Sarcoidosis

Liver, Spleen, and Gastrointestinal Tract

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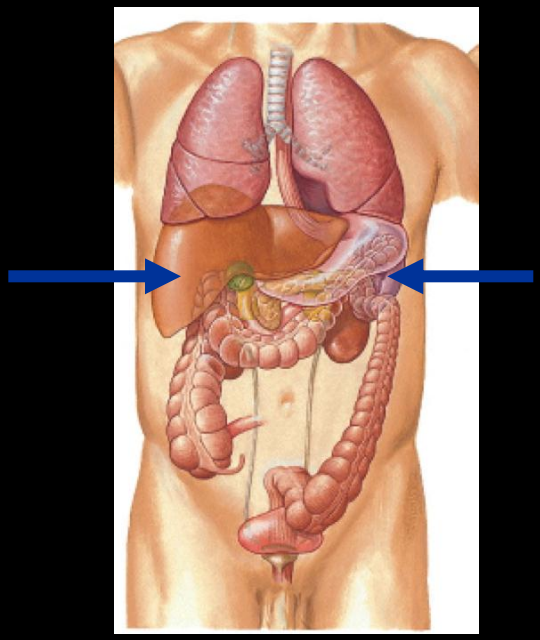
Diagnosis: Hepatosplenic Sarcoidosis

- Granulomas in liver or spleen (usually presumptive!)
- Presence of granulomas in alternative organ
- Exclude all other causes

Without Liver biopsy*:

Definite:
LFTs >3X normal

Probable:
1. CT scan compatible
2. Elevated Alk Phos

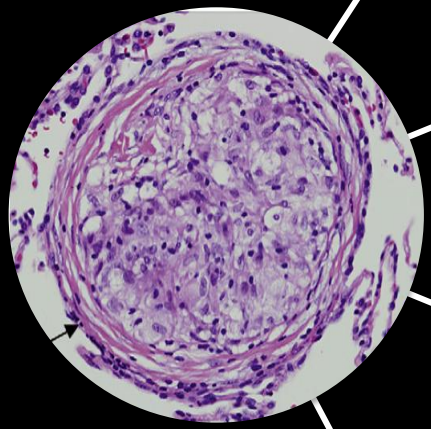


Without Spleen biopsy*:

Probable:
1. Enlargement on Exam
2. Splenomegaly on CT scan
3. Positive radioisotope exam

*Judson et al. Defining Organ Involvement in Sarcoidosis: the ACCESS Proposed Instrument. 1999.

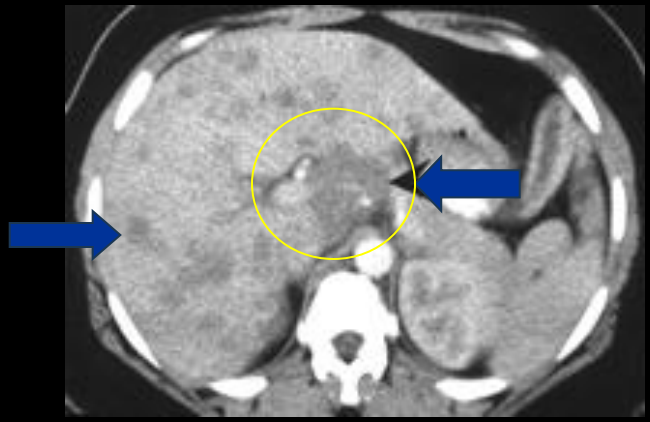
Differential Diagnosis of Hepatic Granulomas

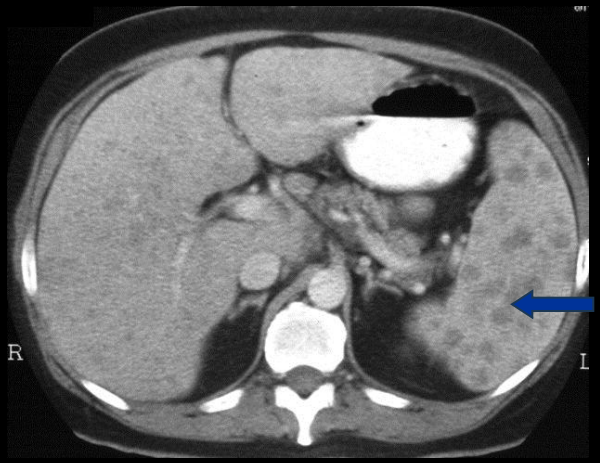


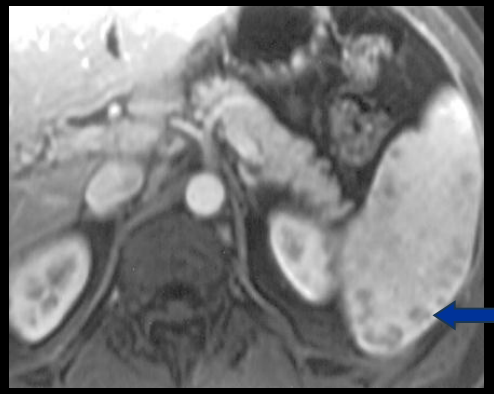
- Infection
  - Viral, Fungal, Bacterial
  - Parasite or Protozoa
- Drugs, Chemicals
  - Antibiotics, OCP, ASA, Quinidine, Phenylbutazone, TNF inhibitors
- Primary Liver Disease
  - Primary Biliary Cirrhosis, Sclerosing Cholangitis
- Other Systemic Illnesses
  - IBD, CGD, Ig Deficiencies, Wegener's, SLE, Malignancy,

Hepatosplenic Sarcoidosis: Radiological Manifestations

- Splenomegaly >Hepatomegaly
- Diffuse, homogeneous
- Hepatic or Splenic Nodules
  - CT Scan: **HYPODENSE**
    - Low Attenuation nodules (0.3mm-2cm)
    - Multiple or Innumerable
  - Ultrasound: **HYPOECHOIC**
    - May be hyperechoic if liver background affected by fibrosis
    - 46%-59% sensitive in hepatic sarcoidosis
  - MRI (T1/T2): **HYPOINTENSE**
    - Can enhance minimally on delayed phase contrast enhanced imaging.



