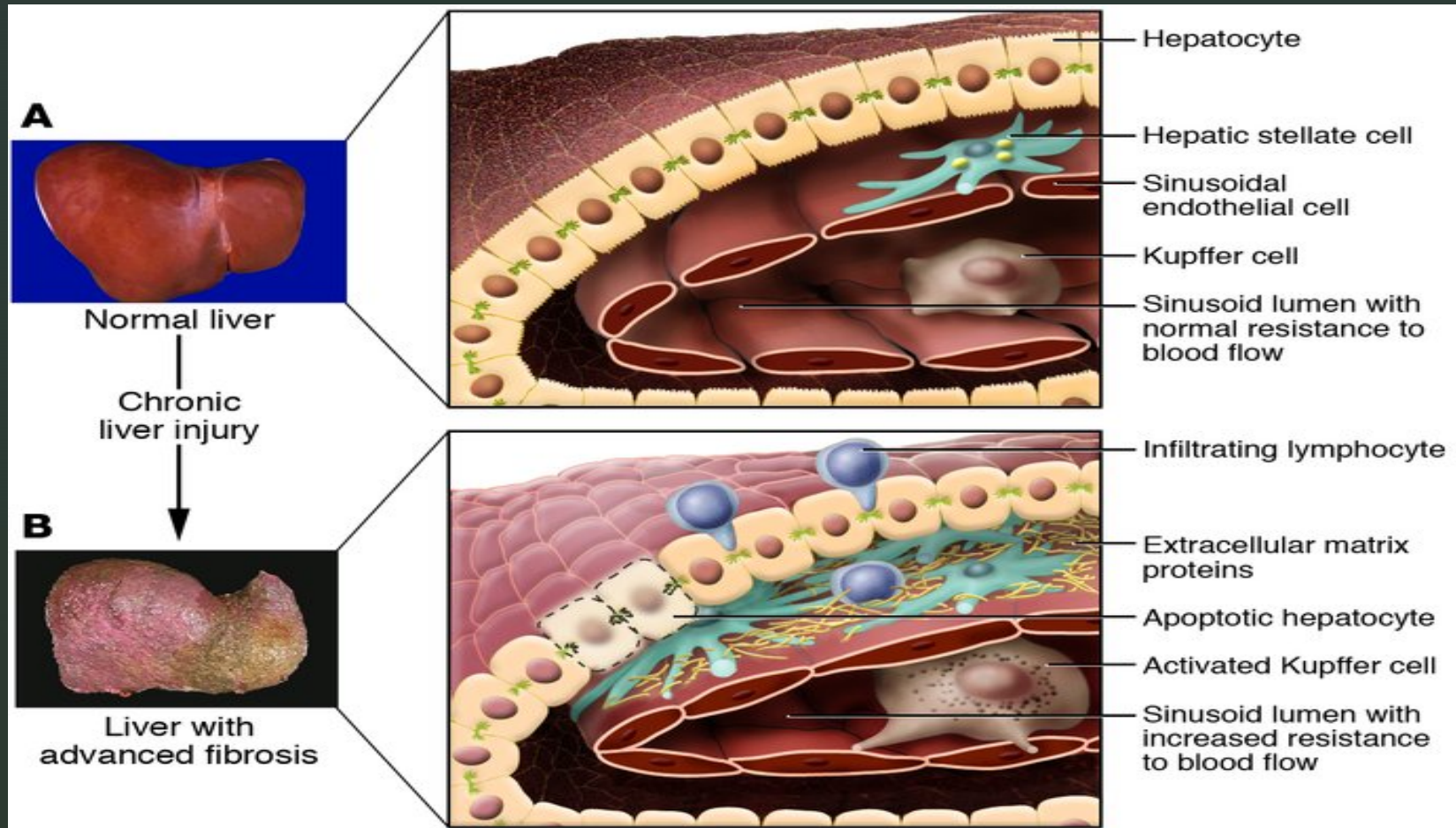
CT scan

MRI

MRCP

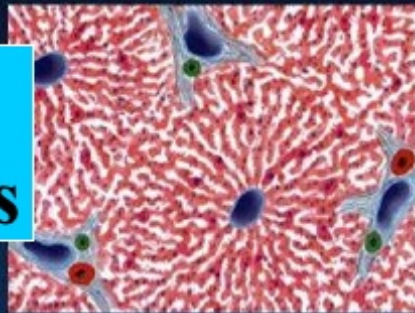
- Very helpful in cholestatic liver injuries to identify obstruction
- Very helpful in identifying liver cirrhosis
- Very helpful in differentiating liver lesions and diagnosing liver cancer (HCC) even without a biopsy

Liver cirrhosis

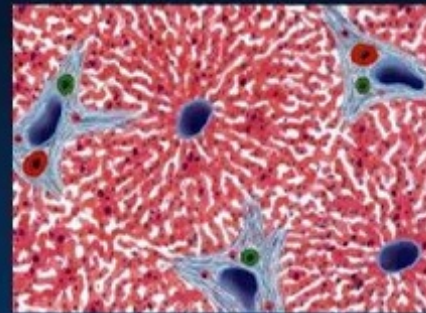


Liver Biopsy by Stage

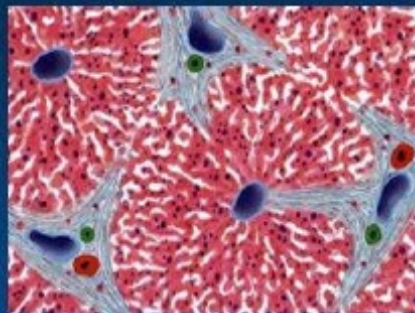
Stage 1



Stage 2



Stage 3



Stage 4



**Mild
Fibrosis**

Cirrhosis



Questions?

Thank you!!!