



Ultrasound assessment of the liver - normal liver anatomy, ultrasound semantics

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UCL International
Hepatology
ULTRASOUND COURSE

2026

26TH - 28TH FEBRUARY

LONDON

ROYAL FREE HOSPITAL

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Disclosure of Conflicts of Interest

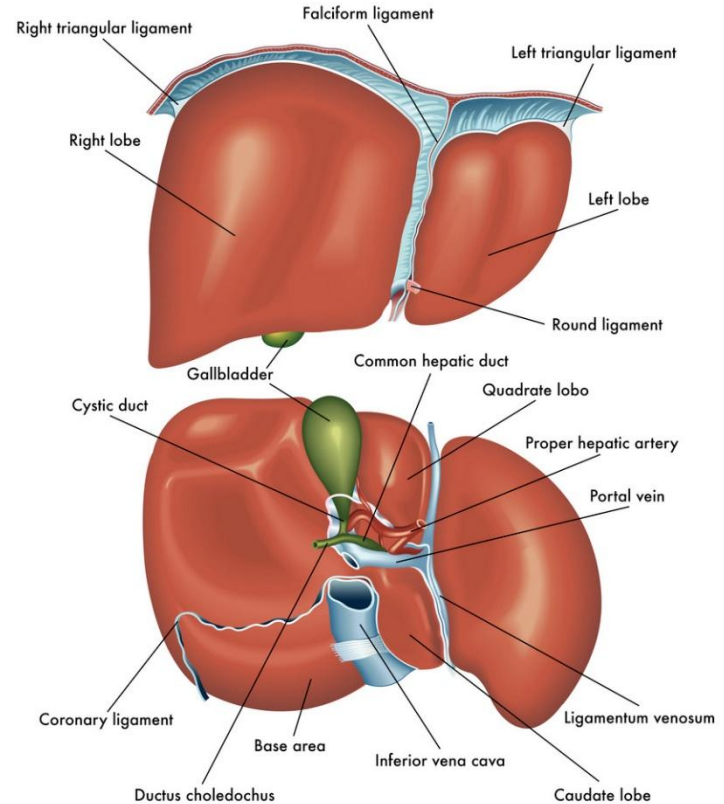
I herewith declare the following paid or unpaid consultancies, business interests or sources of honoraria payments for the past three years, and anything else which could potentially be viewed as a conflict of interest:

General Electric, Siemens, Mindray – speaker fee

General Electric, Siemens, Mindray, Samsung – research support (loan of equipment)

Liver anatomy

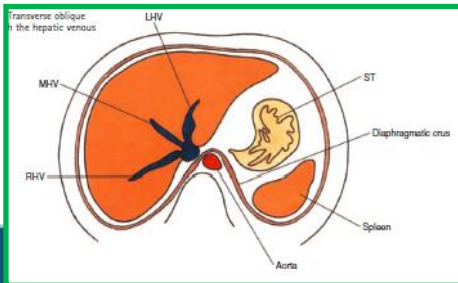
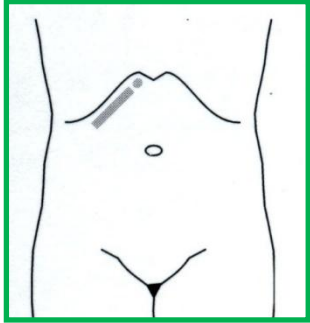
- Anatomical elements
- Vascular structures - portal vein and hepatic artery with their branches, suprahepatic veins
- Bile ducts
- Ligaments
- Relationships with surrounding organs (RK, right adrenal gland, gallbladder, pancreas, stomach, diaphragm)



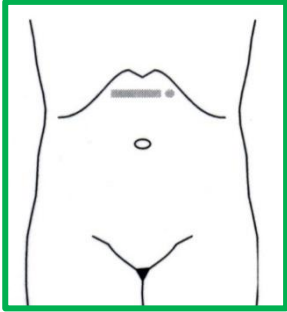
Examination technique

- Patient in fasting conditions
- Complete, systematic sweeping of the entire liver structure in at least 2 sections, transverse and longitudinal, is required
- Identification of vascular structures
- Characterization of liver structure - normally homogeneous
- The liver creates an ultrasound window to examine the organs in the right hypochondrium, e.g. gallbladder, right kidney.