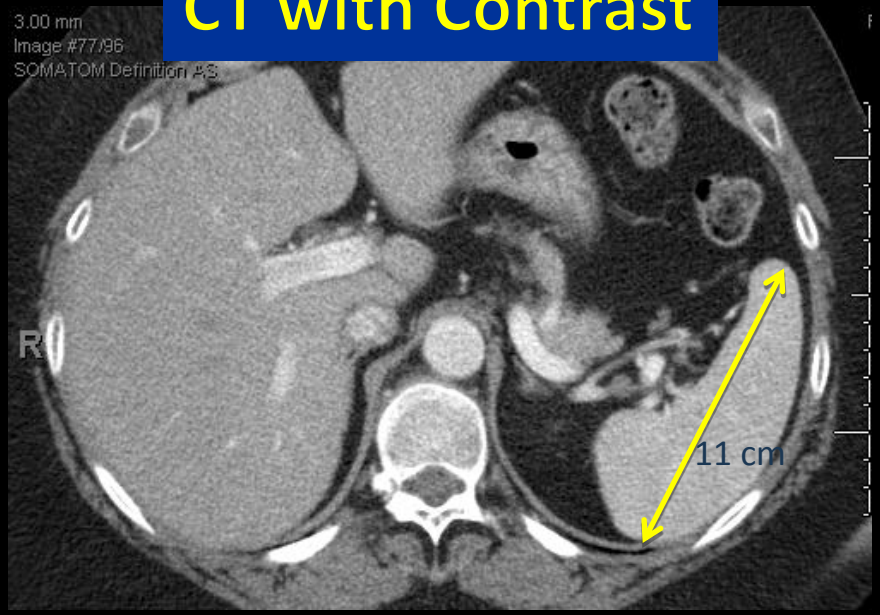




Warshauer D M , Lee J K T AJR 2004;182:15-28
Warshauer DM. “Splenic Sarcoidosis”. Sem in Ultrasound, CT, and MRI, 2007.

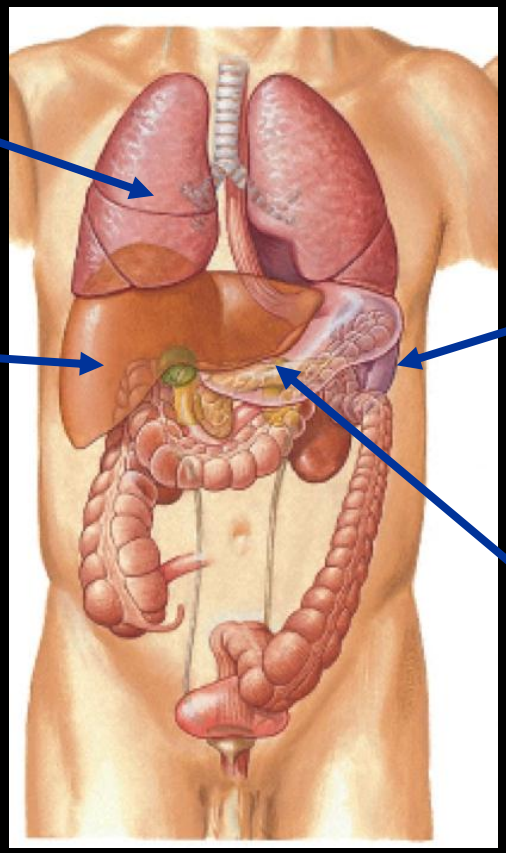
PET CT

CT with Contrast



Prevalence: ACCESS Study

Lung 95%



Spleen 7%

Liver 12%*

*[1] African American > Caucasian

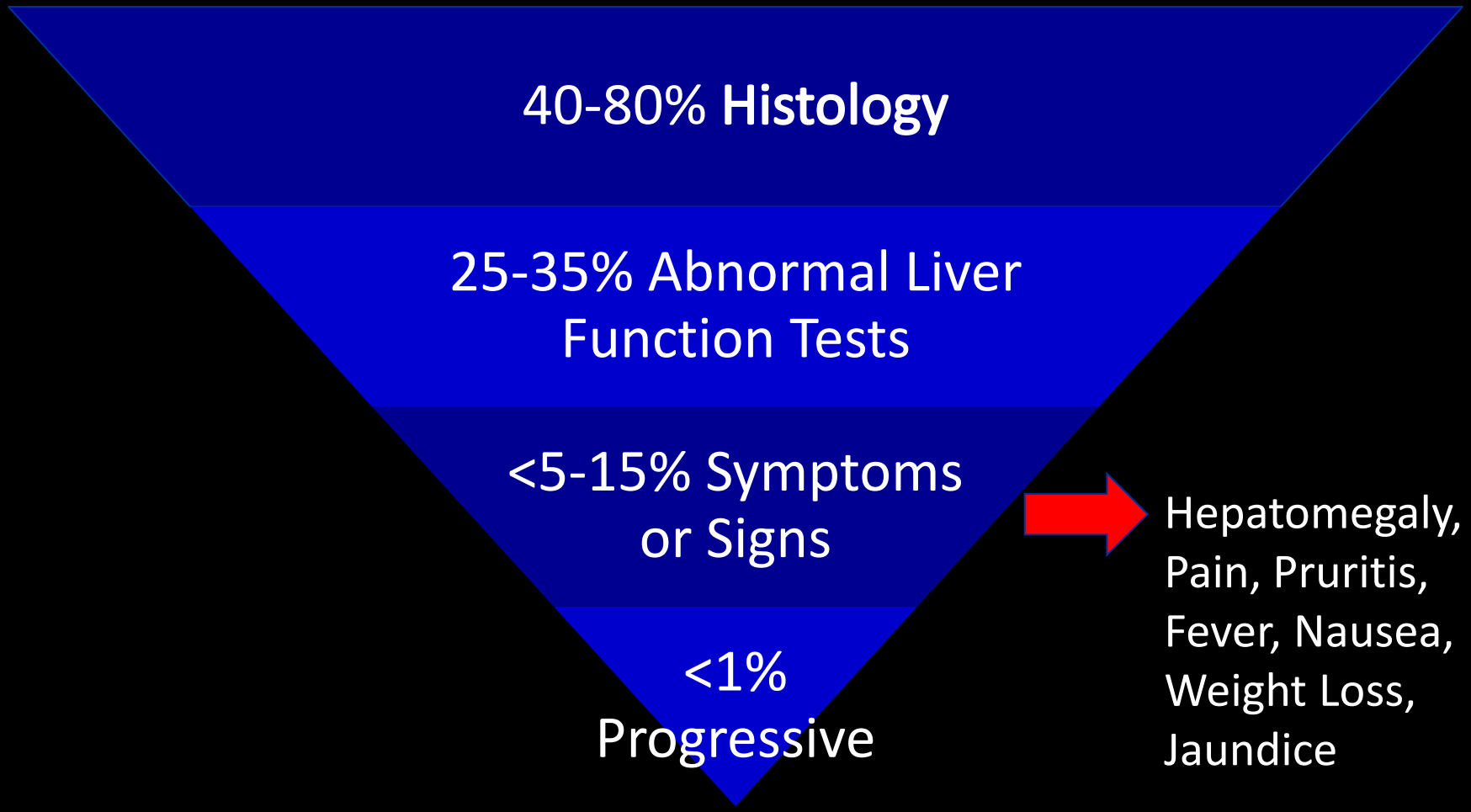
*[2] Genetic Component: Having a first sib with hepatic sarcoid increases the likelihood of liver involvement by three times in the second sib. (SAGA study).

