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UDFF AND AUTO pSWE ACCURATELY ASSESS LIVER STEATOSIS AND FIBROSIS RISK IN OBESE PATIENTS WITH MASLD – A PROSPECTIVE, HEAD-TO-HEAD, BIOPSY-CONTROLLED STUDY

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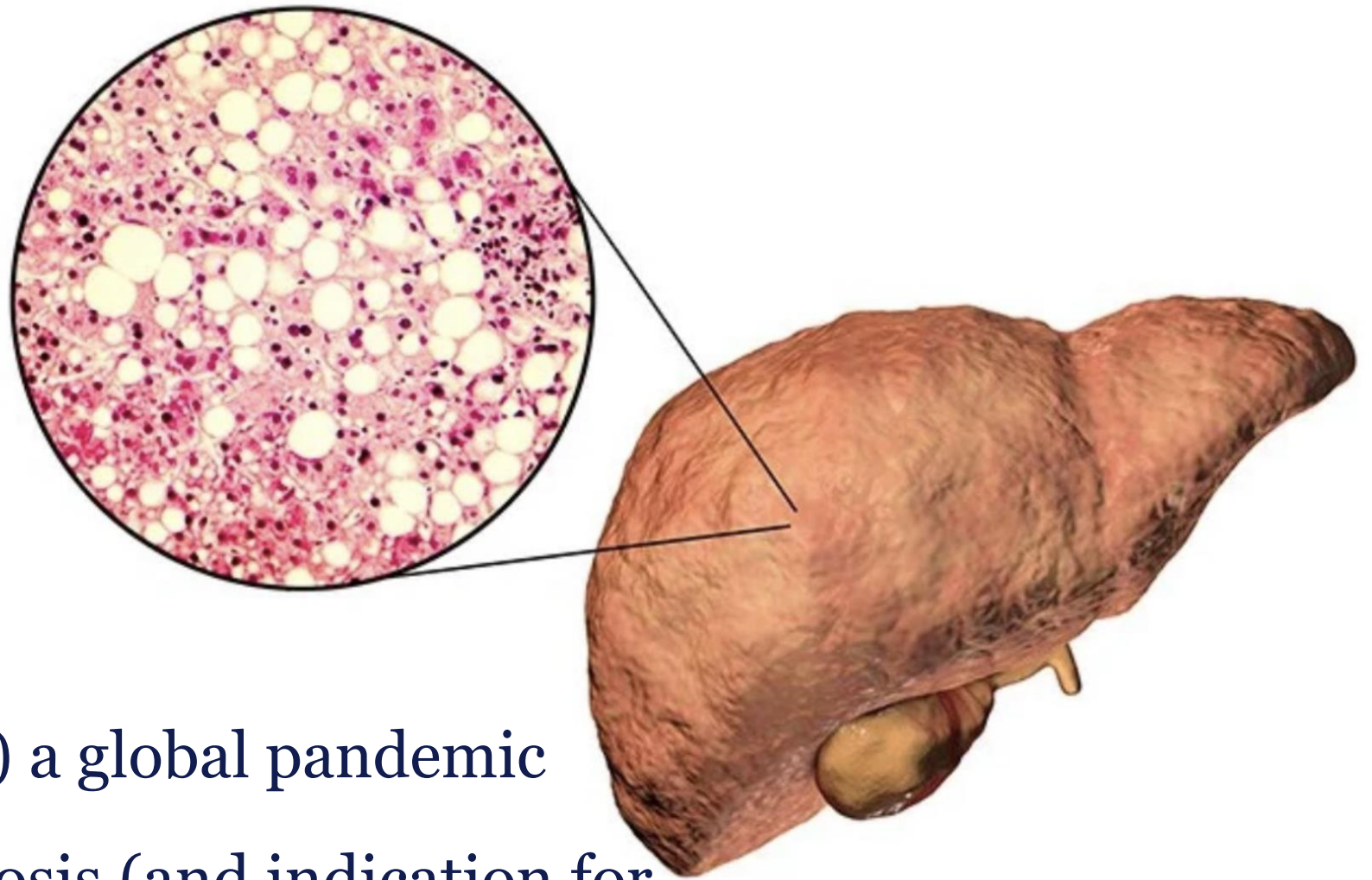
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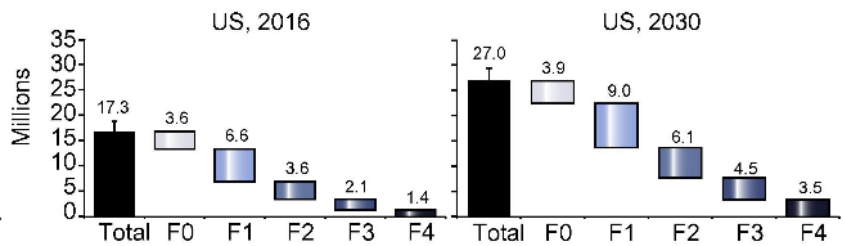
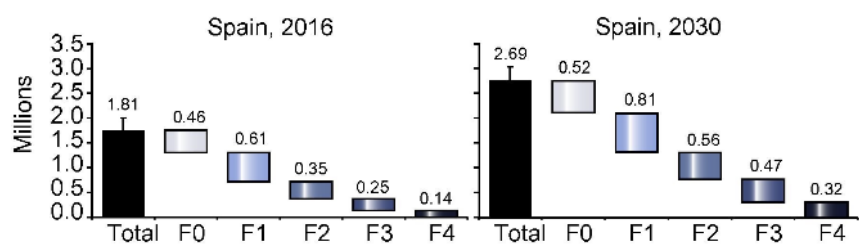
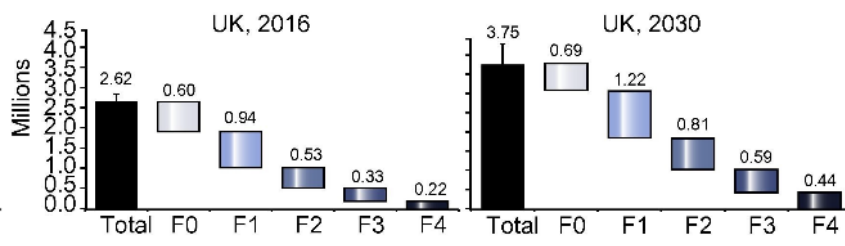
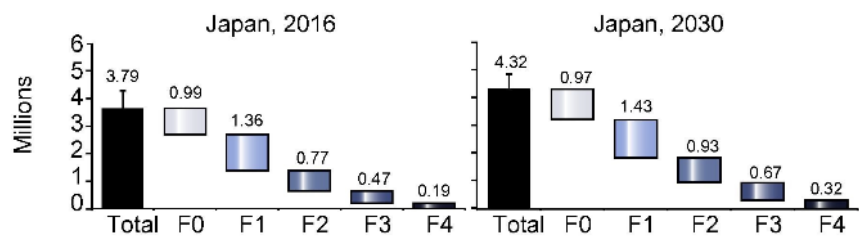
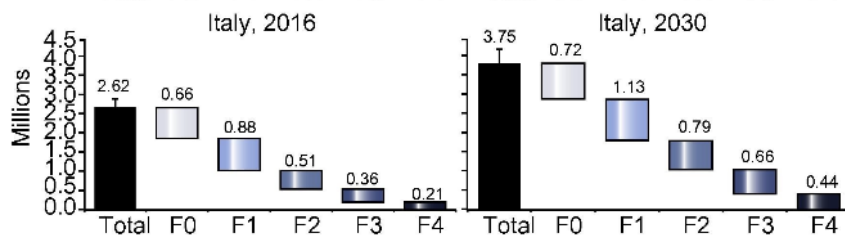
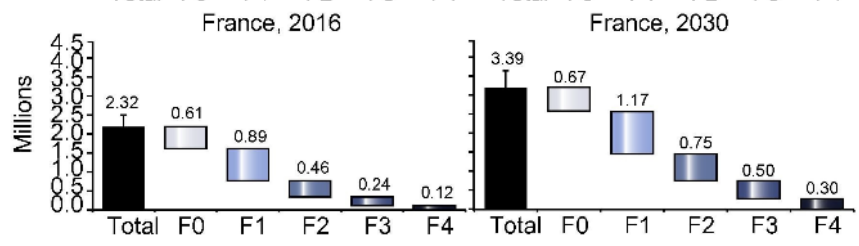
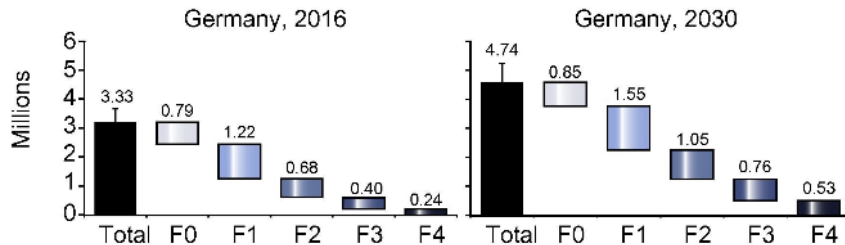
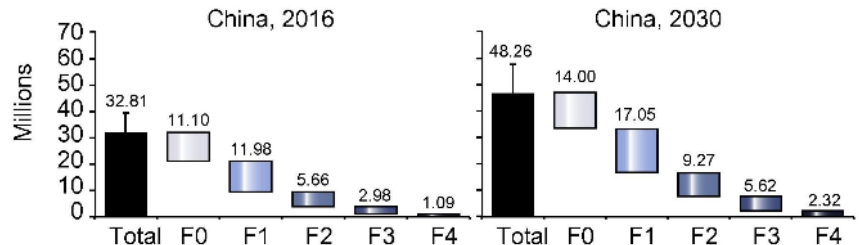
Combined Therapies, The Dawn of a New Era

