



Non-Invasive Testing in NASH

Kim Pfothauer, DO

Assistant Professor

Director of Clerkship Curriculum

Family Medicine and Diabetology

Michigan State University

College of Osteopathic Medicine



Vibration-Controlled Transient Elastography (VCTE)

- Ultrasound measures velocity of low-frequency elastic shear waves to measure hepatic stiffness
- Known as FibroScan
- Evaluates both fibrosis and steatosis
- AUROC .93 (95% CIs: 0.89-0.96)





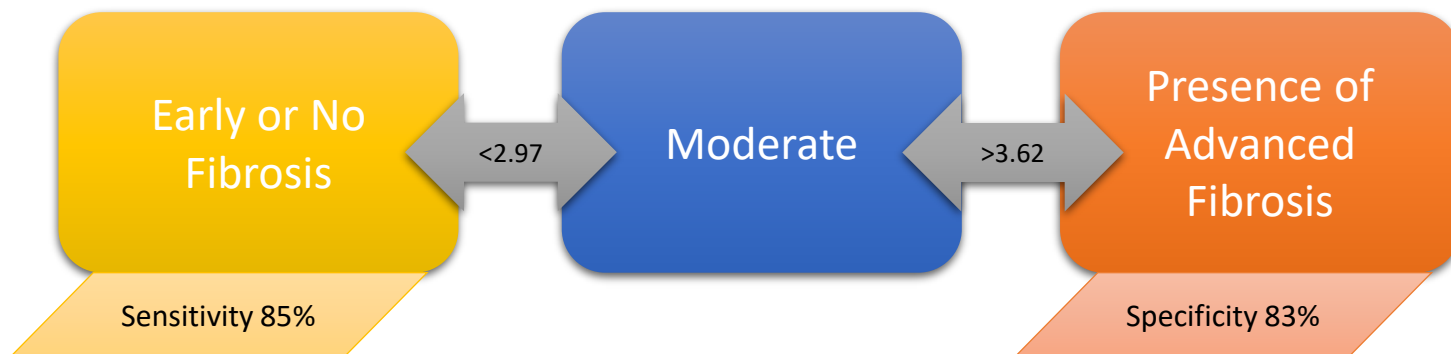
Vibration-Controlled Transient Elastography (VCTE)

- Benefits
 - Performed at bedside in an ambulatory office
 - Quick to perform, easy to learn
 - Good reproducibility
- Weaknesses
 - Difficult in patient with BMI >30 kg/m²)
 - Unable to discriminate between intermediate stages of fibrosis
 - Over-estimation of fibrosis if other liver disease present



Magnetic Resonance Elastography (MRE)

- Uses MRI to estimate the degree of fibrosis through mechanical waves through the liver
- Examines the whole liver
- AUROC for identifying $\geq F3$ vs. F0-2: 0.93 (95% CIs: 0.90-0.96)





Magnetic Resonance Elastography (MRE)

- Benefits
 - Uses regular MRI machine
 - Useful in ascites and obesity
 - High performance for cirrhosis
 - Excellent for identifying different stage of fibrosis
- Weaknesses
 - Costly and time-consuming
 - May not be available in all areas



Primary Care

- ~~Ultrasound only~~
- Need to stage NASH after diagnosis of NAFLD
- Need clarification on most useful tools
 - NAFLD Fibrosis Score
 - FIB-4
 - FibroSure/FibroTest
 - ELF Score
 - BARD Score
 - APRI Score
- Use of sequential NIT with indeterminate results



NAFLD Fibrosis Score

- Based on six easily available variables:
 - Age, BMI, presence of hyperglycemia, platelet count, albumin, and ALT/AST ratio
 - Formula available online (nafldscores.com)
- Useful in identifying patients with a higher likelihood of F3 or F4
- AUROC: 0.85 (95% CI: 0.74-0.74)





FIB-4

- Can be calculated in the office with easily available variables
 - Age, platelet count, ALT, AST
- Useful in identifying patients with a higher likelihood of F3 or F4
- AUROC 0.78 (95% CI: 0.78-0.78)





Other Scoring Systems

- FibroSure/FibroTest
 - Proprietary serum
 - Haptoglobin, α 2-macroglobin, apolipoprotein A1, total bilirubin, and GGT
- Enhanced Liver Fibrosis (ELF) Score
 - Combines three biomarkers: hyaluronic acid, tissue inhibitor of metalloproteinase 1, amino-terminal peptide of procollagen III
- Aspartate aminotransferase/Platelet Ratio Index (APRI)
 - Higher sensitivity than specificity
- BARD Score
 - BMI, AST, ALT, Diabetes
 - Strong negative predictive value to rule out fibrosis



Sequential Use of NIT

- NFS and FIB-4
 - Better than other indices
 - As good as MRE
- Sequential use can improve diagnosis
 - Rule in/out with NFS and/or FIB-4
 - If intermediate to high risk -> TE
 - If failure (obesity, intermediate stages) -> MRE