Gastrointestinal Tract (<1%)

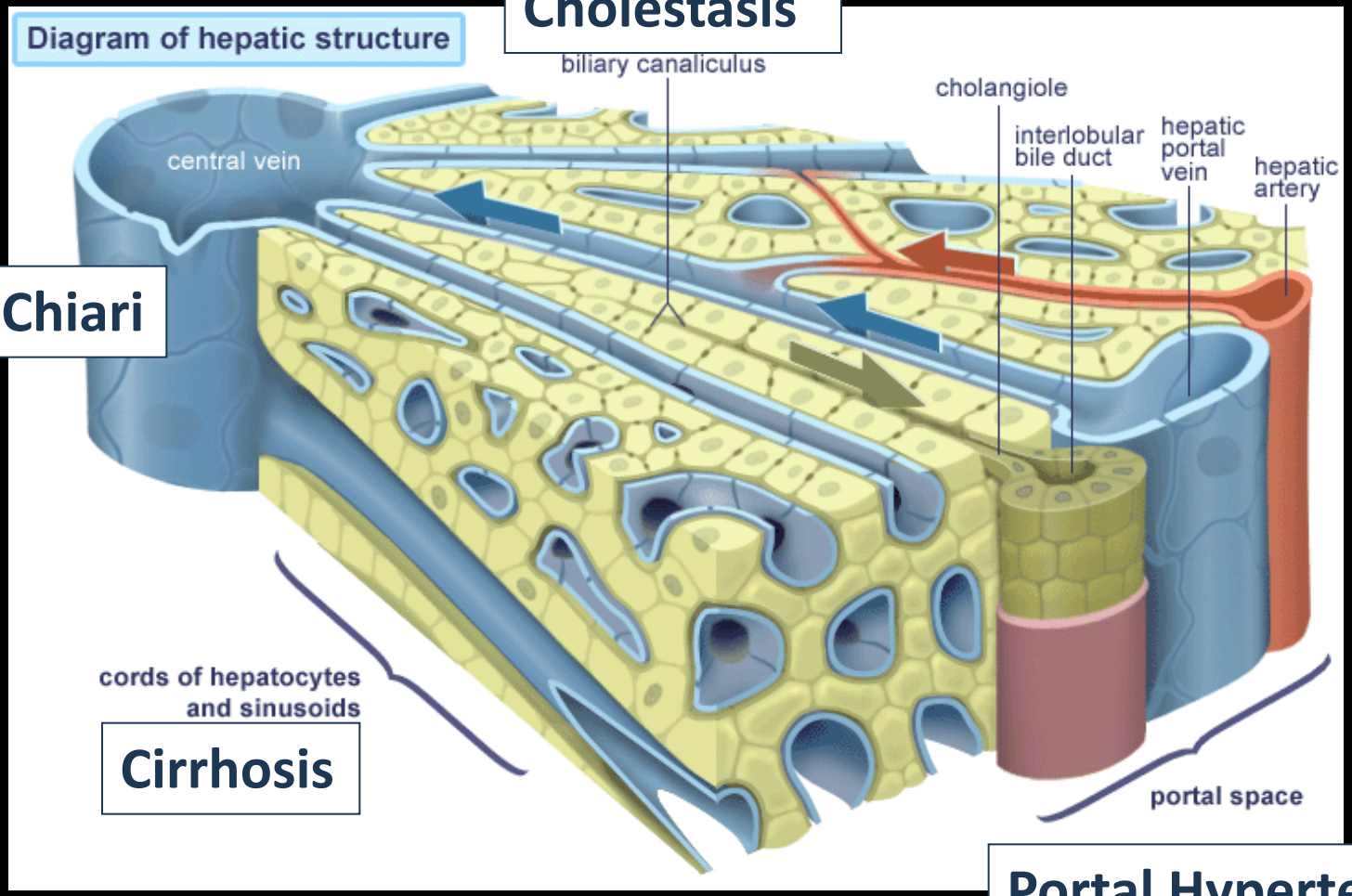
1. Baughman RP, et al. "Clinical Characteristics of Patients in a Case Control Study of Sarcoidosis". *AJRCCM*, 2001.

2. The Sarcoidosis Genetic Analysis Study: Judson MA, et al. Comparison of Sarcoidosis Phenotypes Among Affected African-American Siblings". *Chest* 2006.

