Liver Care and Technology Continuum

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Objectives

- Outline liver disease and statistics in today's world
- Discuss how ultrasound technologies can be applied to the liver care pathway
- Analyze the benefits of ultrasound technologies in the diagnosis, treatment and monitoring of liver disease processes

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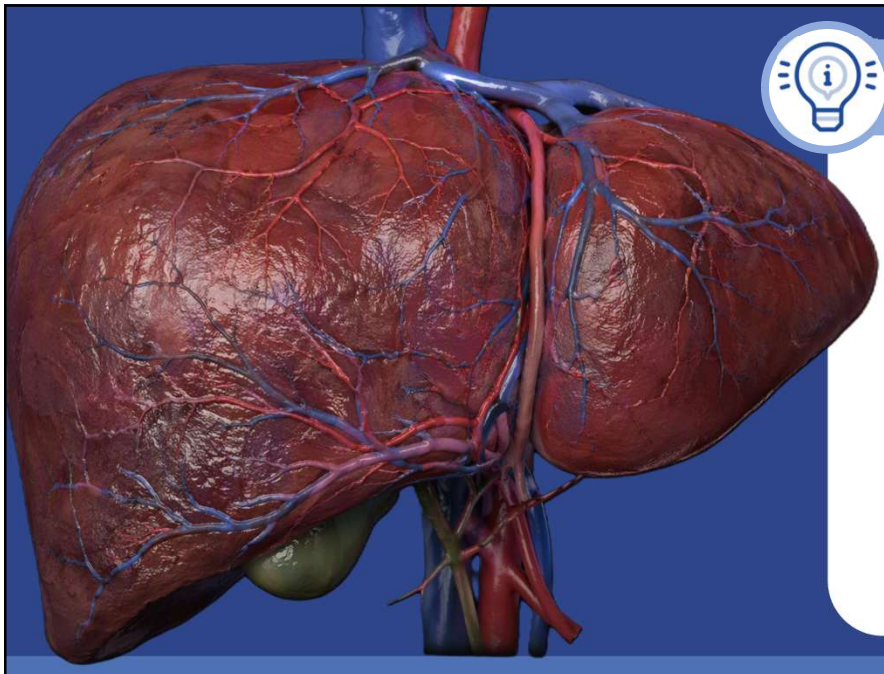

Liver

- Largest internal organ
- Vital organ;
  Performs 500+ functions
  - Filtration
  - Digestion
  - Blood maintenance
  - Energy management
  - Regeneration

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2026 SDMS Annual Conference

Liver Disease

conditions that affect and or damage the liver and prevent proper functioning

Common Diseases

- Metabolic liver disease MASLD; MASH
- Hepatitis
- Alcohol-associated liver disease
- Autoimmune disease
- Genetic disease
- Cancer

Symptomology

Early-stage liver disease often does not present with symptoms
As disease progresses:

- Jaundice
- Pain; swelling
- Abnormal urinalysis
- Fatigue
- Unexplained weight loss
- Nausea, loss of appetite

Disease Progression

- Hepatitis
- Fibrosis
- Cirrhosis
- End-stage liver disease

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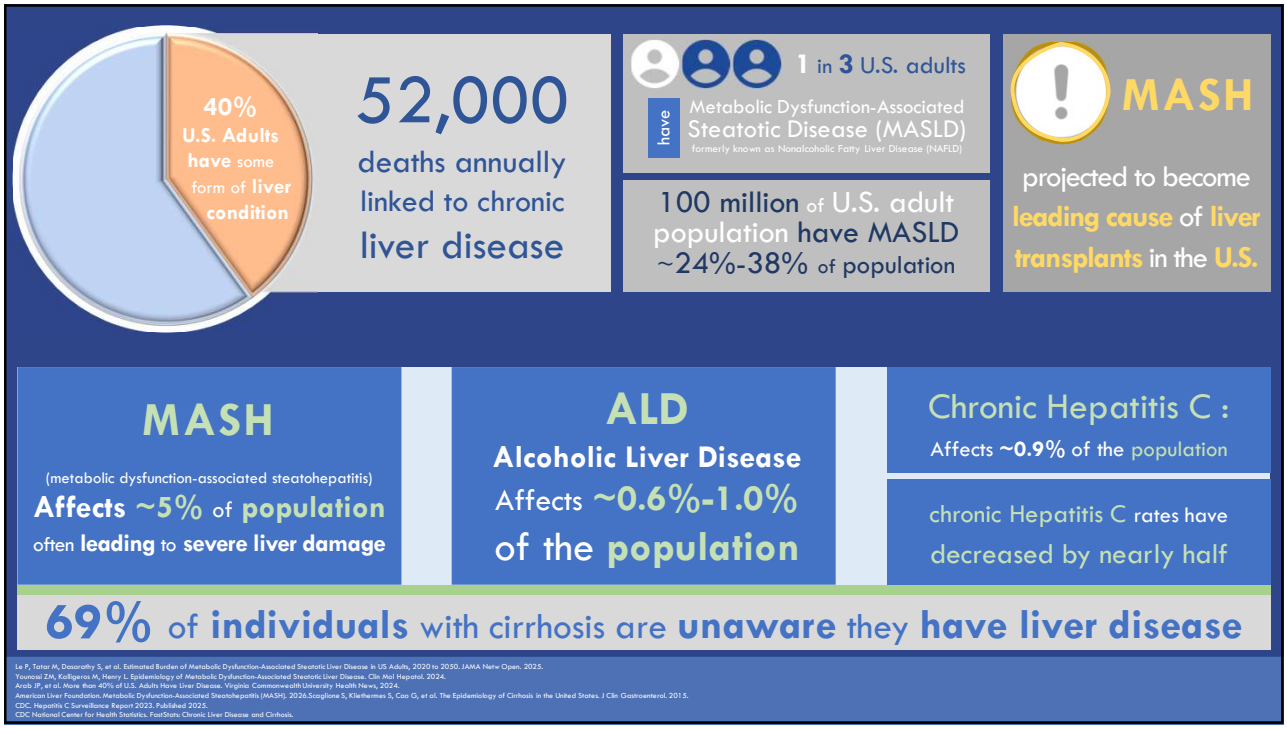