No disclosures

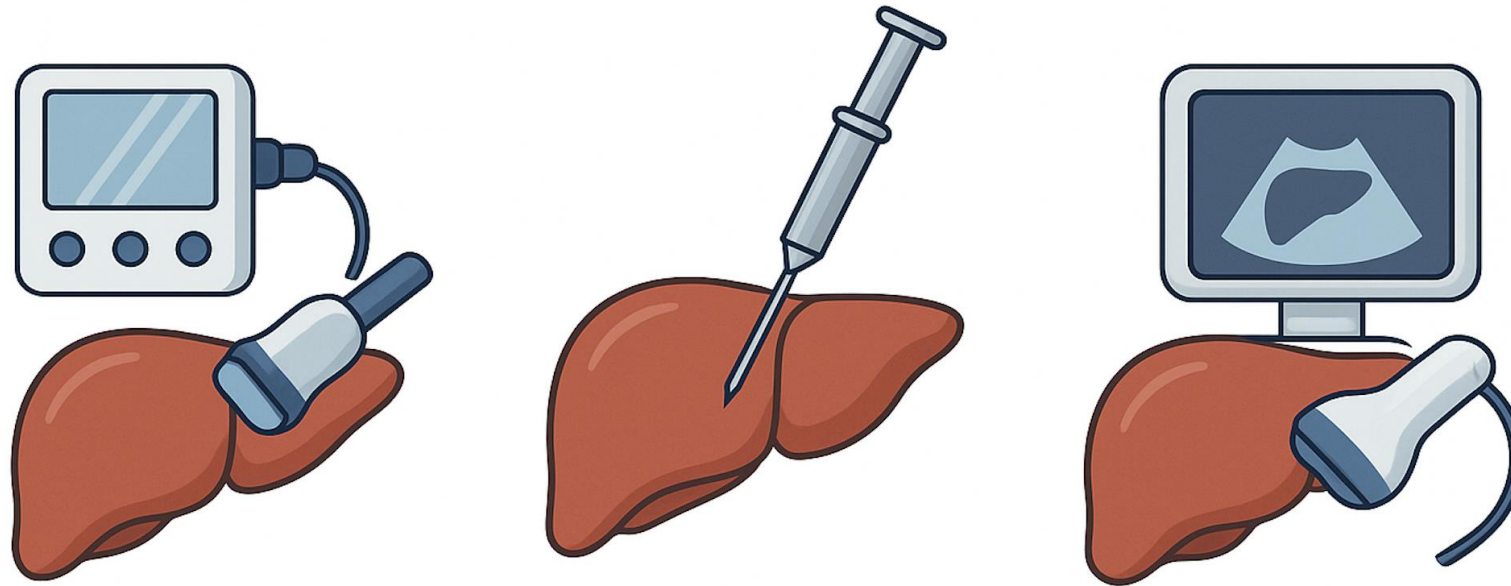
Why it is important to find new ways of assessing liver health in patients with obesity



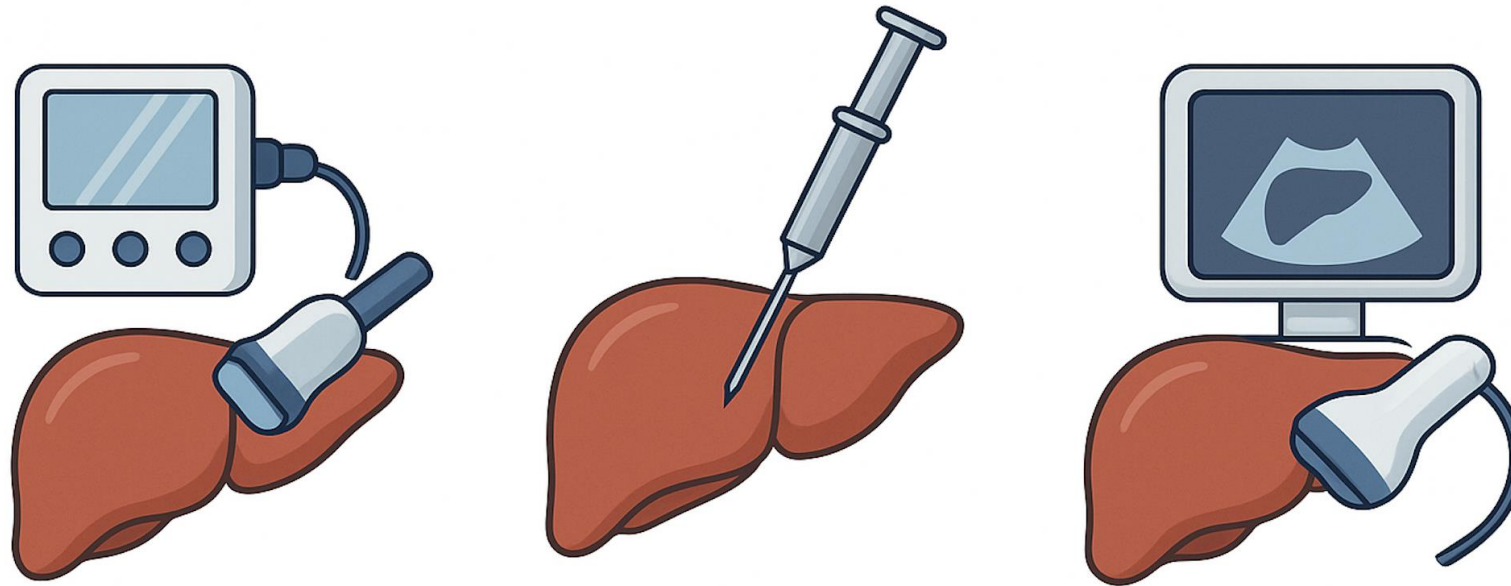
- MASLD is (becoming) a global pandemic
- #1 cause of liver cirrhosis (and indication for transplantation) in the US