Hepatic Sarcoidosis



Hepatic Sarcoidosis



Cholestasis

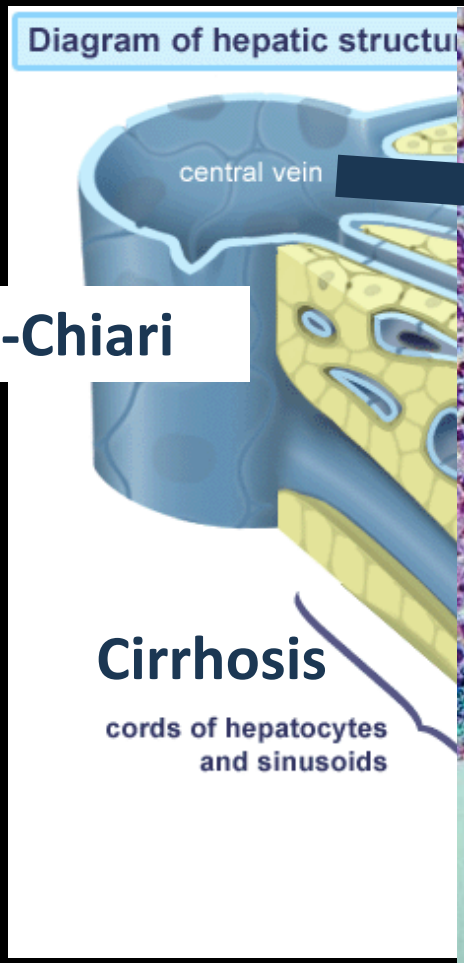
Budd-Chiari

Cirrhosis

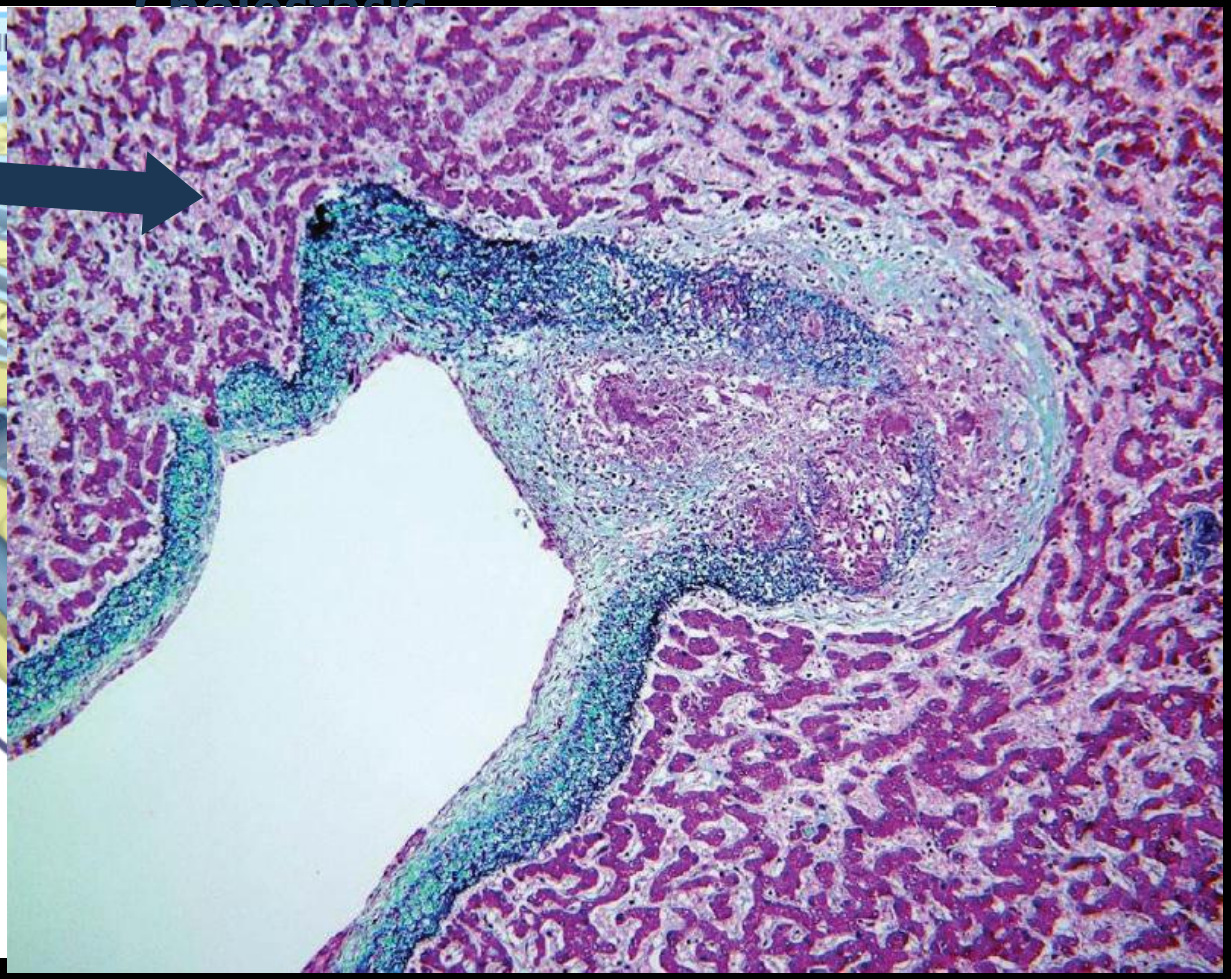
Portal Hypertension

Gartner and Hiatt, 2nd Edition, Chapter 18, Digestive System III: Glands, pp. 416-434.

Liver Structure



Budd-Chiari



*Noncaseating granulomas in a hepatic vein. GI pathology. Elsevier 2009.