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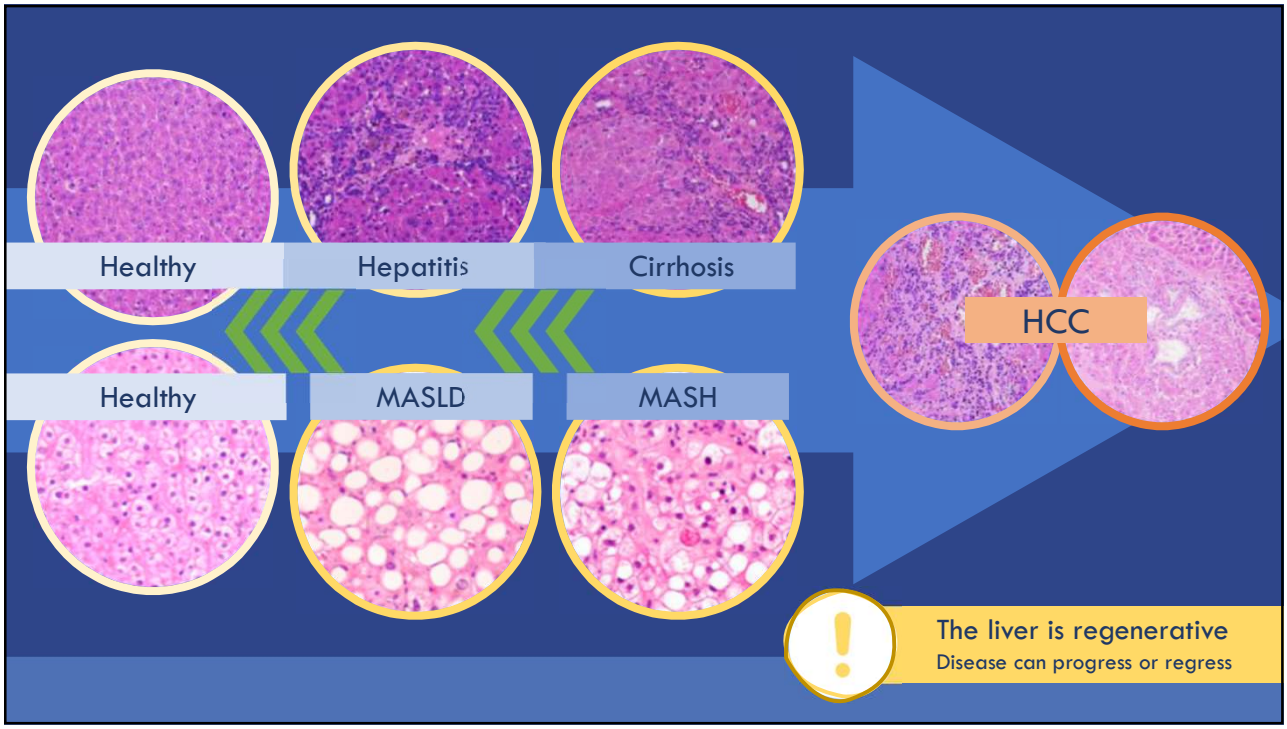

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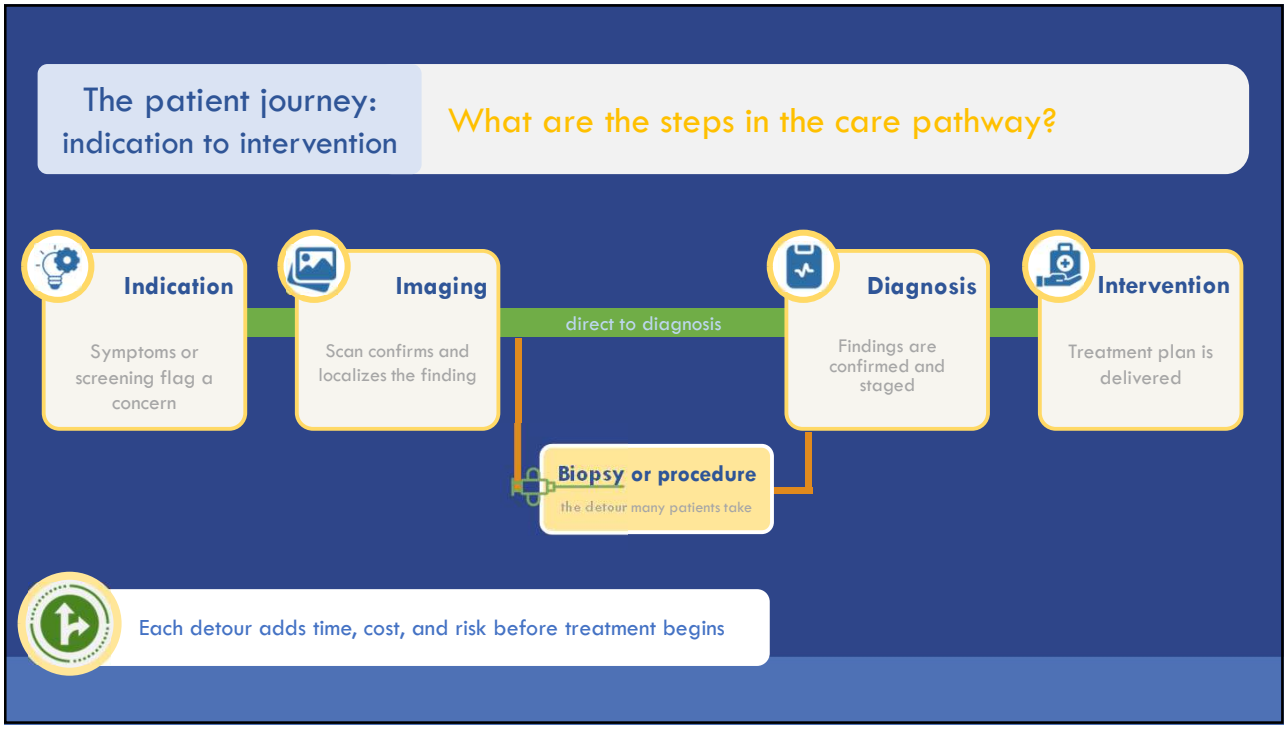

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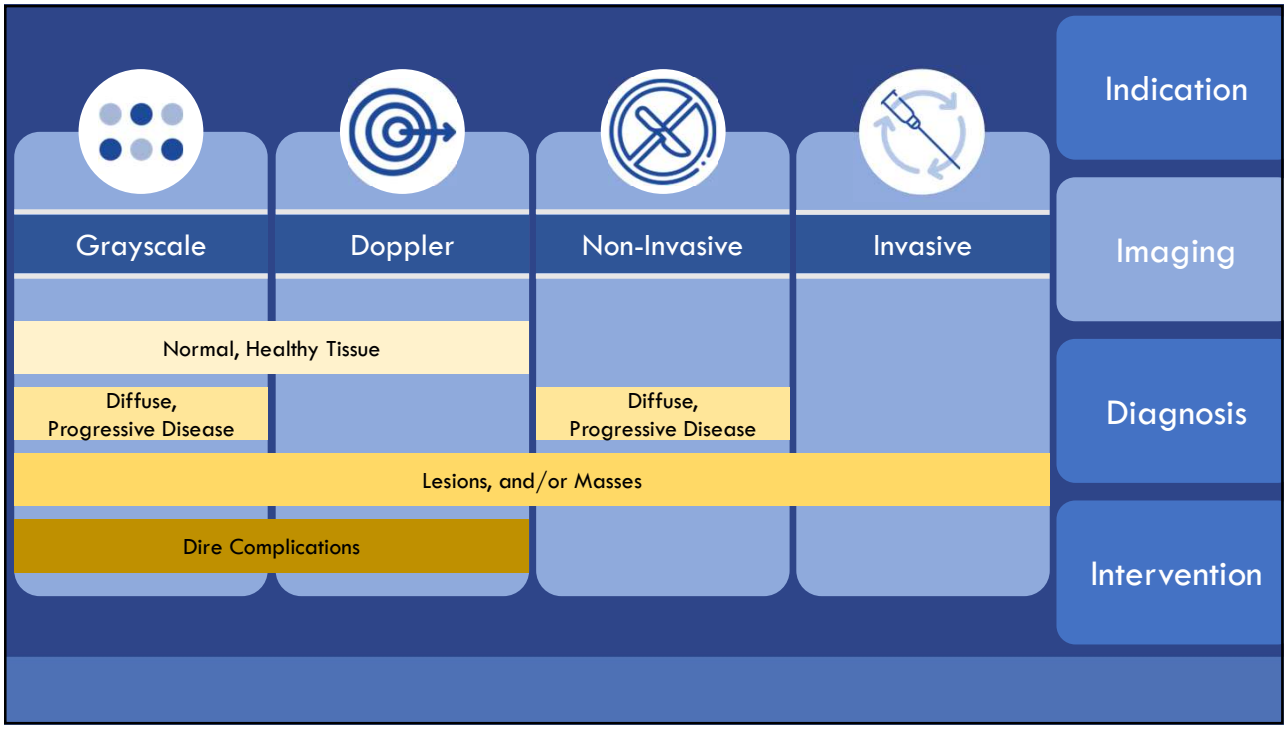