Modeling NAFLD disease burden for the period 2016–2030

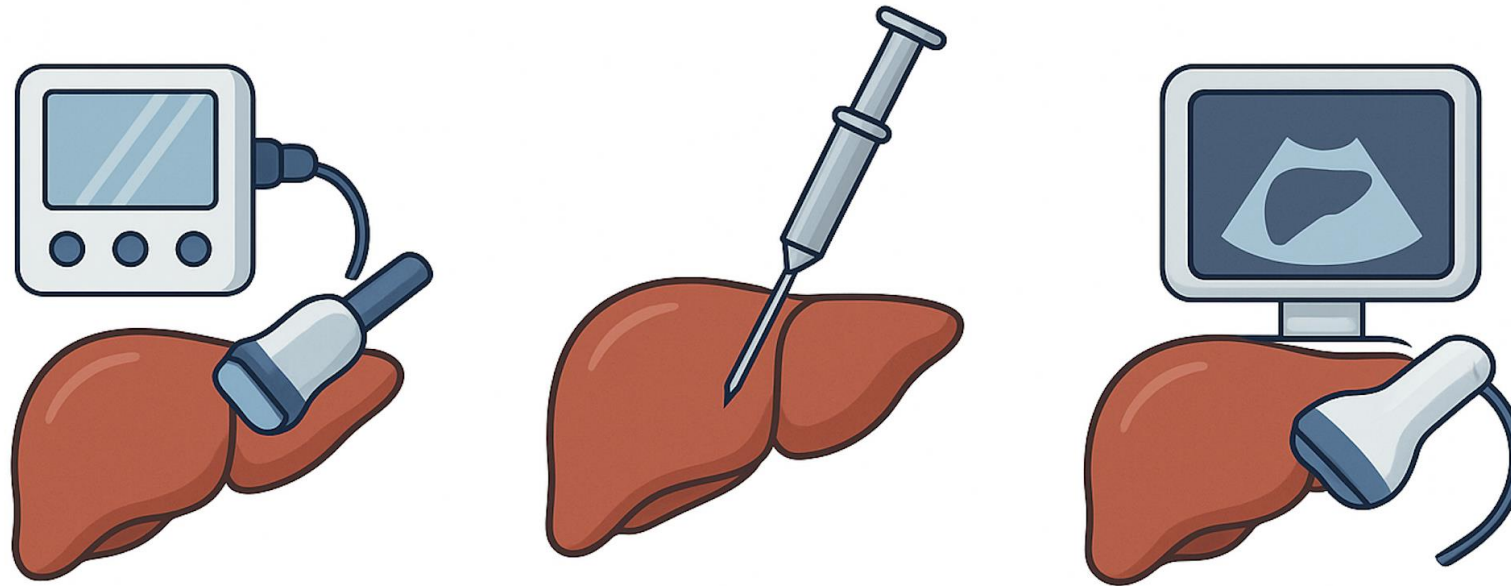


- Current ways: Liver biopsy, MRI, Fibrosis- Scores, Fibroscan (VCTE/CAP)