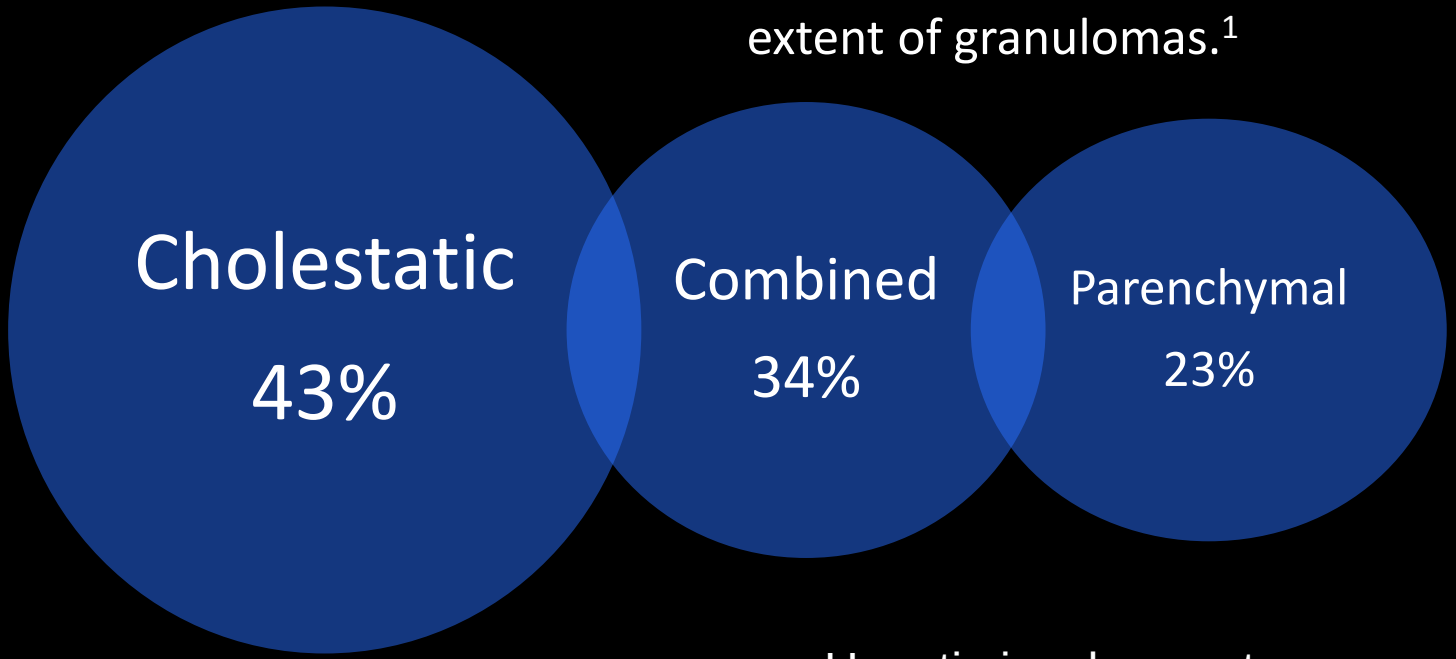
Histology
Granulomatous Inflammation

- Cholestatic Findings
  - Periductal fibrosis
  - Ductopenia (rare)
  - Acute Cholangitis
- Necroinflammatory:
  - Focal Necrosis, mononuclear infiltration
- Vascular changes
  - Sinusodal dilatation
  - Granulomatous venulitis
  - Nodular Regenerative Hyperplasia
- Fibrosis
  - Periportal, Bridging, Cirrhosis

Devaney K, et al. Hepatic Sarcoidosis: Clinicopathologic features in 100 Patients. *Am J Surg Path*, 1993.

Liver-test Abnormalities in Sarcoidosis[1]

Severity of liver function tests are associated with degree of fibrosis and extent of granulomas.[1]

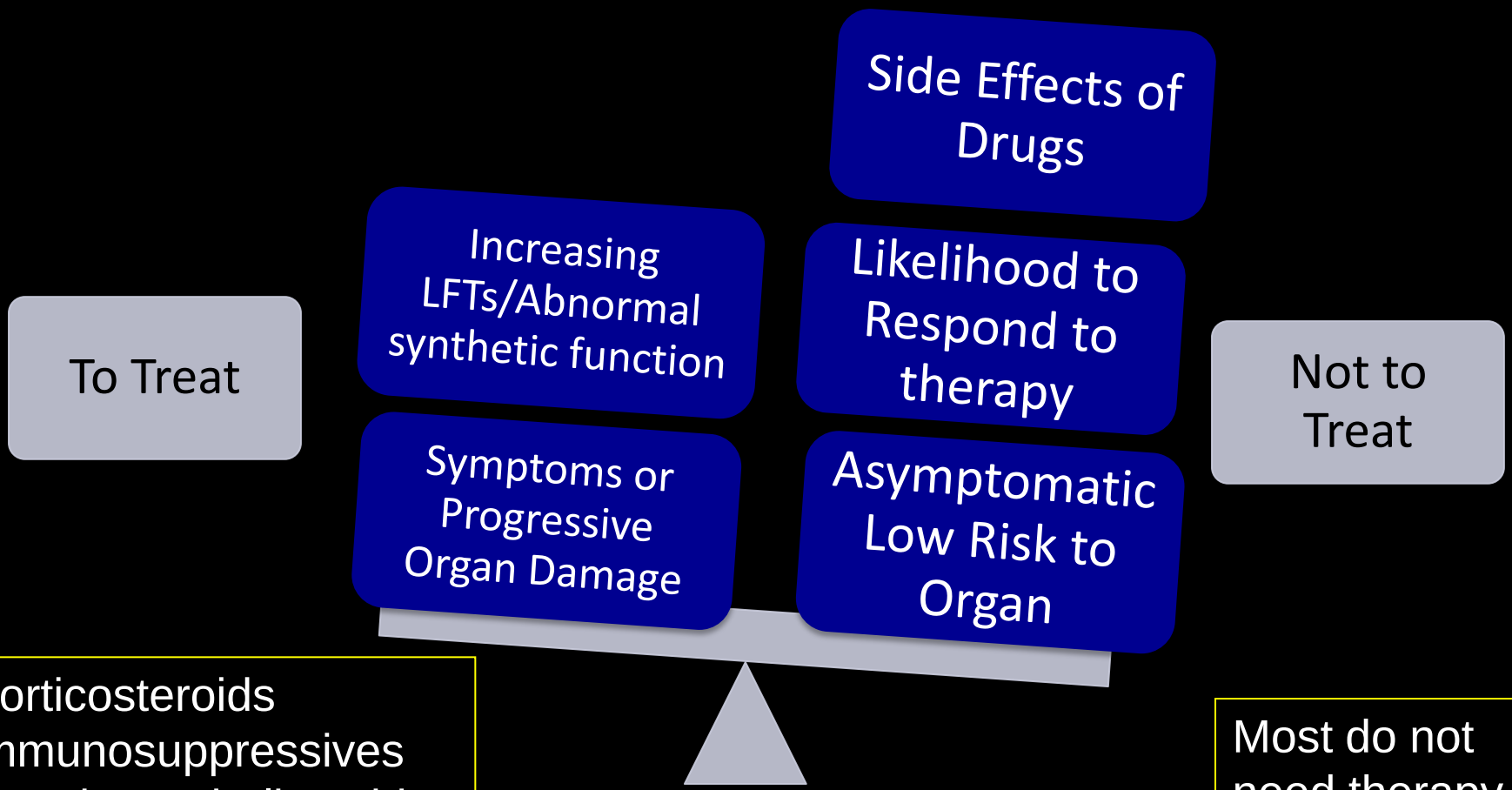


Hepatic involvement can occur with minimal or no pulmonary disease.[2]

1. Cremers J, et al. "Liver-test abnormalities in sarcoidosis". *European J of Gastroenterology and Hepatology,* 2012,24:17-24.