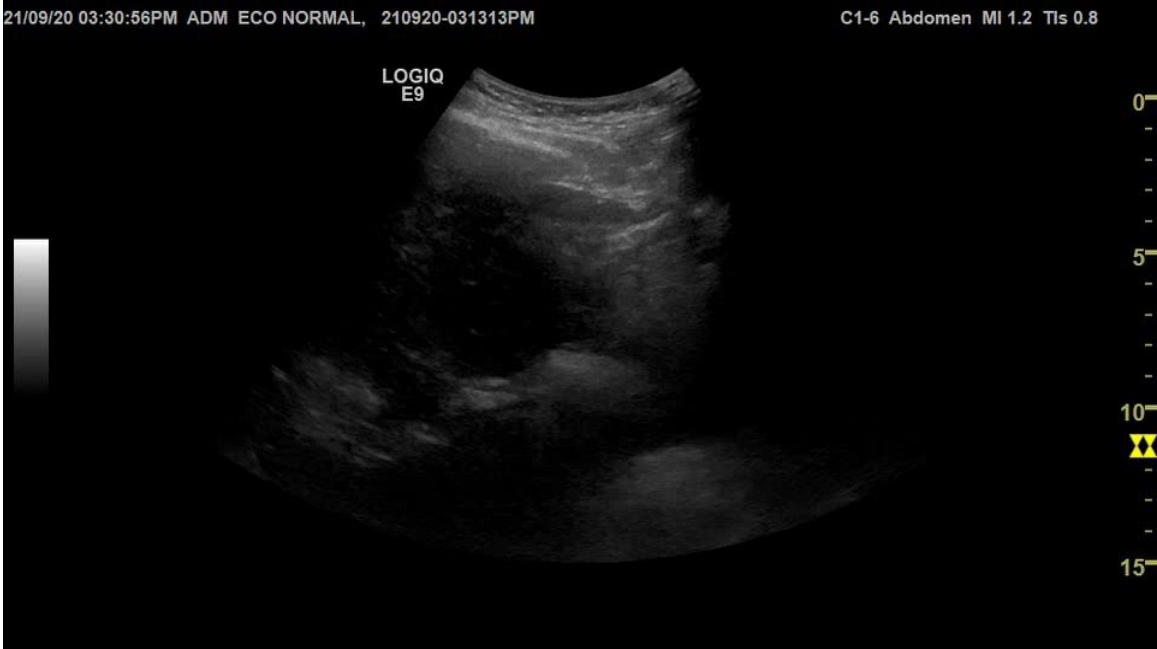
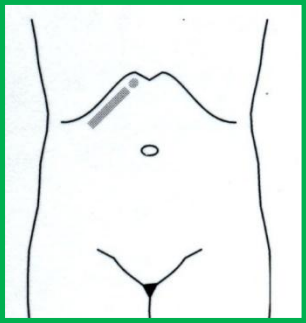
Subcostal right oblique section



Left liver lobe

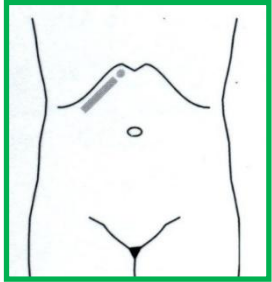


Right liver lobe

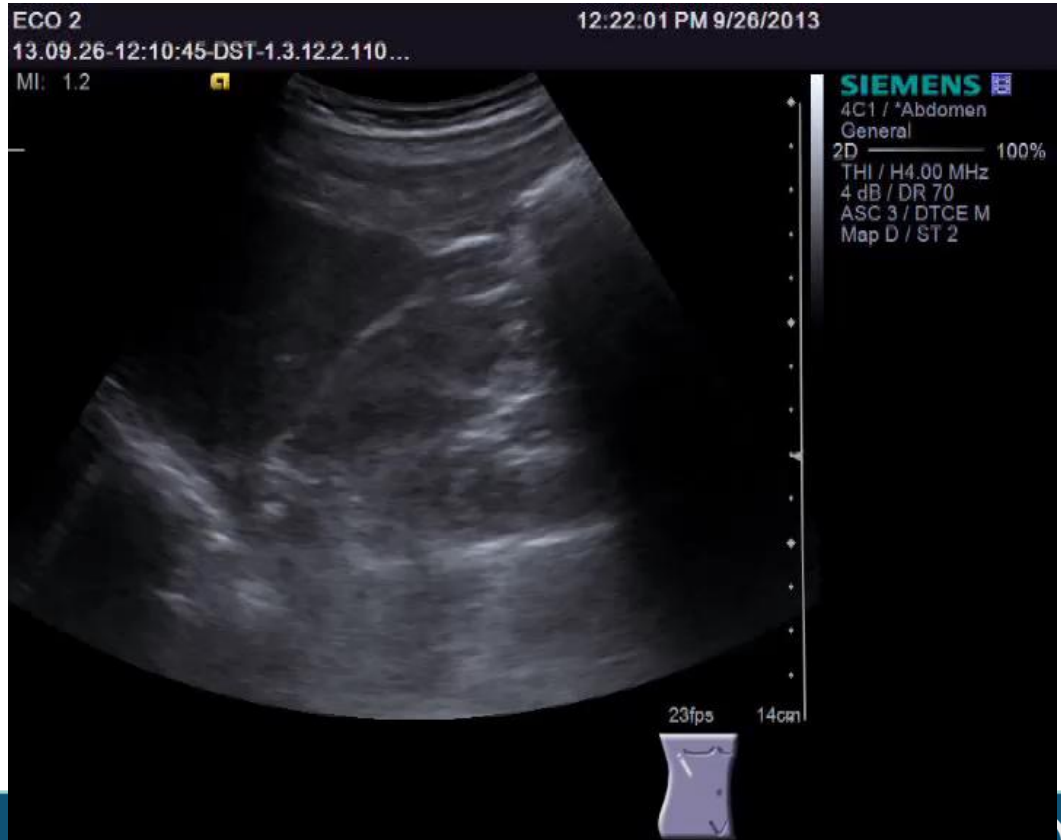
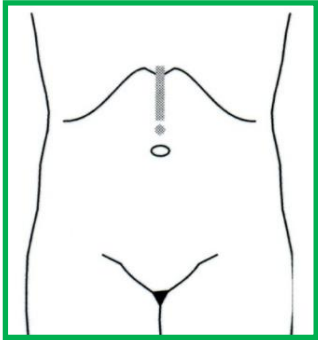