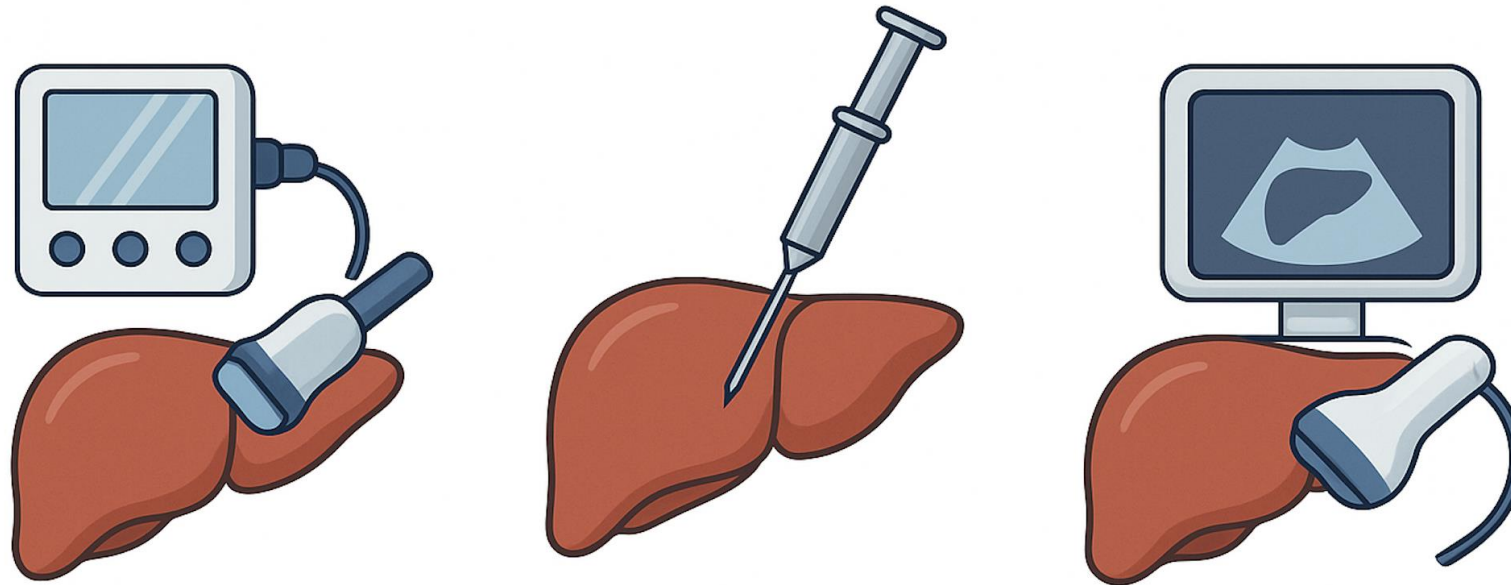
Invasive

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Invasive
expensive

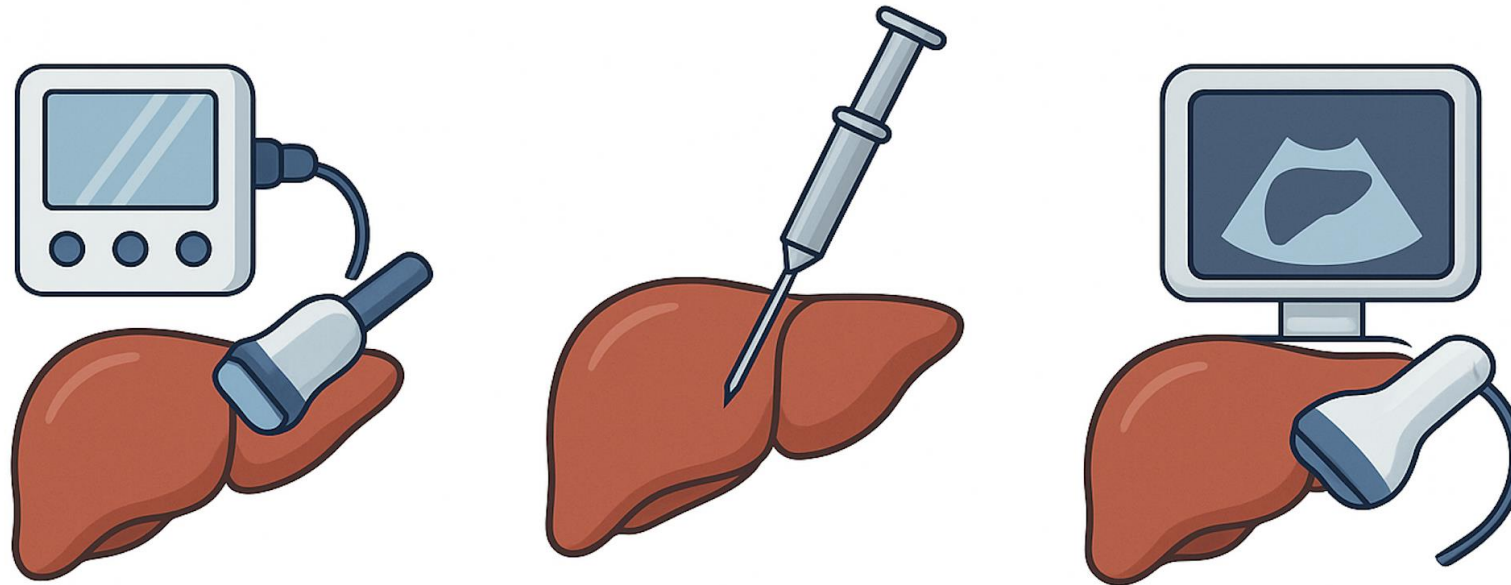


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not feasible



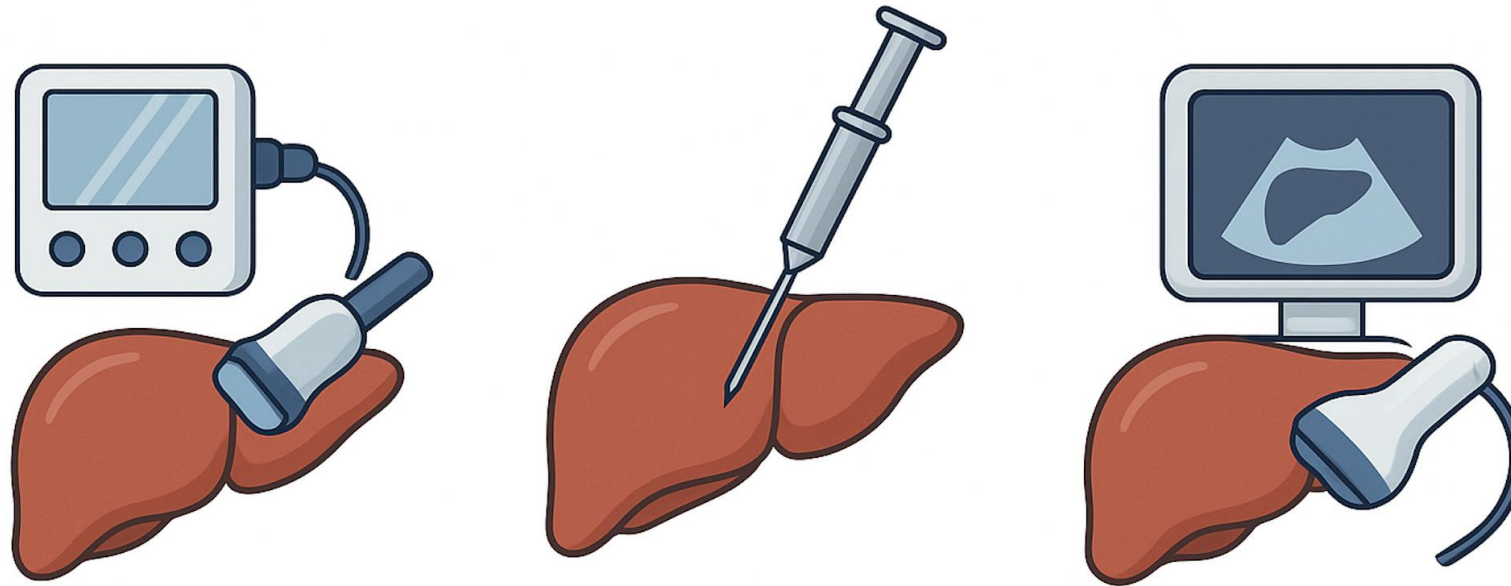
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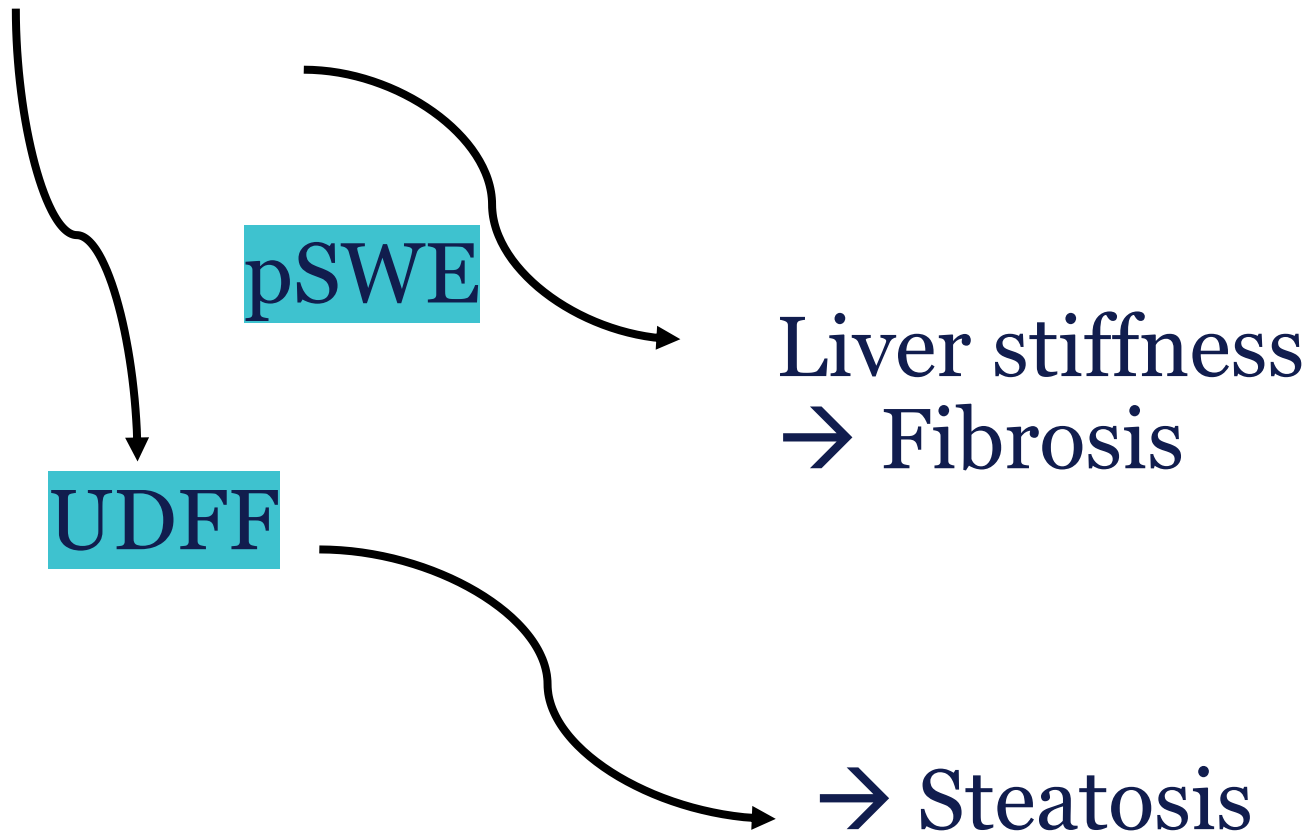
not accurate