2. Kennedy PTF, et al. "Natural History of Hepatic Sarcoidosis and its Response to Treatment", *European J of Gastroenterology and Hepatology,* 2006, *18:721-26.*

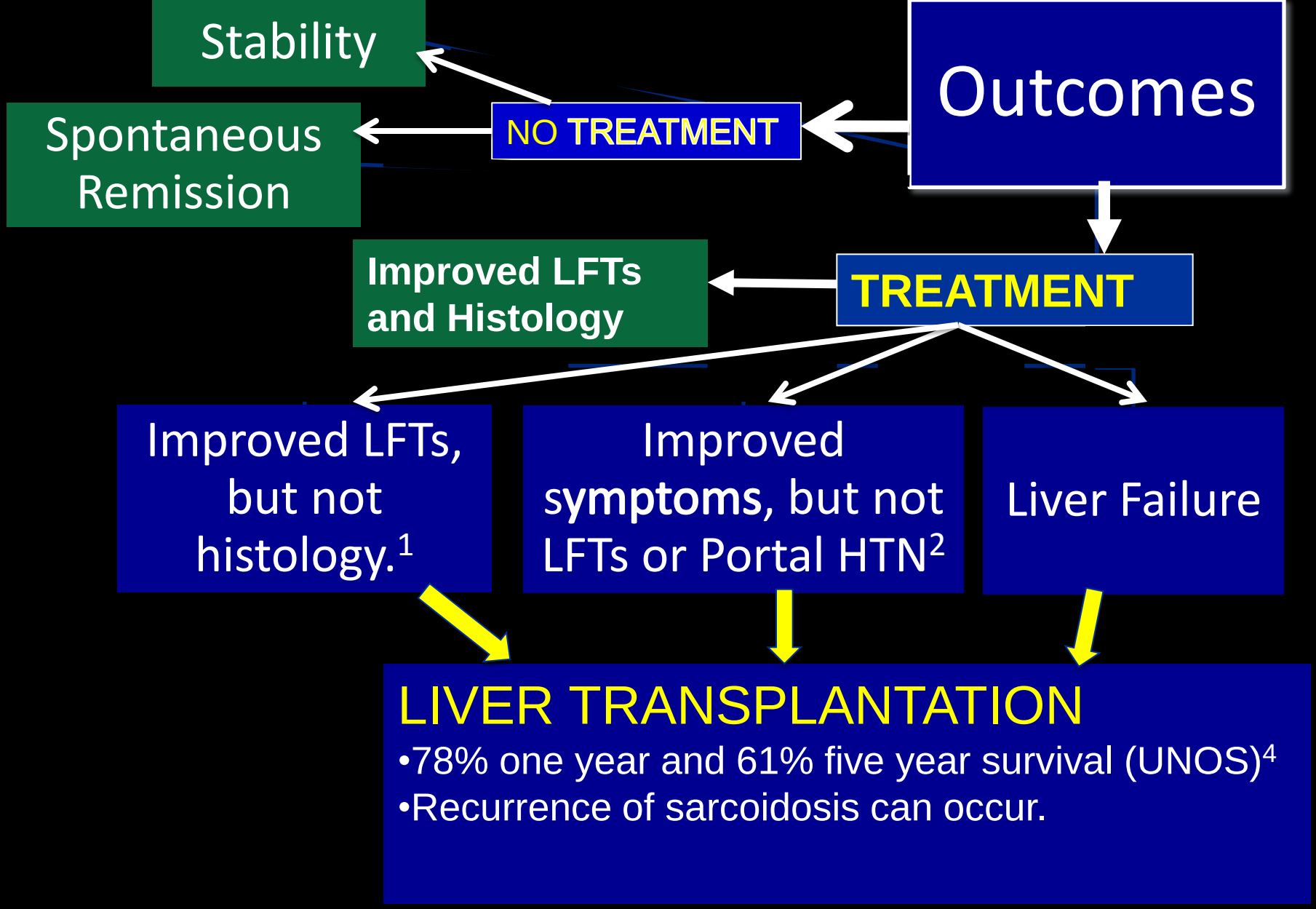
Treatment Decisions



Corticosteroids
Immunosuppressives
Ursodeoxycholic Acid

Liver Transplantation

Most do not need therapy.



1. Kennedy PTF, et al. “Natural History of Hepatic Sarcoidosis and its Response to Treatment”, *E J of GI and Hep,* 2006
2. Murphy JR, et al. “Small bile duct abnormalities in sarcoidosis”. *J Clin Gastroenterol,* 1990.
3. Vanatta JM. “Outcomes in Outcomes of orthotopic liver transplantation for hepatic sarcoidosis: an analysis of the UNOS/OPTN data files for a comparative study with cholestatic liver diseases”. *Liver Transpl*, 2011.