Subcostal right oblique section

- Hepatic veins
- Bifurcation of the portal vein

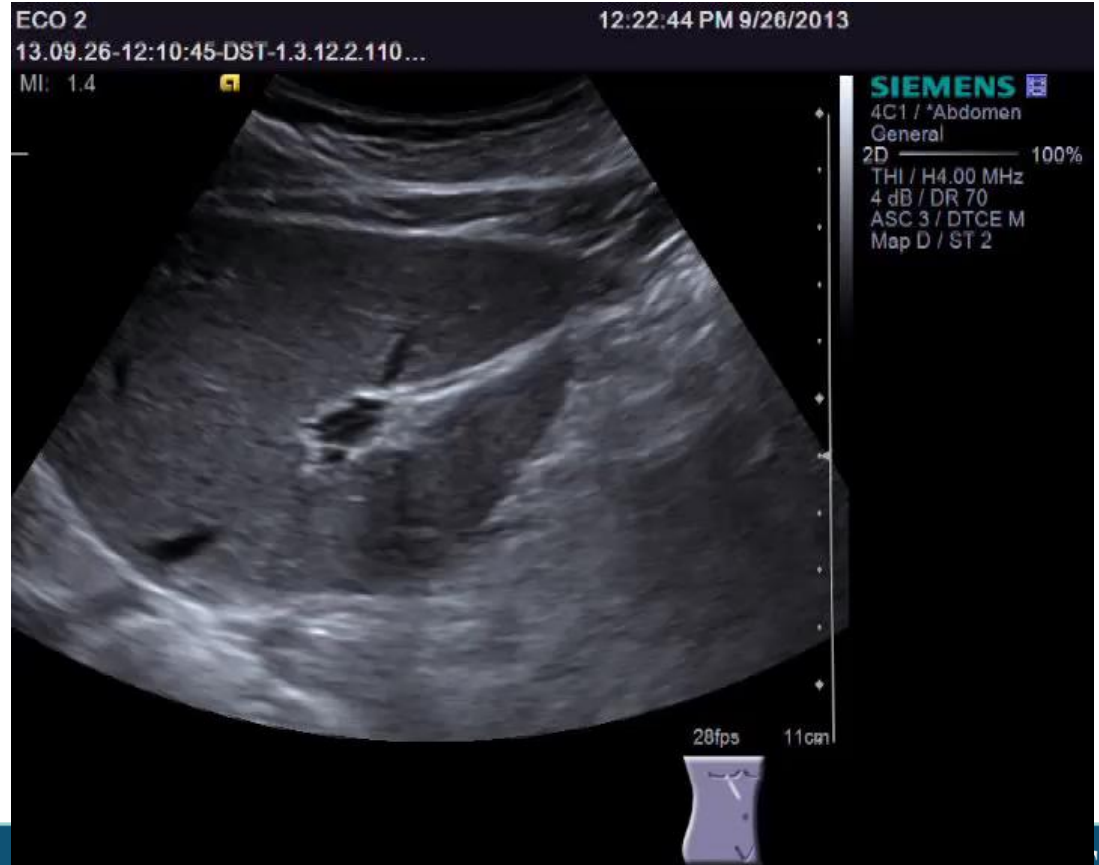


Longitudinal section

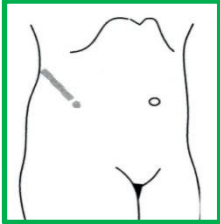


Hilum section

- Perpendicular to the costal rim



Intercostal sections



Liver surface

- High frequency probe



Examination criteria - SSOTM

- **Size** - No routine measurement of the liver size is recommended
- **Shape** - normal liver shape - pyramidal
- **Outline** normal liver surface - smooth
- **Texture** - normal liver texture - homogenous
- **Measurement** – caudate lobe

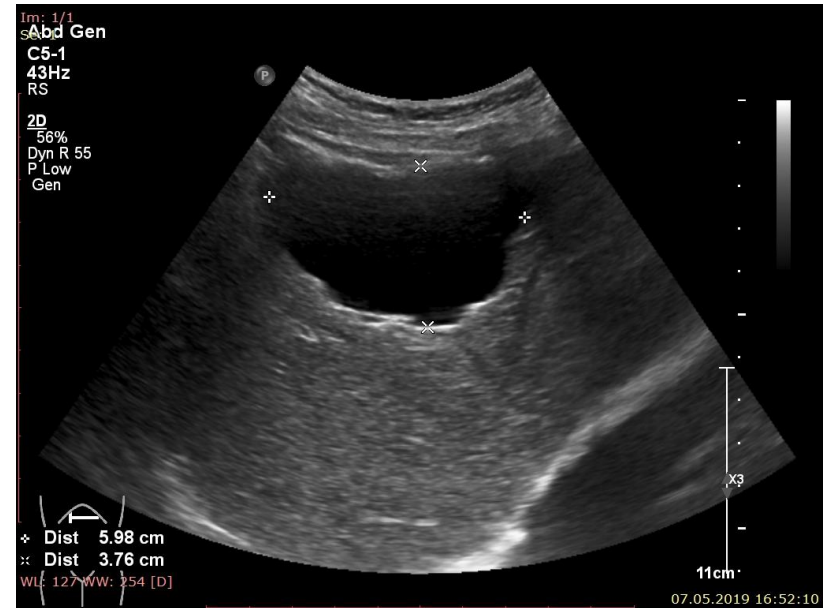


*Christoph F Dietrich, Byung I Choi - Examination of the Liver, in
WFUMB Course Book*