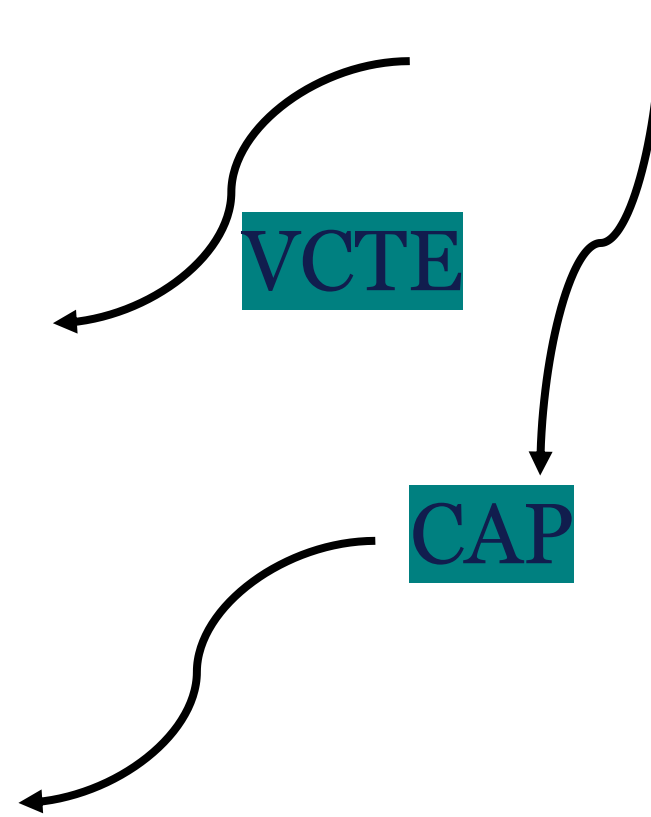
- Current ways: Liver biopsy, MRI, Fibrosis- Scores, Fibroscan (VCTE/CAP)
- Newly developed ARFI based methods: pSWE and UDFE

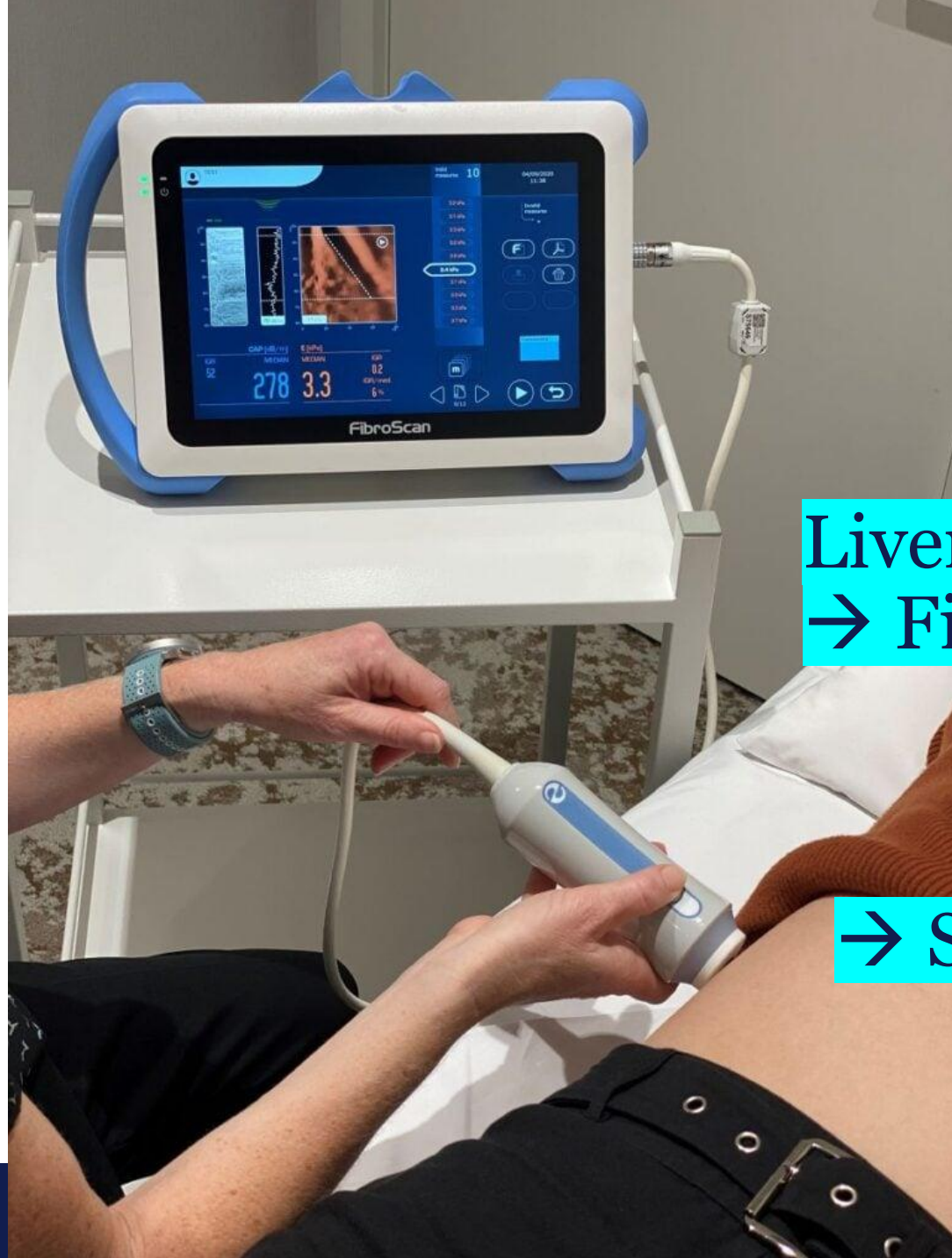
Which established methods exist and what has been tested?