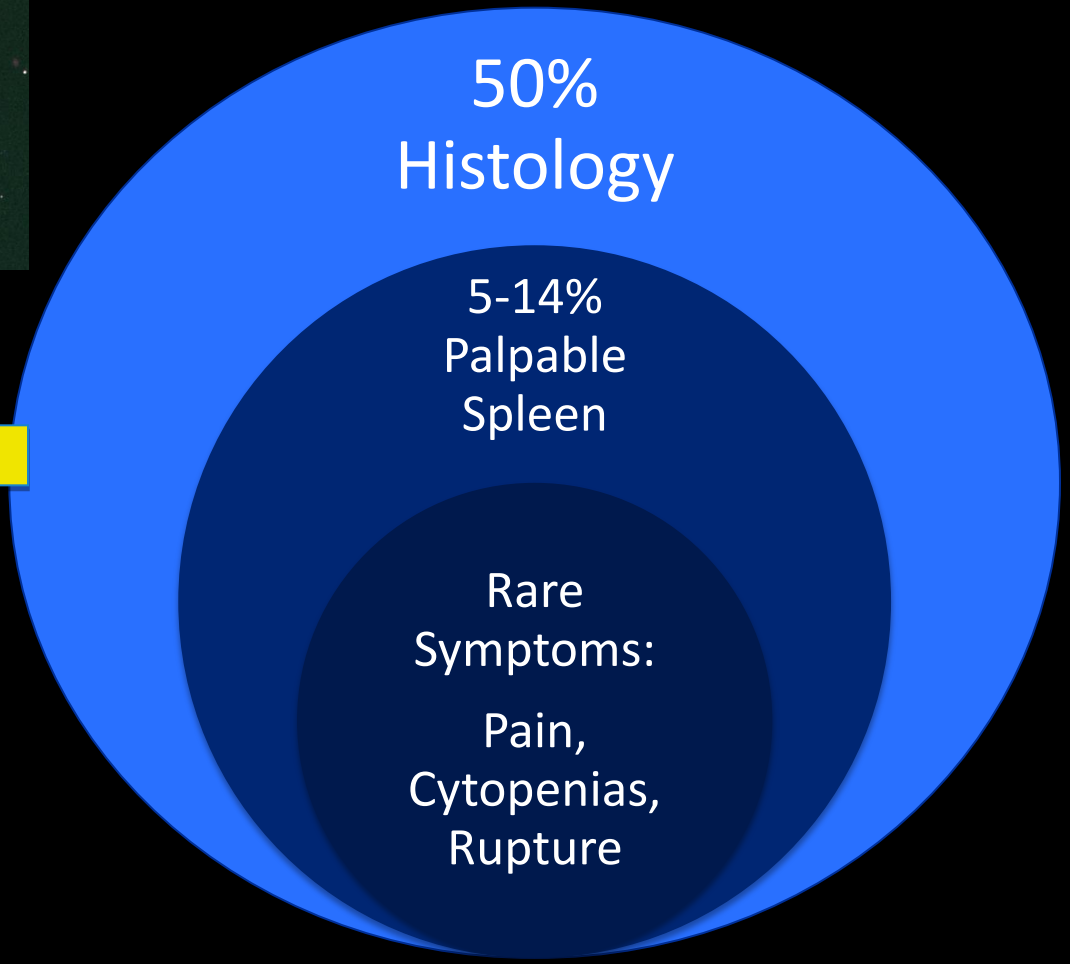
Challenges

- Timing of diagnostic liver biopsy
  - Consider with moderate/severe liver function abnormalities or loss of synthetic function.
- Monitoring
  - Frequency
    - Repeat liver function every 3-6 months
  - Consider liver biopsy in treatment response

Further research regarding diagnostic criteria and monitoring measures is needed.

Splenic Sarcoidosis

Associated with multi-organ involvement

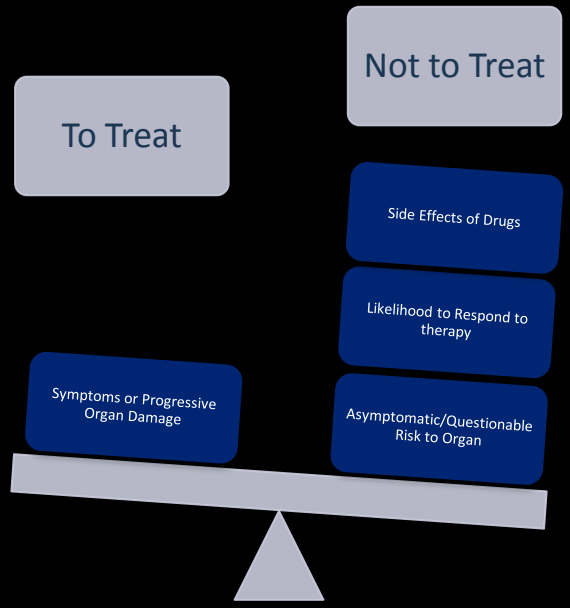


Treatment Indications

Spleen:

- Hypersplenism (refractory cytopenias)
- Functional Asplenism
- Potential Rupture
- Abdominal Pain

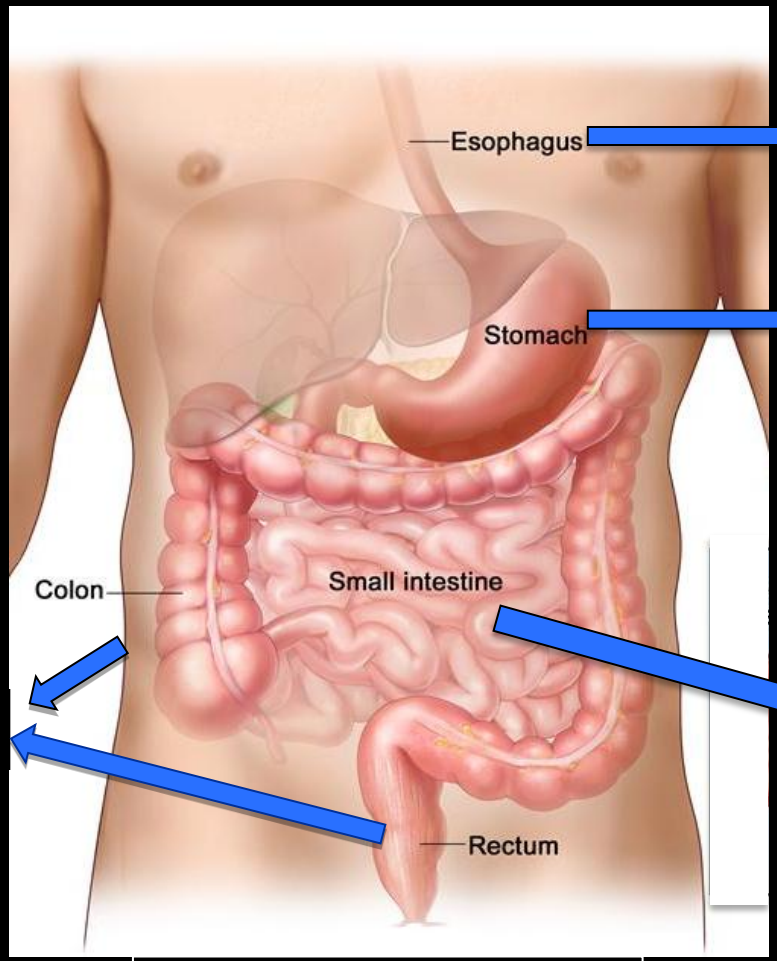
Corticosteroids
Immunosuppressives
Splenectomy



Gastrointestinal Sarcoidosis

Gastric is most common site of GI tract involvement.