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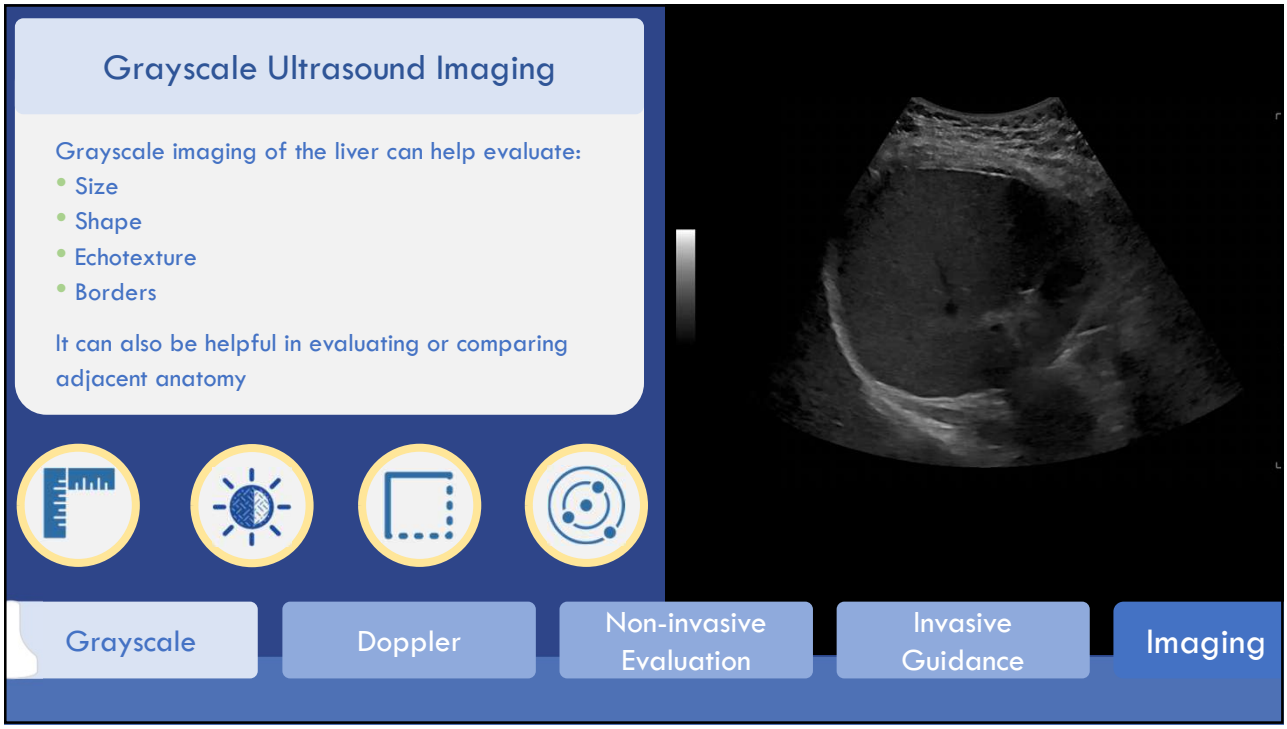

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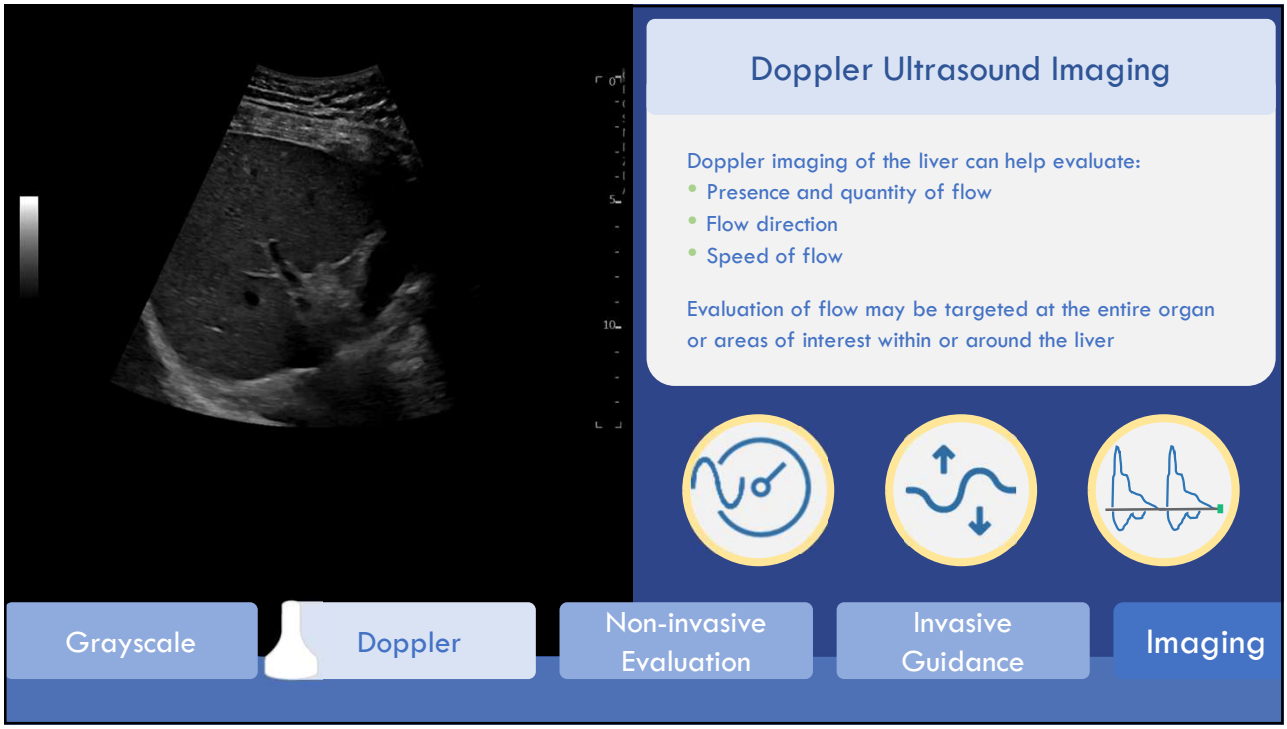