ARFI based methods



Fibroscan based methods

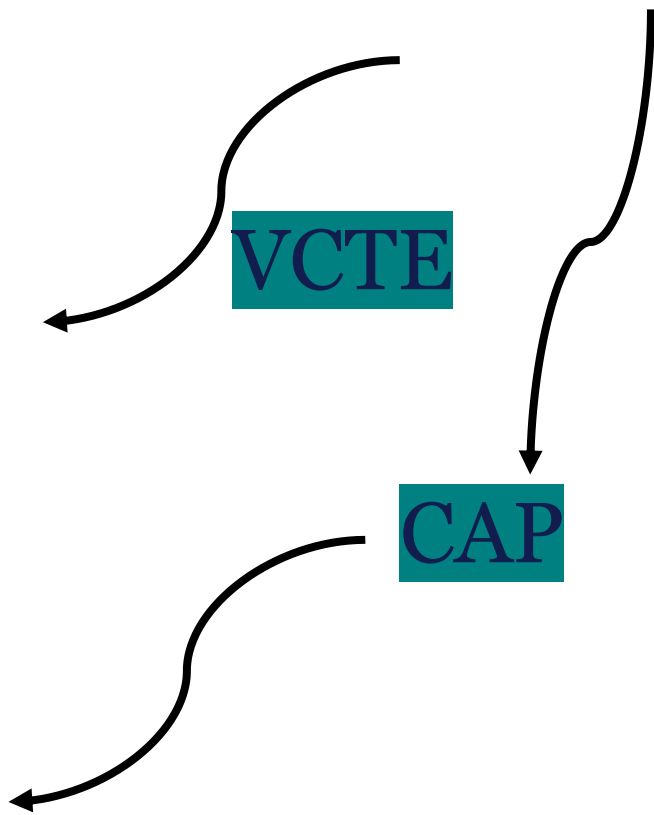




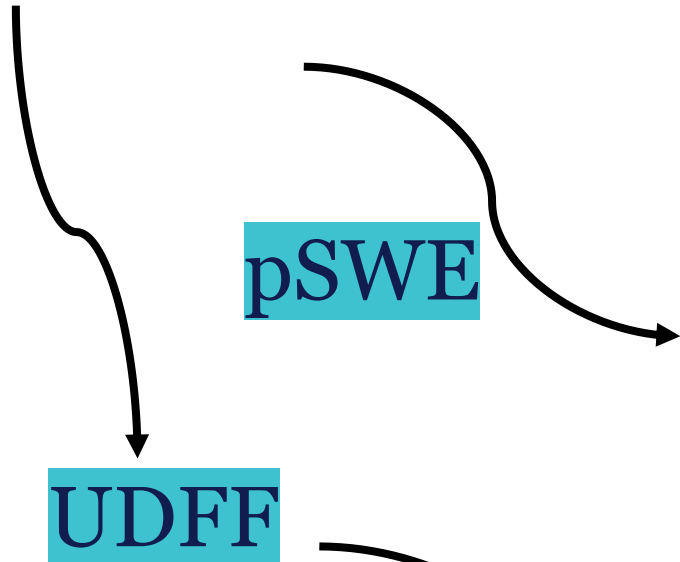
Fibroscan based methods

Liver stiffness
→ Fibrosis

→ Steatosis



ARFI based methods

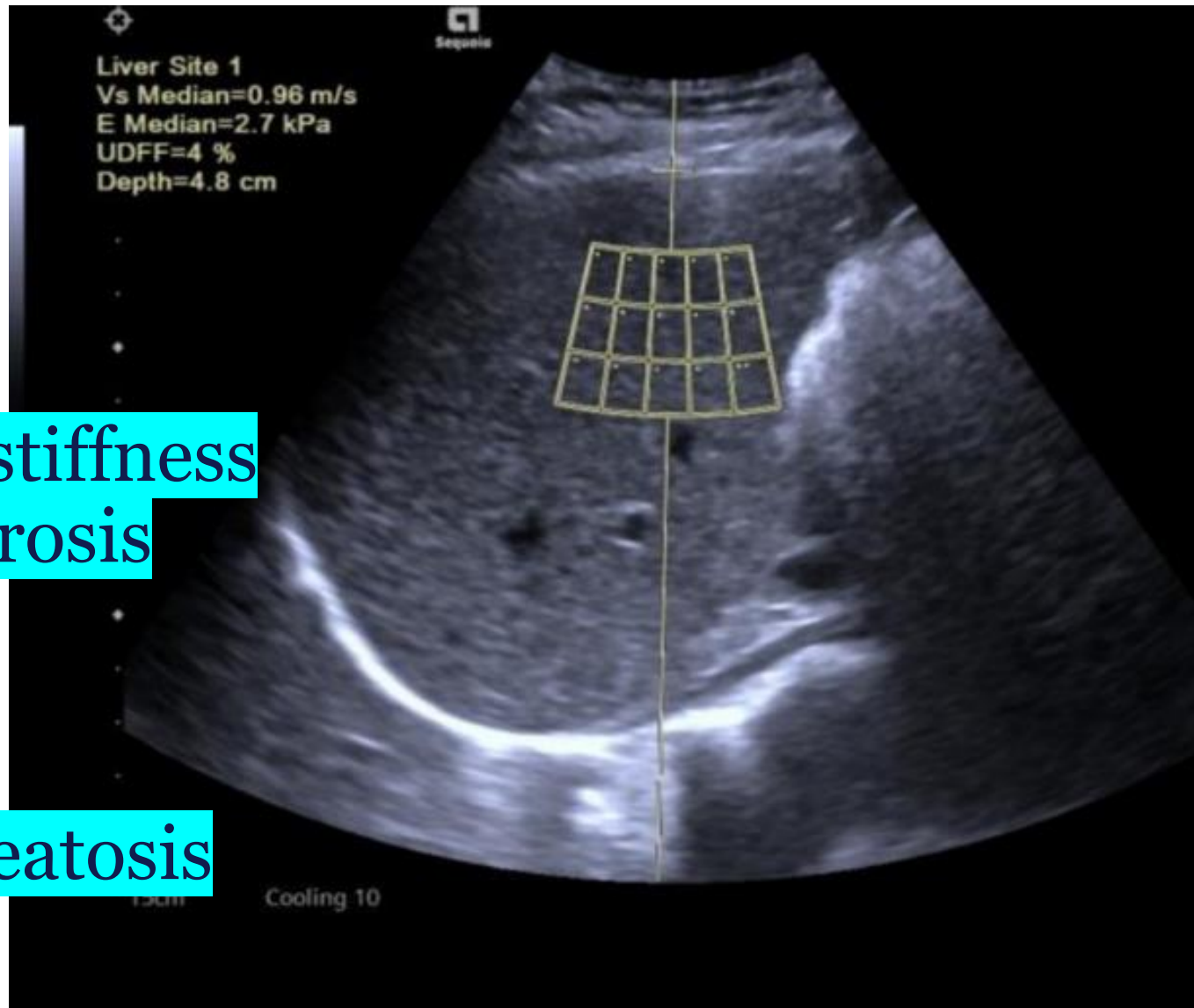


pSWE

UDFE

Liver stiffness
→ Fibrosis

→ Steatosis



Comparison pSWE/UDFF and VCTE/CAP

Aspect	pSWE / UDFF	VCTE / CAP
Technology Type	Integrated in standard ultrasound	Dedicated elastography tool
Device	Siemens, Philips, GE (Ultrasound systems)	FibroScan (Echosens)
Fibrosis Measurement	Shear wave speed via acoustic push pulse	Shear wave via mechanical vibration
Steatosis Measurement	Fat fraction via ultrasound signal analysis	Ultrasound attenuation (CAP, dB/m)
Real-time Imaging	Yes	No
Image Guidance	Yes	No
Output Units	m/s, kPa (ARFI), % fat (UDFF)	kPa (VCTE), dB/m (CAP)
Use in Obesity	Robust due to image guidance	Limited; XL probe helps
Portability	Moderate (depends on US machine)	Highly portable
Workflow Integration	Part of routine US exam	Separate device/workflow

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Comparison pSWE/**UDFF** and VCTE/**CAP**

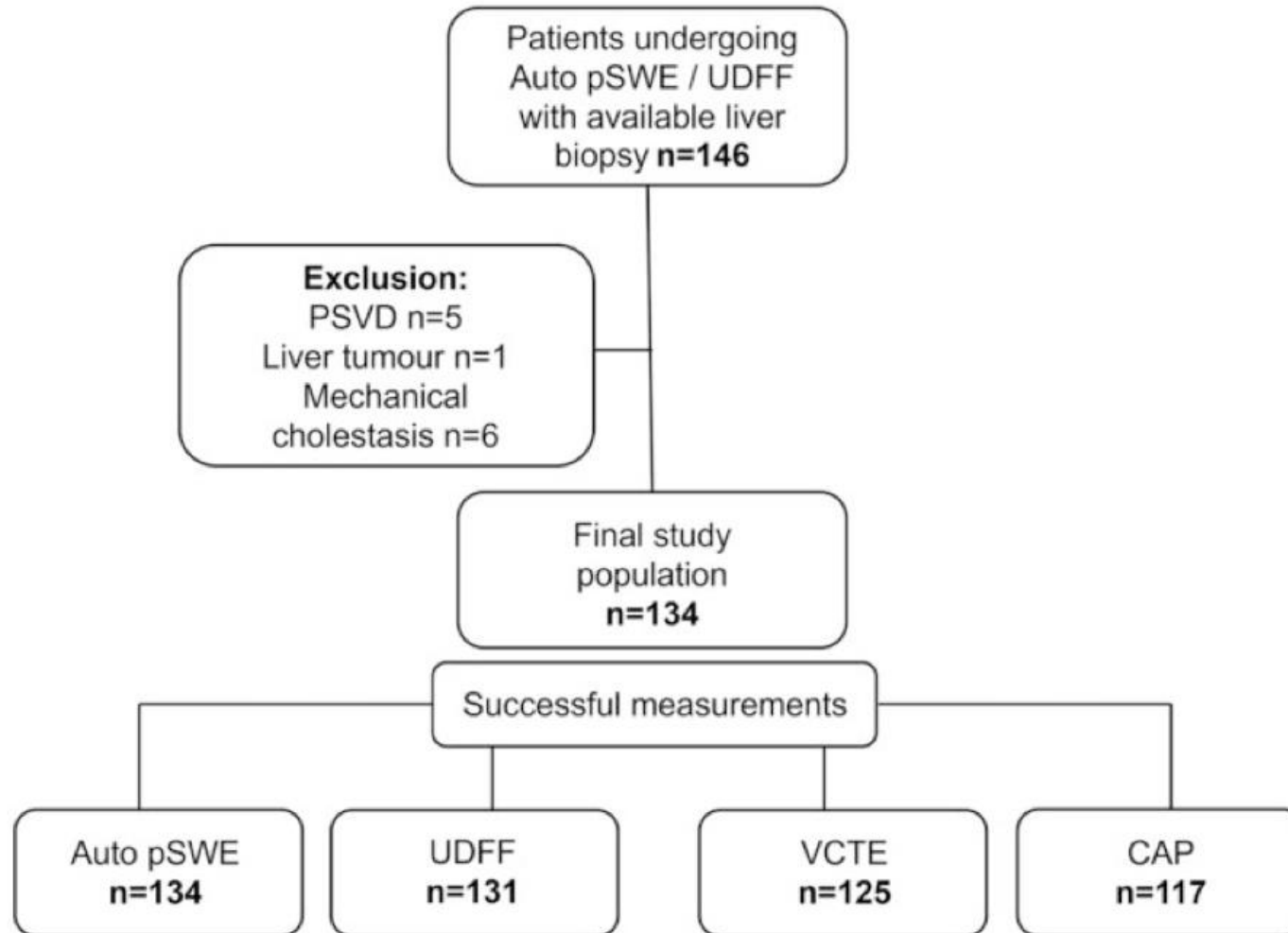
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→ More measurements needed