Hyperechoic



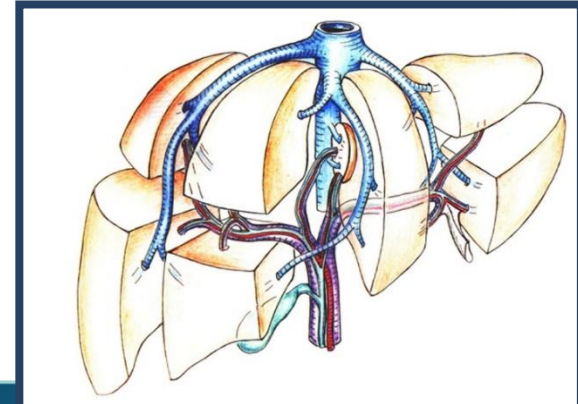
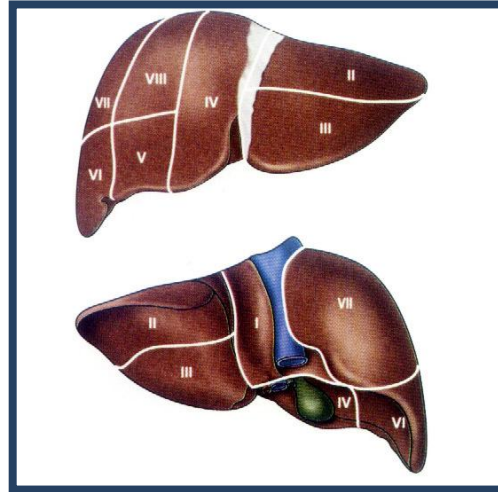
Transonic

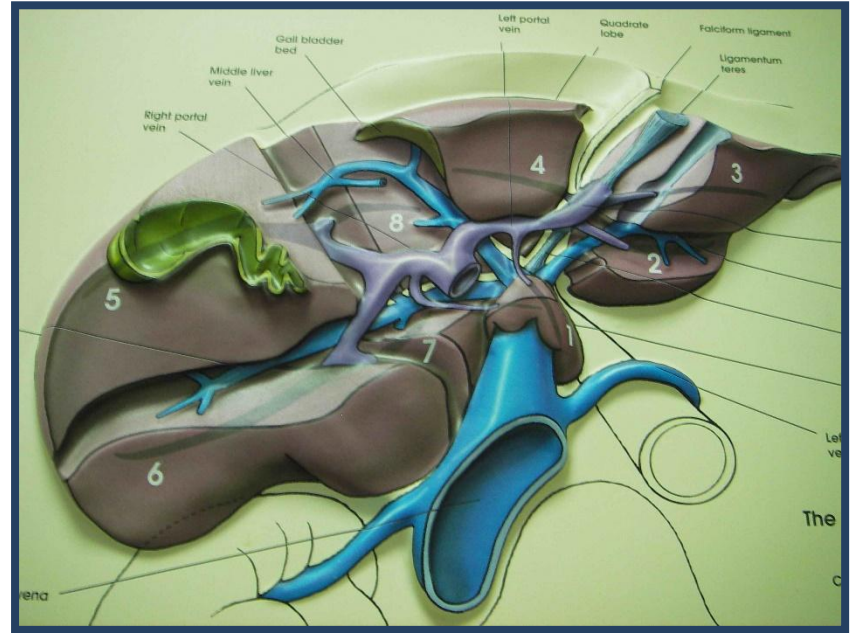
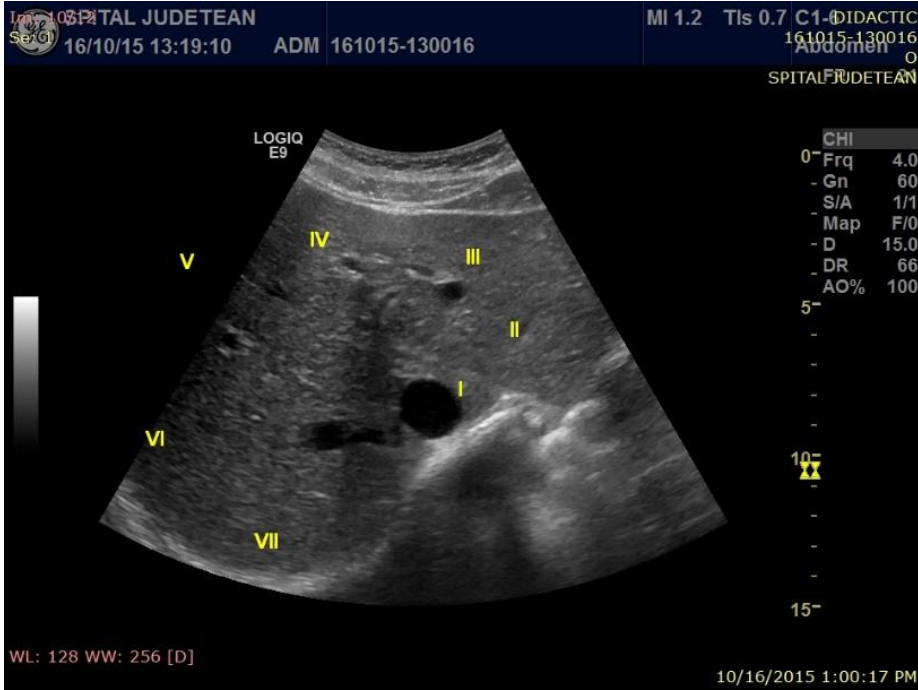


Liver segmentation (Couinaud – 1954)