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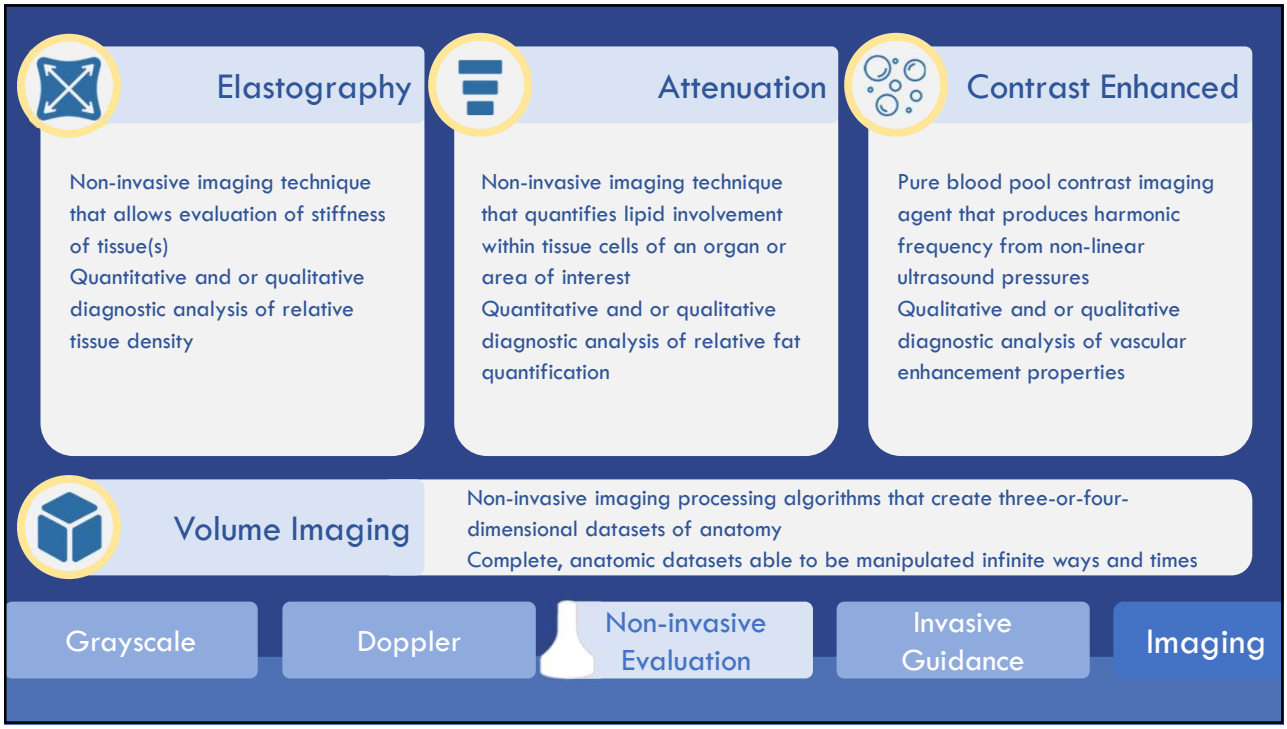

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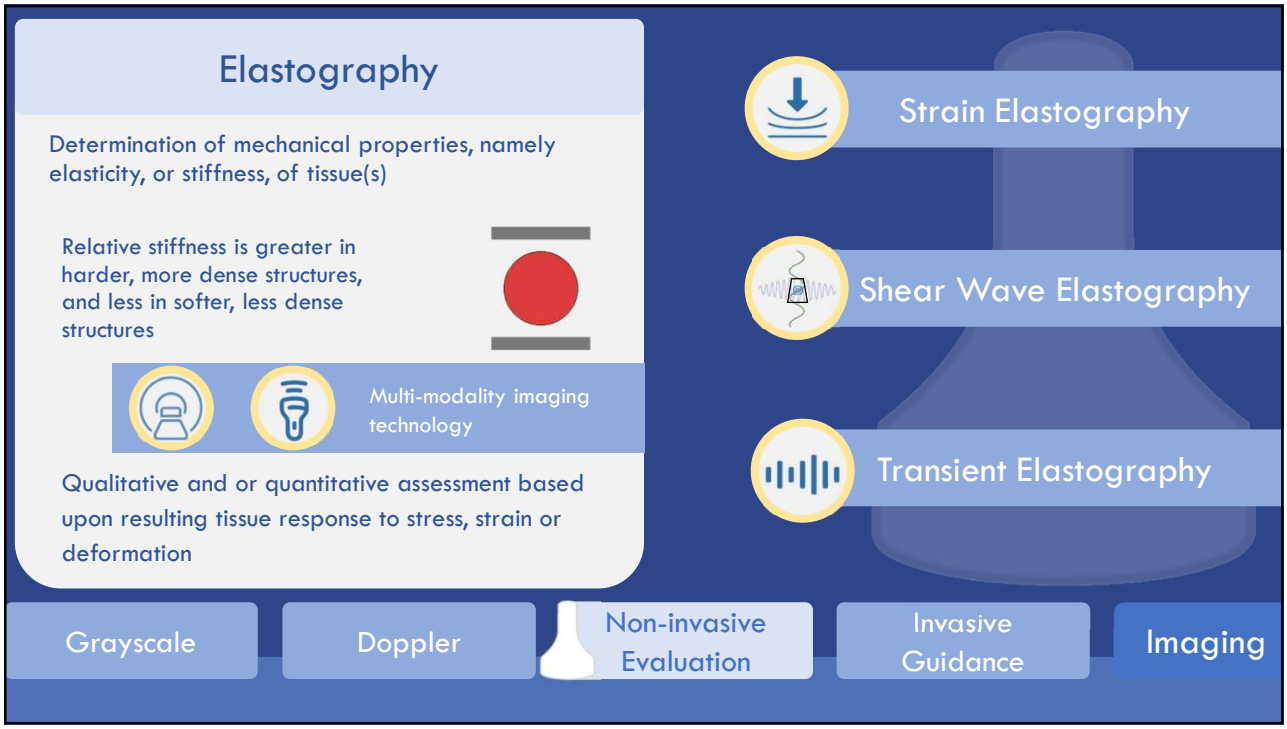