Methods to assess the capability of pSWE/UDFF



Study population

Patient Characteristics (n = 134)

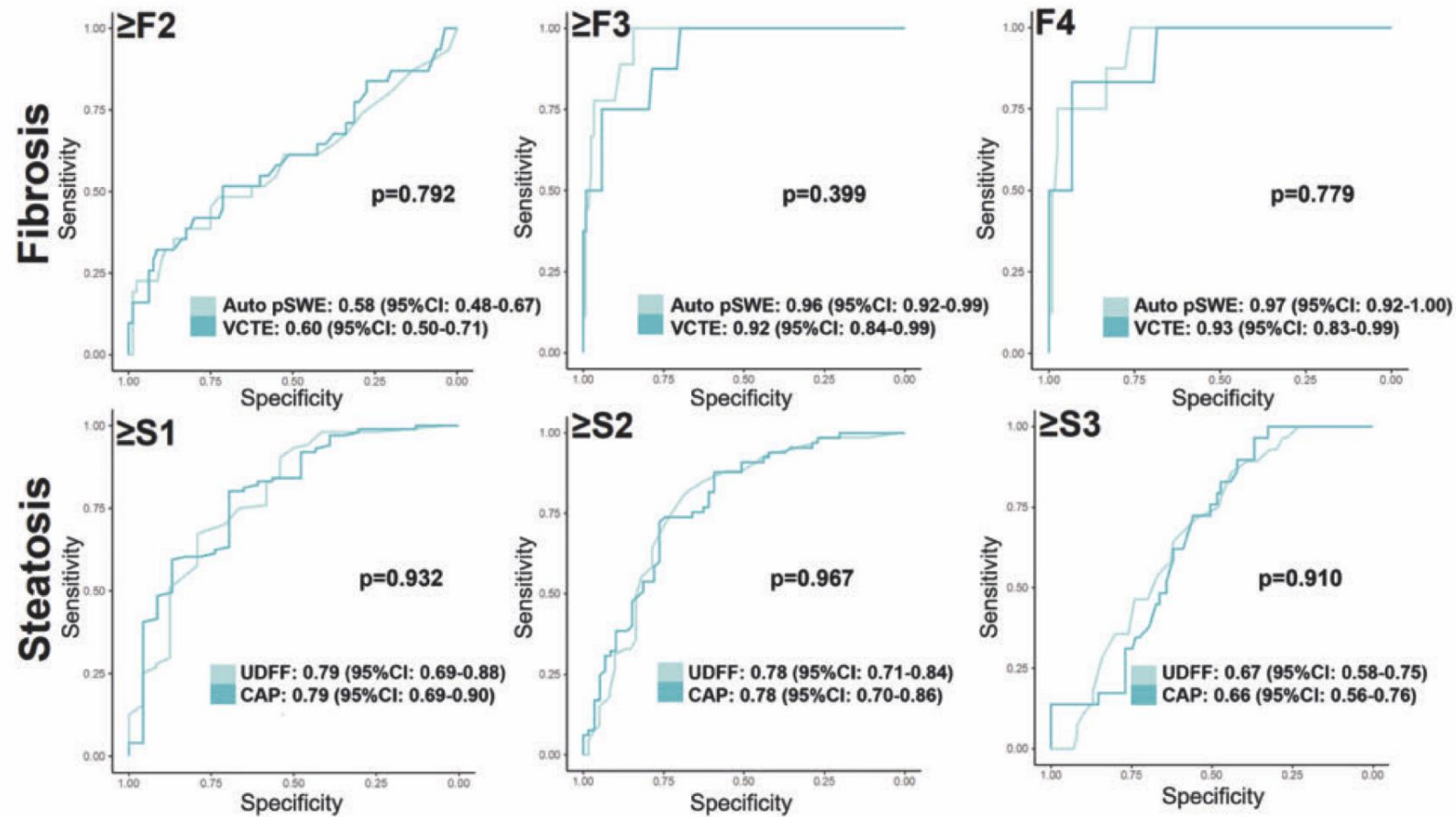
Characteristic	Value
Age, years (mean \pm SD)	42.6 \pm 13.3
Sex, n (%)	
• Male	47 (35.1%)
• Female	87 (64.9%)
BMI, kg/m ² (mean \pm SD)	42.7 \pm 10.4

Study population

Aetiology, n (%)

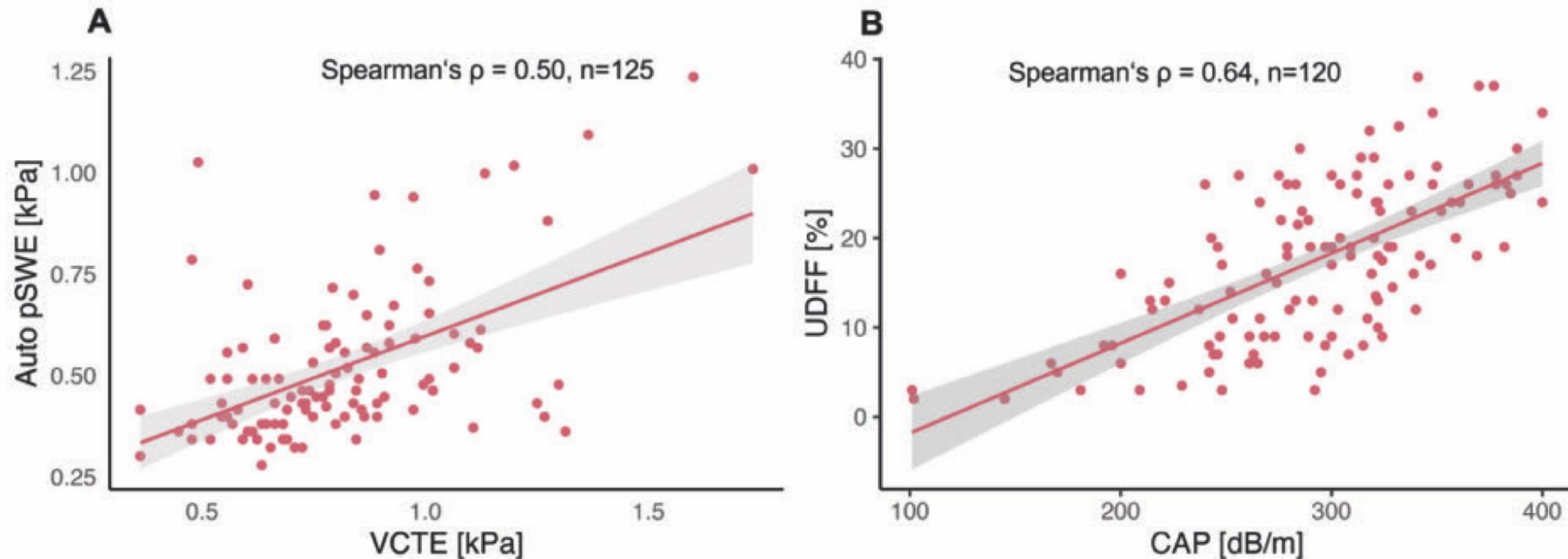
Type	n (%)
MASLD	118 (88.1%)
ArLD	3 (2.2%)
Viral	2 (1.5%)
Others	11 (8.2%)