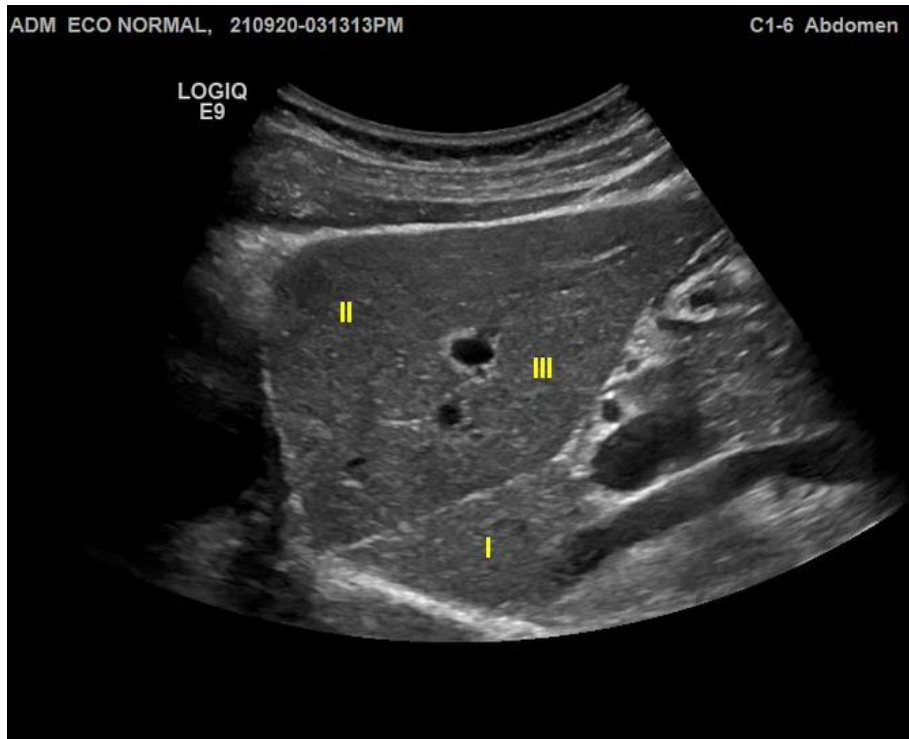
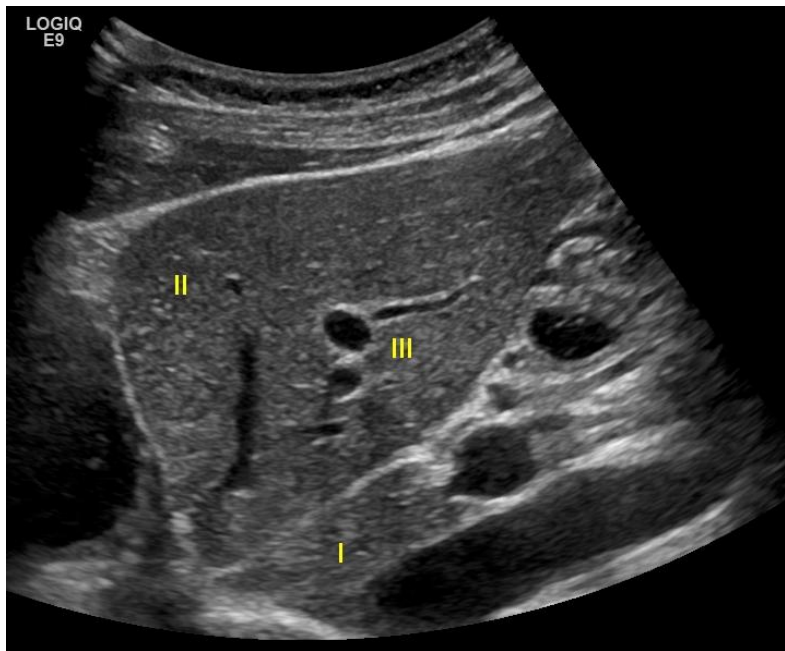
- Caudate lobe - segment I
- Left liver lobe. - segments I-IV
- Right liver lobe - segments V-VIII

- Each of these segments has its own vascular and biliary architecture. The segments are autonomous units, each unit can be resected without damaging the remaining segments.