1. Mechanical: Granulomatous Infiltration
2. Neuropathy/ myopathy
3. Mass obstruction
4. Extrinsic compression



Dysphagia

Pain, Nausea, Cramping, Anorexia, Hematemesis

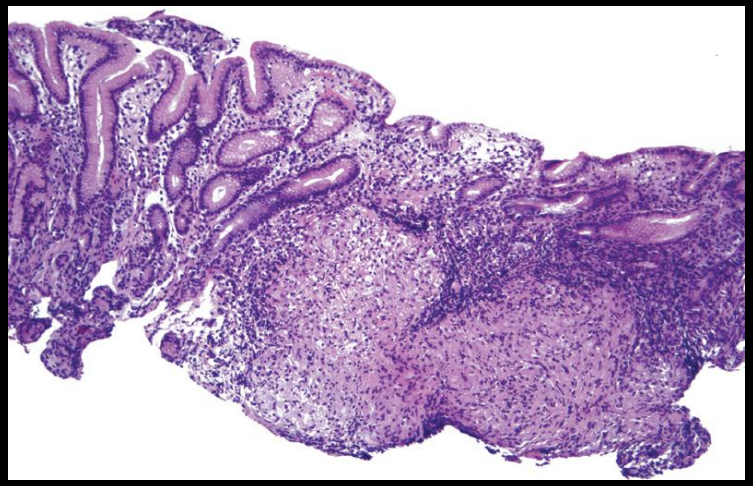
Diarrhea, Pain, Malabsorption, Bleeding

Mass, Colitis

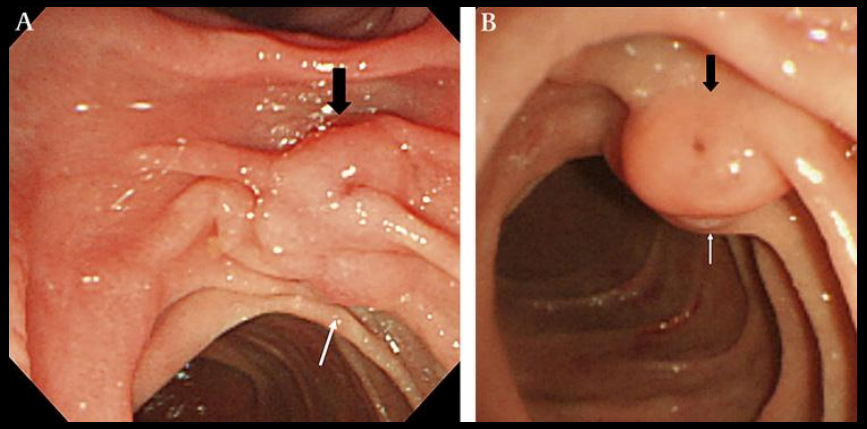
**Tissue is the issue!

Differential Diagnosis

- Crohn's Disease
- Malignancy**
- Gastritis
- Sarcoid-like reaction
- Foreign body reaction
- Infection (TB, Fungal)



Noncaseating granulomas in the antrum of the stomach. GI pathology. Elsevier 2012.

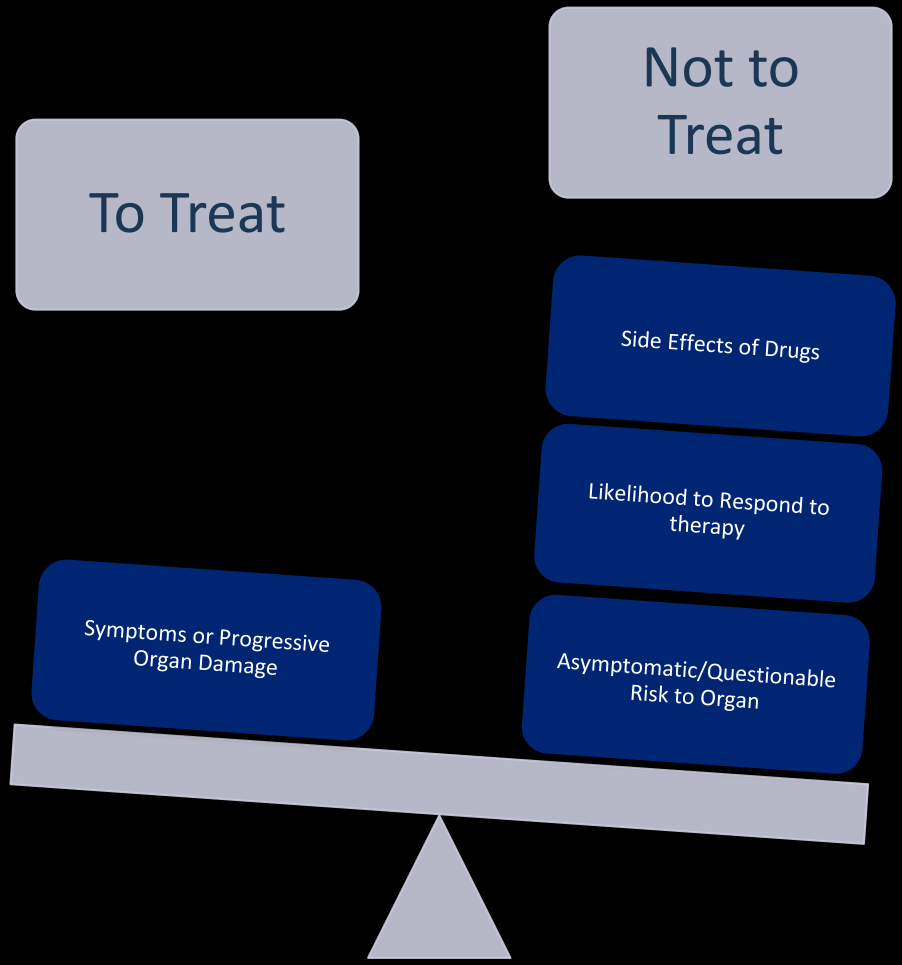


Tsujino T, et al. Duodenal mass in a patient with weight loss and liver dysfunction. *Gut* 2011;60:1659e1660

Treatment Indications

Gastrointestinal Tract

- Obstructing Mass
- Bleeding
- Dysphagia
- Pain



Thank you!