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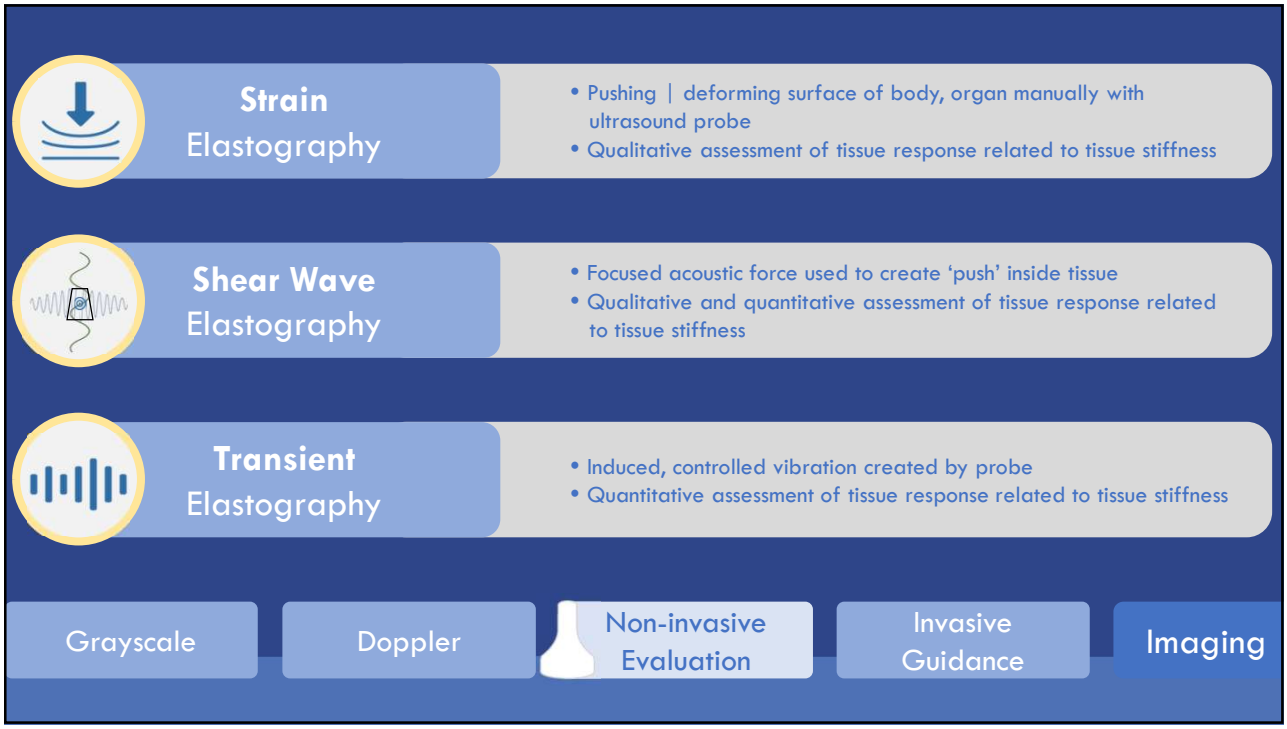

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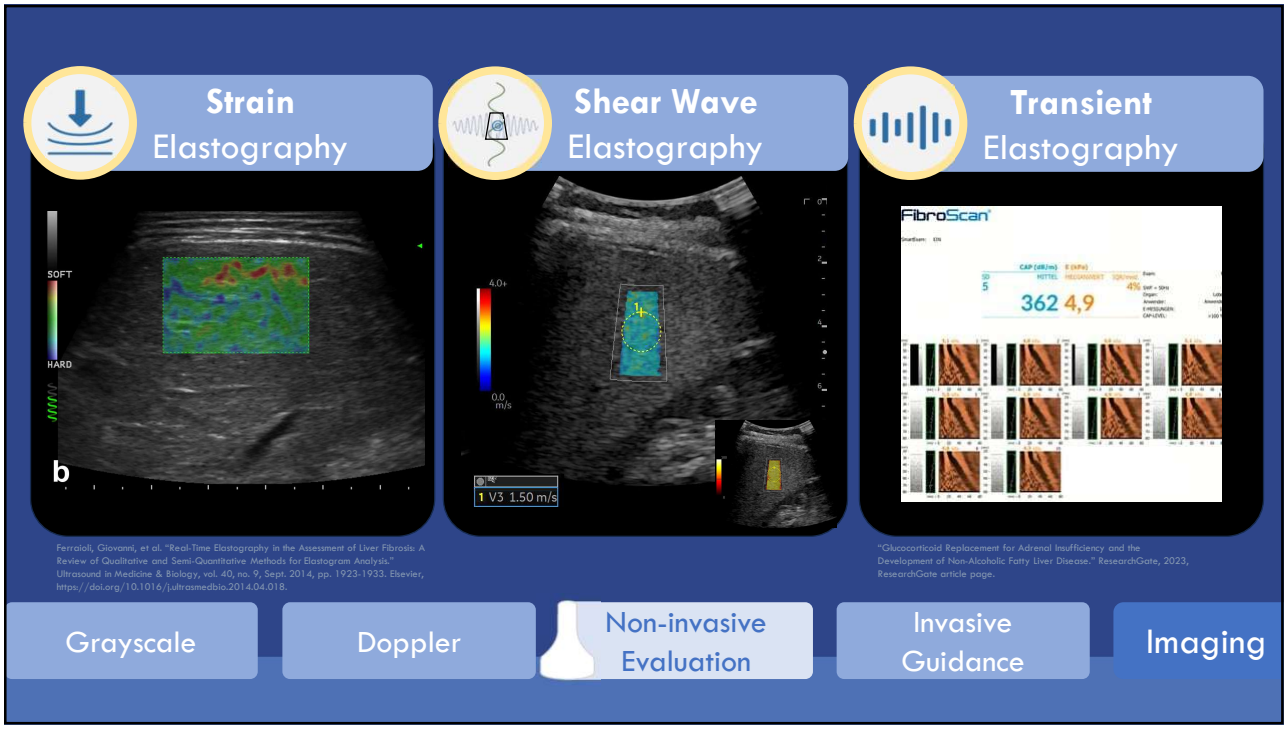

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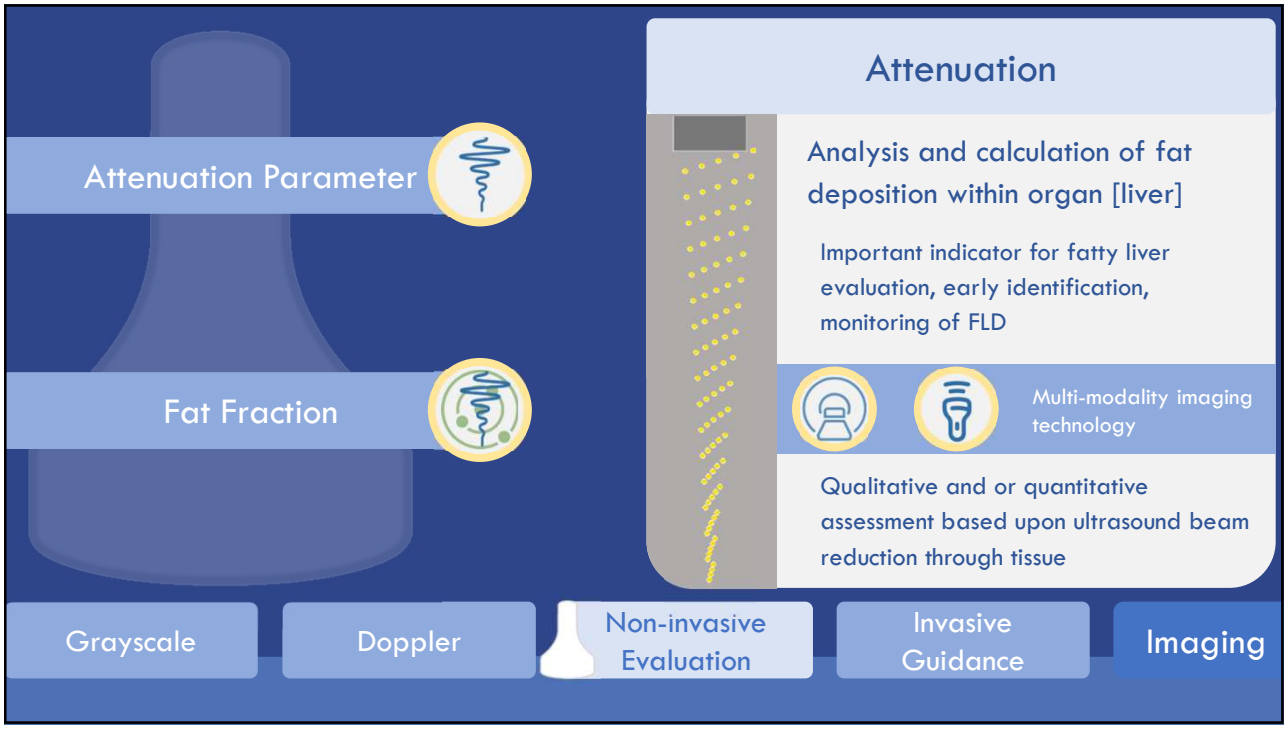