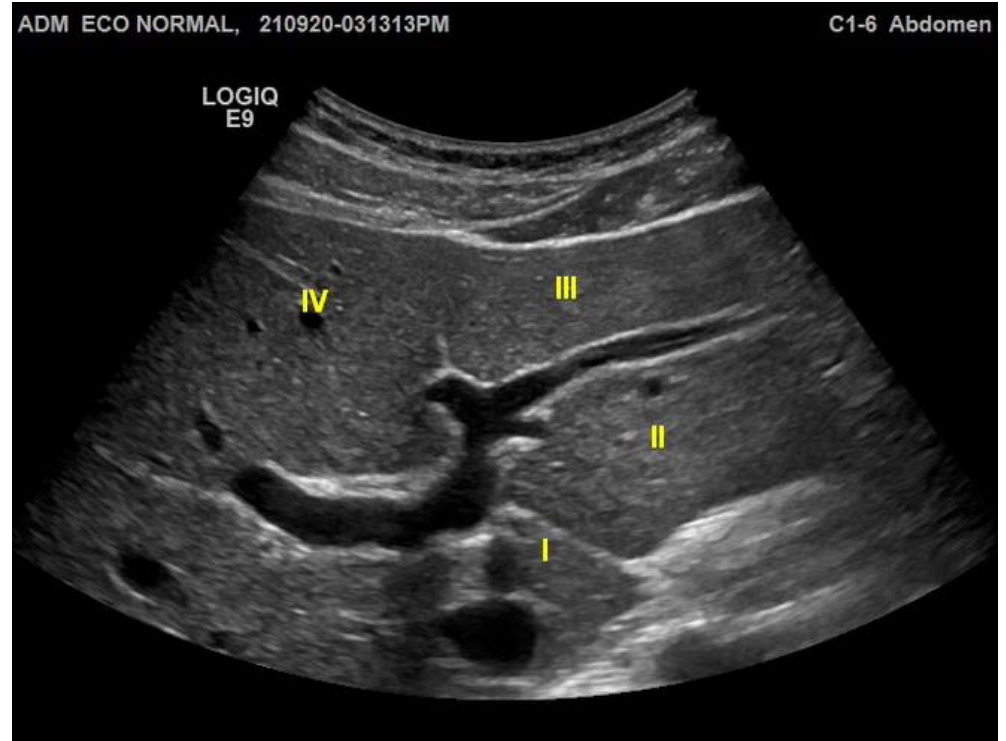
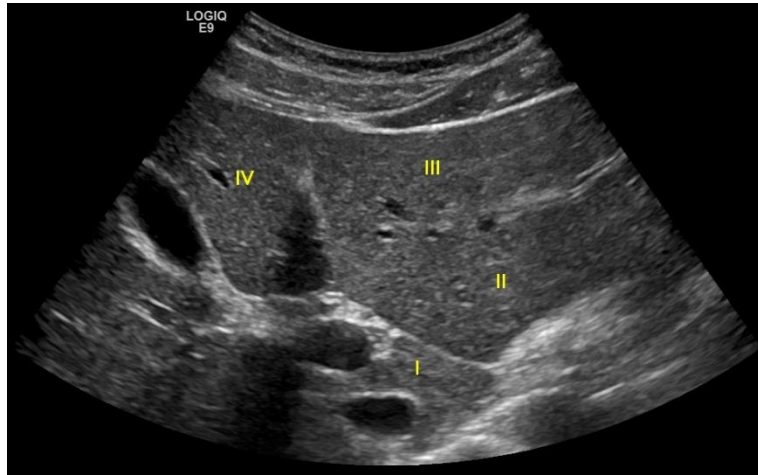




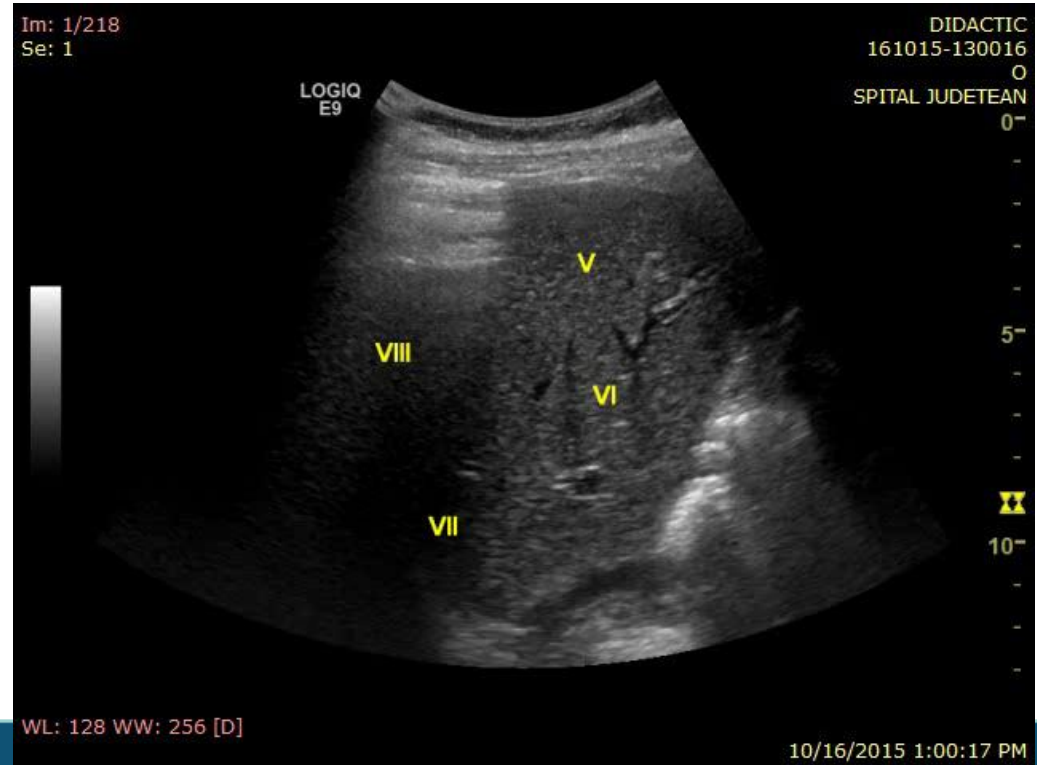
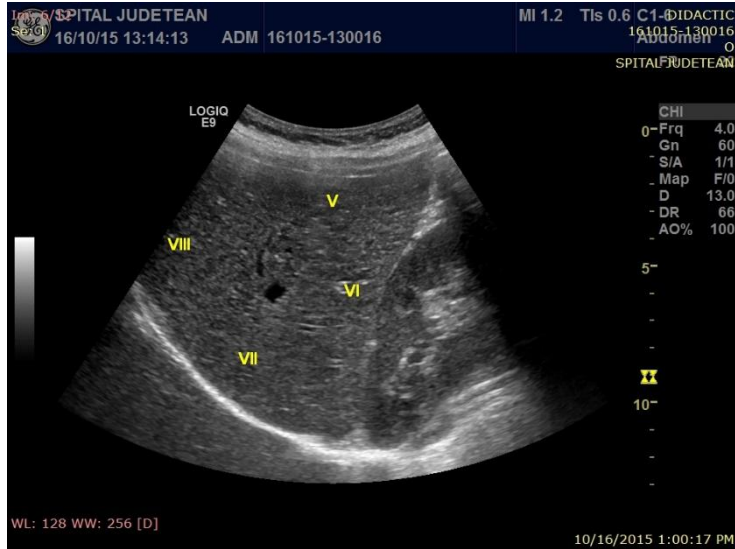
Longitudinal section LLL