Performance compared to biopsy



ROC curves for the detection of significant fibrosis, advanced fibrosis and cirrhosis
 ROC curves for the detection of mild, moderate and severe steatosis

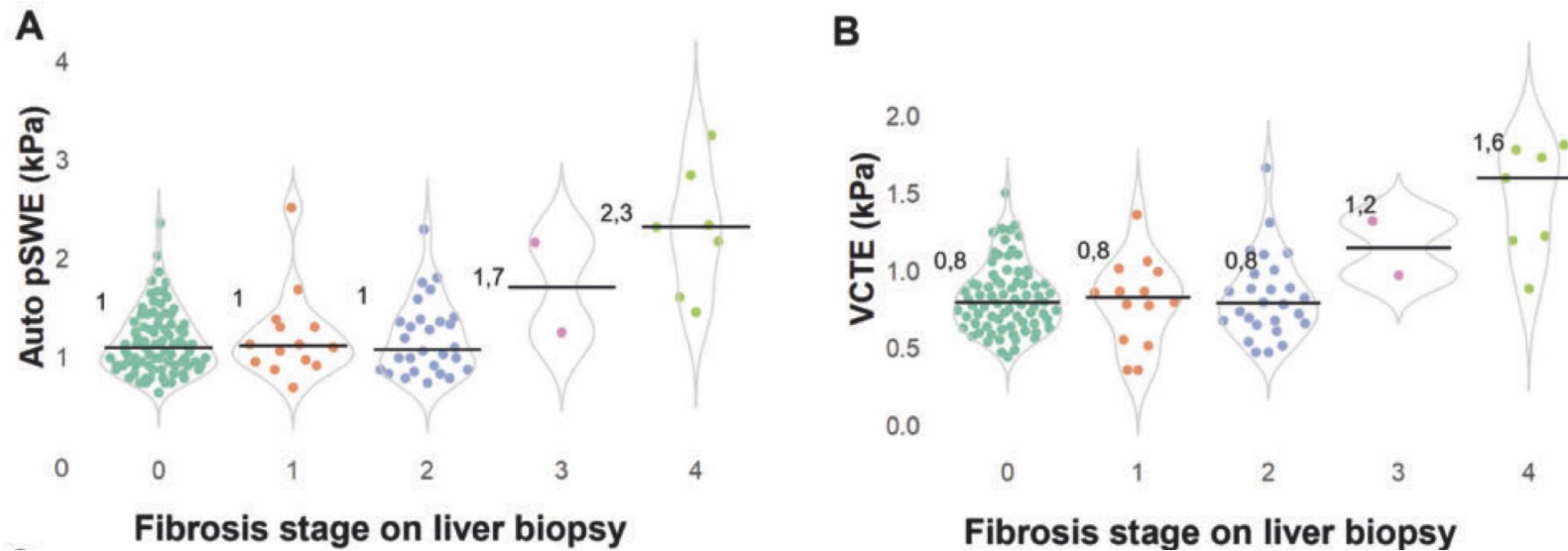
Relation between non-invasive measurements



- Moderate correlation between VCTE and Auto pSWE (Spearman's $\rho = 0.50$, $p < 0.001$)
- Strong correlation between CAP and UDFF (Spearman's $\rho = 0.64$, $p < 0.001$)

Performance compared to biopsy

FIBROSIS (pSWE/VCTE)

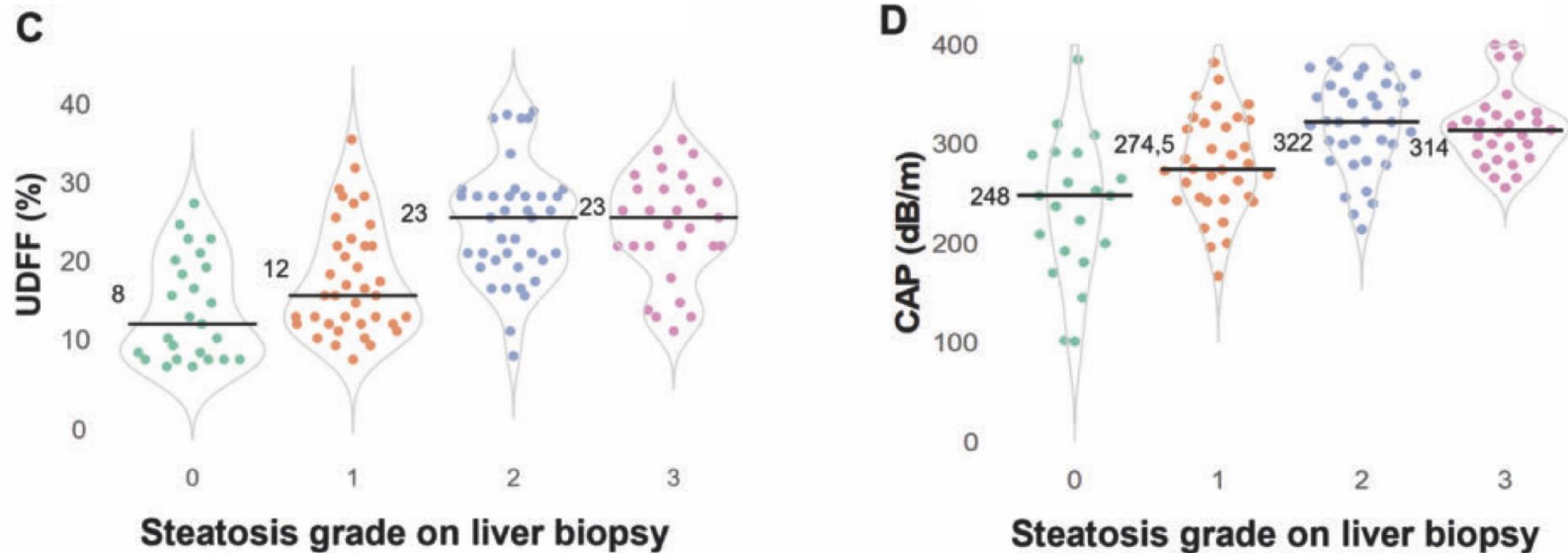


No statistical difference

- in the accuracy between Auto pSWE and VCTE
- between measurements of 1 Auto pSWE and the median of 5 VCTE

Performance compared to biopsy

STEATOSIS (UDFF/CAP)



No statistical difference

- in the accuracy of any stage of steatosis between UDFF and CAP
- between 1 UDFF acquisition and the median of 5 CAP measurements

Take home message

- MASLD is a fast growing threat
- Assessment of fibrosis is more accurate than steatosis
- ARFI based methods are safe, easy and fast
- No differences in the accuracy of pSWE/UDFF and VCTE/CAP
- pSWE/UDFF is faster and can be included in routine workup



Thank you!