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- Measures representative attenuation value
- Value is compared to [vendor specific] cut-off chart for analysis
- Qualitative and quantitative [attenuation coefficient] analysis of lipid deposit within tissue

Attenuation Parameter



- Measures steatotic quantification percentage (MRI-PDFF correlated)
- Qualitative and quantitative analysis of lipid deposit within tissue
- Algorithm(s) consider: Attenuation coefficient, Integrated Backscatter Coefficient, and/or Signal-to-noise Ratio

Fat Fraction



Grayscale | Doppler | Non-invasive Evaluation | Invasive Guidance | Imaging

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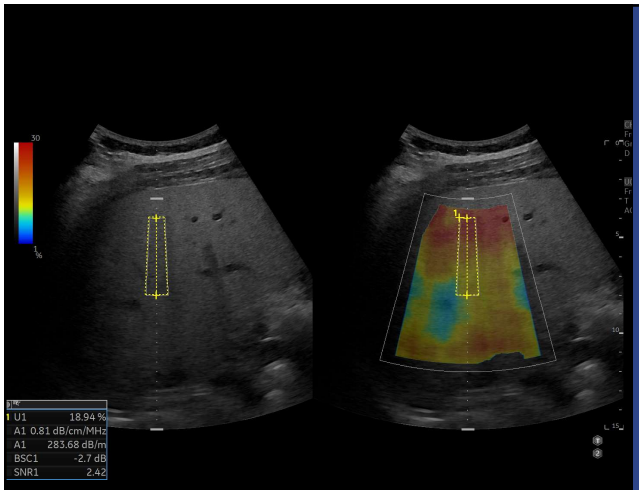

Attenuation

Qualitative and quantitative analysis of lipid involvement within liver cells

Attenuation Parameter

→ Attenuation Coefficient dB/cm/MHz

Fat Fraction

→ Attenuation Coefficient, Integrated Backscatter Coefficient, Signal-to-noise ratio





Grayscale | Doppler | Non-invasive Evaluation | Invasive Guidance | Imaging

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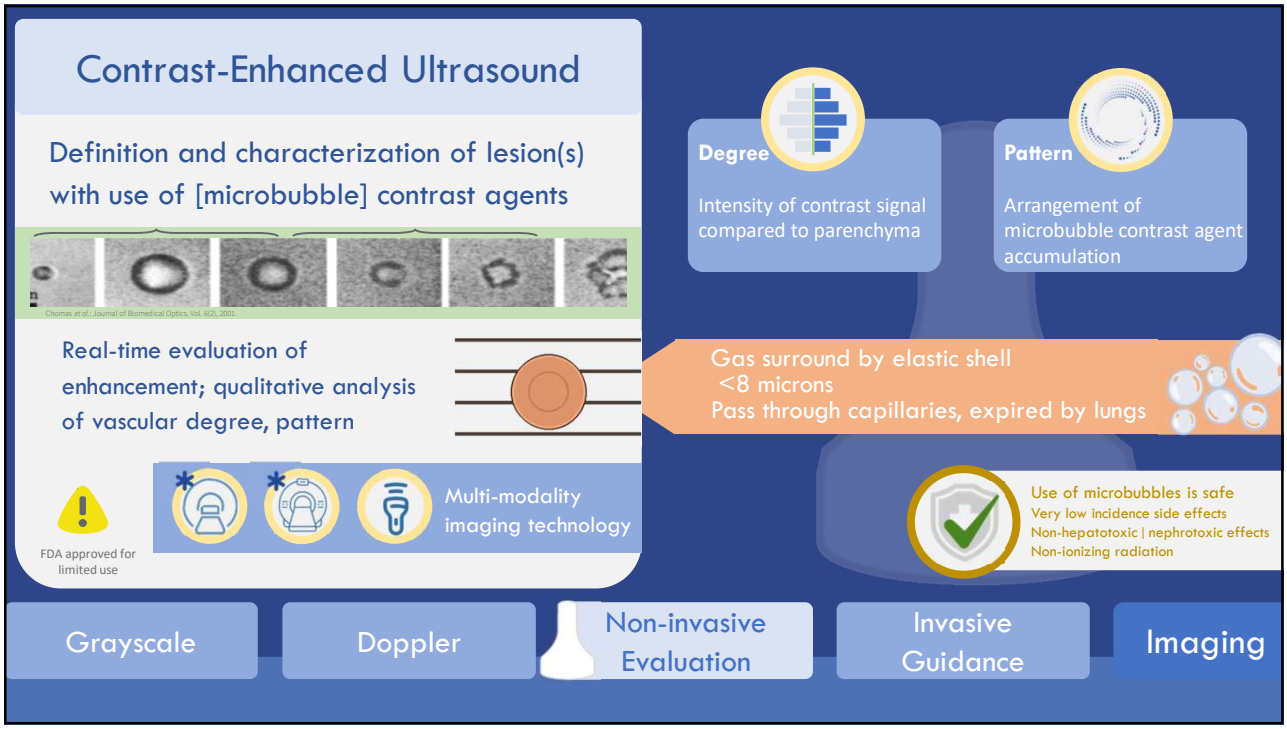