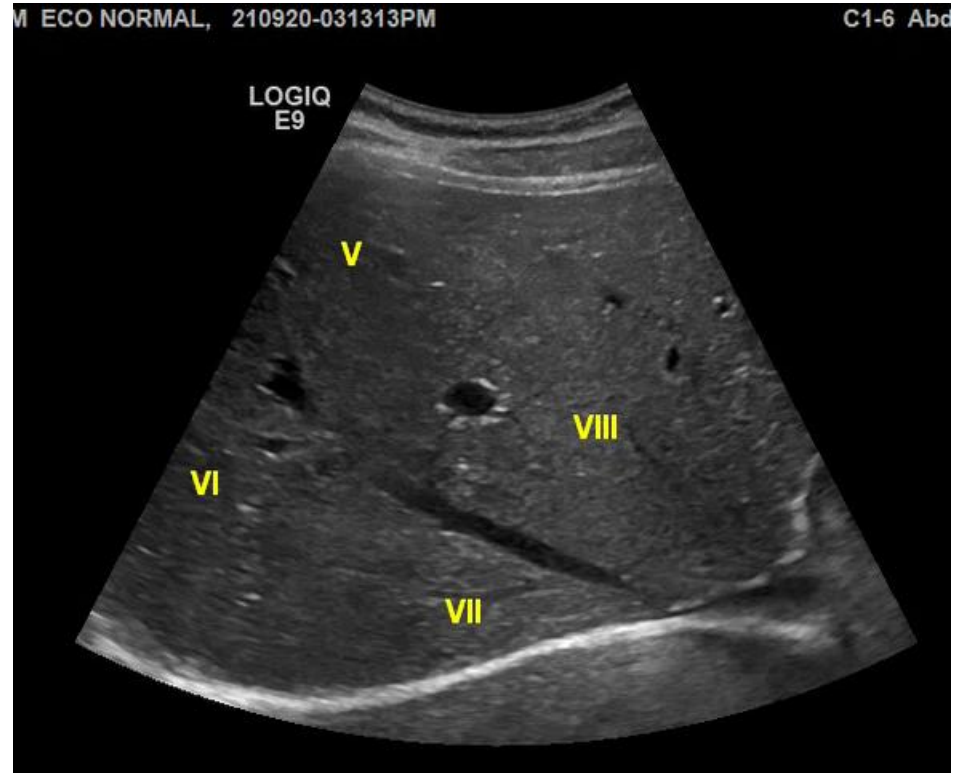
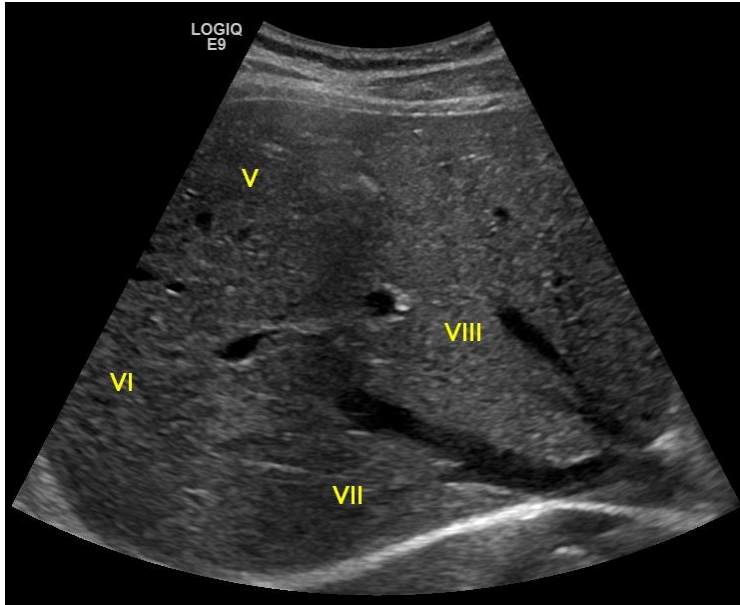
Transverse section LLL



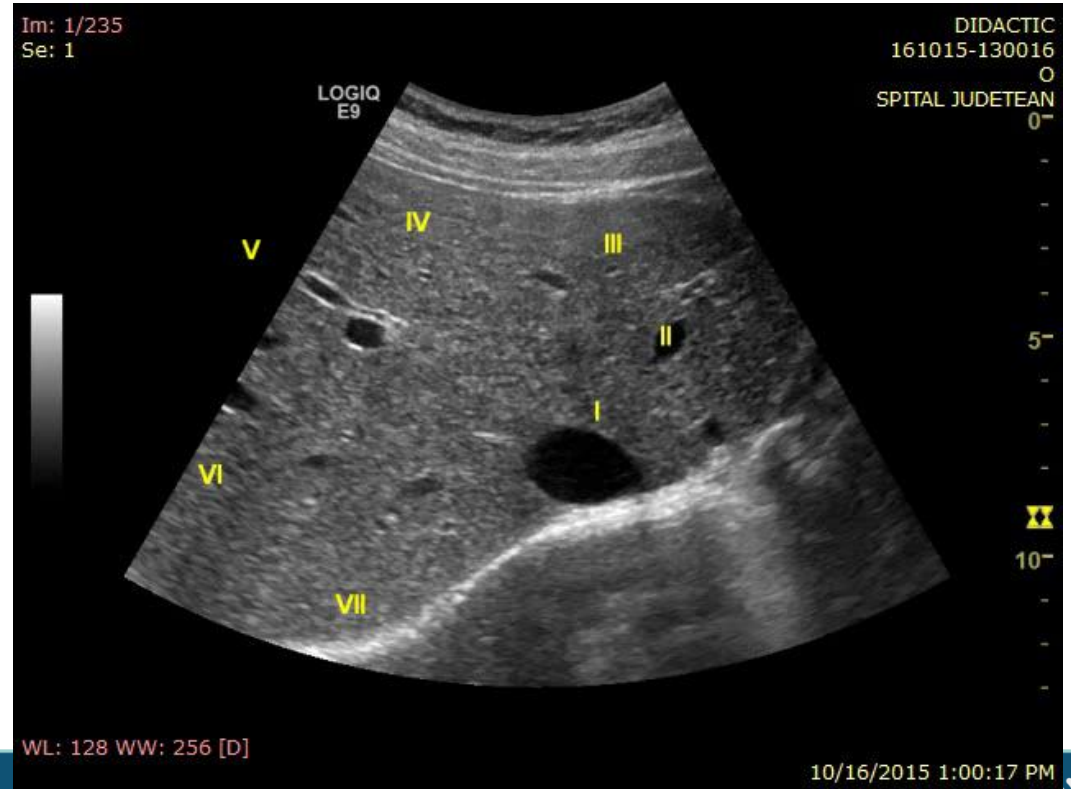
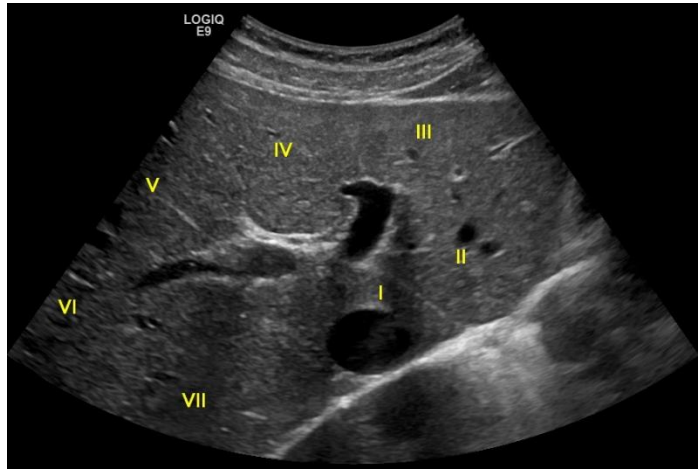
Longitudinal section RLL



Transverse section RLL



Subcostal right oblique section



Take home messages!

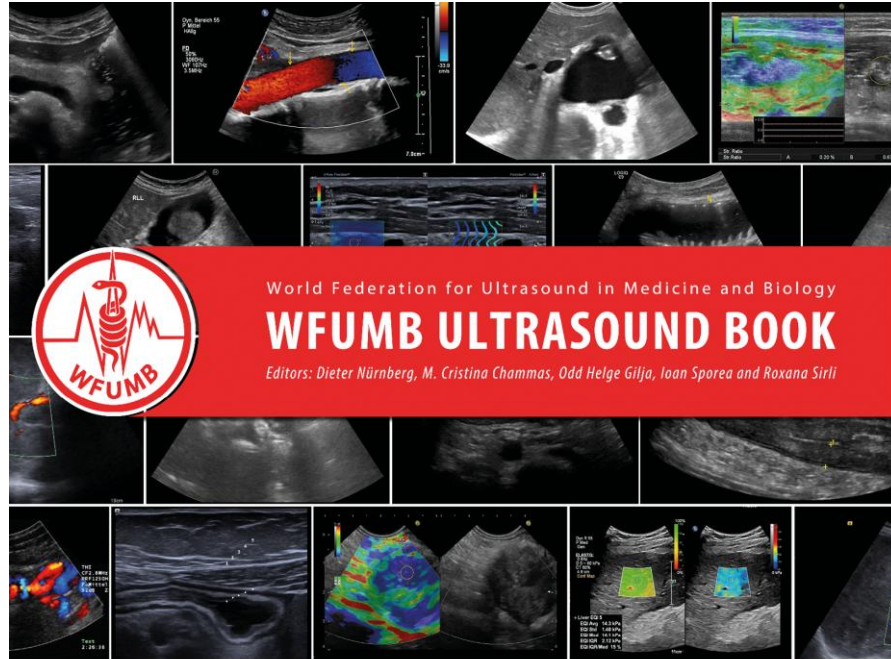
- The examination of the liver require a complete, systematic sweeping of the entire liver structure in at least 2 sections, transverse and longitudinal
- Identification of vascular structures – hepatic veins and the portal vein
- Identification of the hilum structures – portal vein, main biliary duct, hepatic artery
- Characterization of liver structure - normally homogeneous



I see with sound...



What's your superpower?



<http://wfumb.info/wfumb-ultrasound-book>