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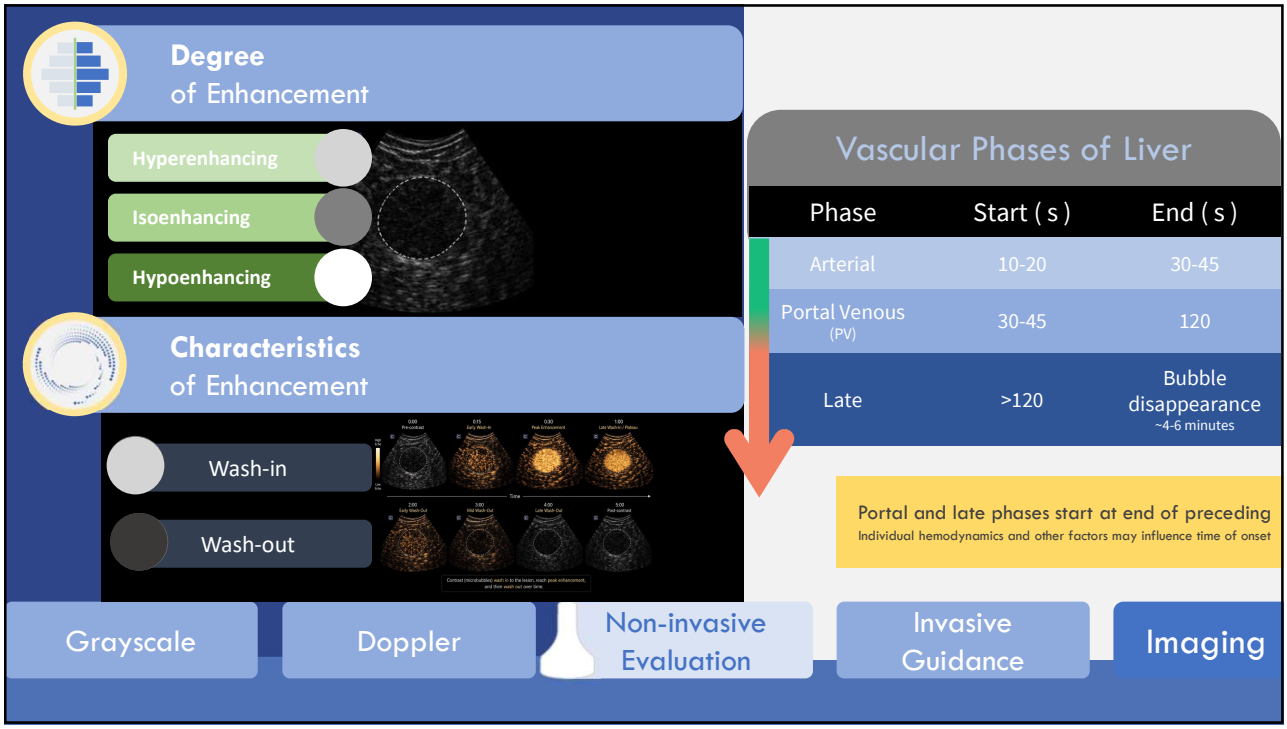

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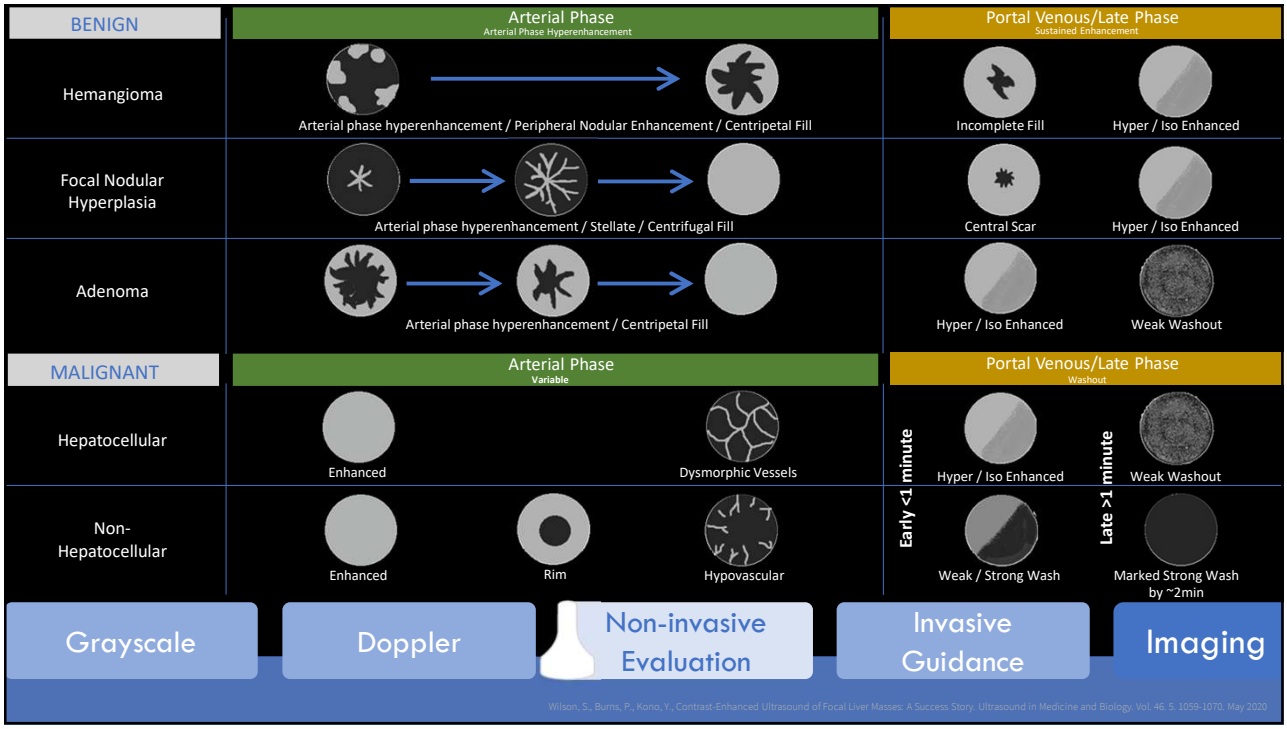

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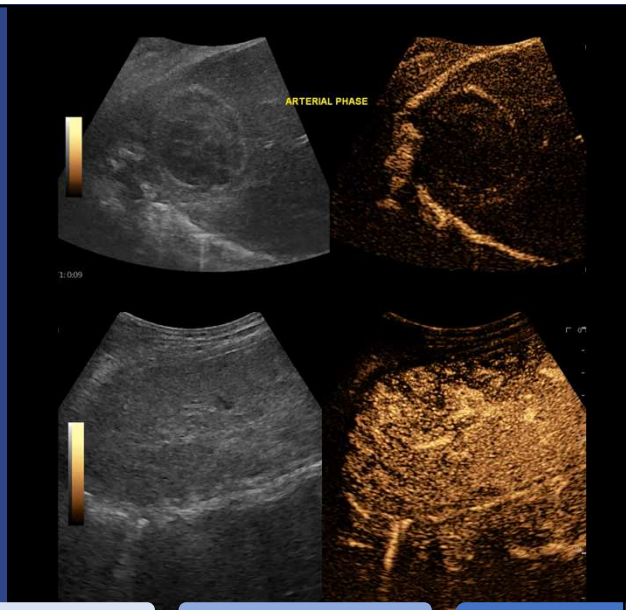
Contrast-Enhanced Ultrasound

The use of CEUS allows practitioners to evaluate lesions with noninvasive methods.

General rule:
Benign lesions → remain enhanced
wash-in patterns via by morphology

Malignant lesions → lose enhancement
timing of wash-out vary

Lesions are watched through wash-in; monitored until wash-out. Most exams ~5 minutes.



Grayscale | Doppler | Non-invasive Evaluation | Invasive Guidance | Imaging

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Fusion Imaging

Match real-time ultrasound with [imported] DICOM® dataset
Probes with embedded sensors; brackets available for probes with sensors not embedded

GPS Lesion Marking

Visually track position within body
Mark and track selected points in body while scanning

Needle Tracking | Guidance

Sensor embedded in tip of needle, or tracking mounted on hub of needle
Track needle position with live or projected display
Plan, monitor procedures with real-time data

Grayscale | Doppler | Non-invasive Evaluation | Invasive Guidance | Imaging

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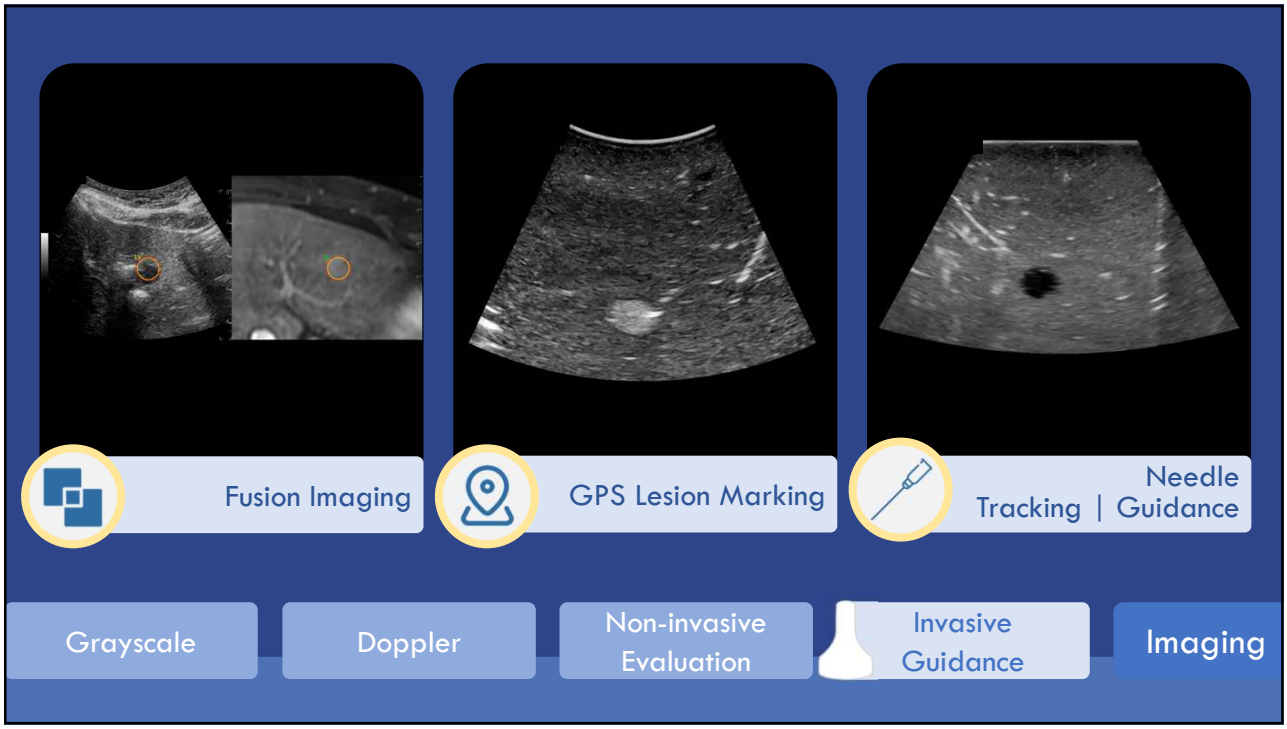

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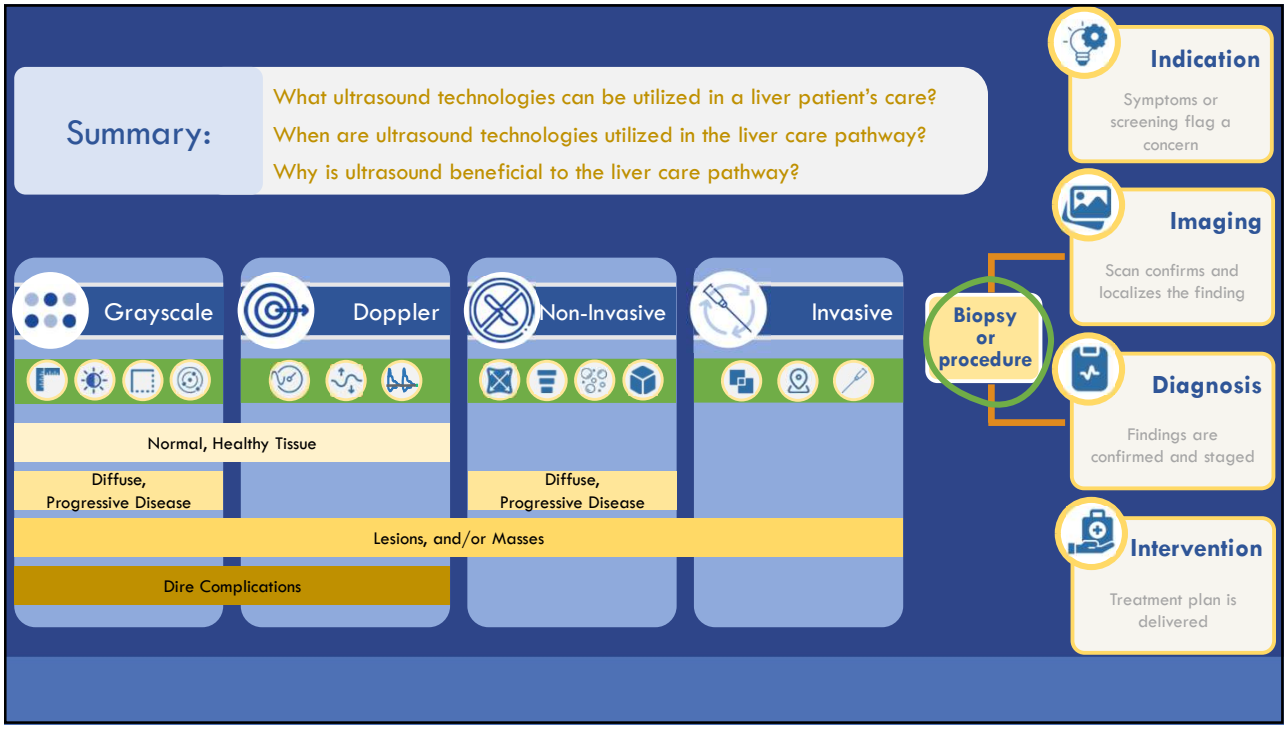

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- Improve patient care with minimization of risk(s)
- Reduce patient impact of extensive care pathway(s)
- Reduce economic repercussions of liver health impacts

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Summary

- ✓Outlined liver disease and statistics in today's world
- ✓Discussed how ultrasound technologies can be applied to the liver care pathway
- ✓Analyzed the benefits of ultrasound technologies in the diagnosis, treatment and monitoring of liver disease processes

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