



Scientific Assembly

B O S T O N
2 0 2 1

OCTOBER 25-28, 2021

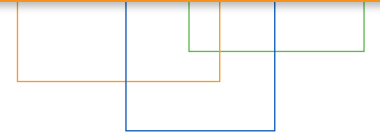
A Double-Blinded Comparison of Low-Cost Ultrasound Media: A Simulation and In-Vivo Analysis

Heesun Choi, DO
Director of EM Ultrasound
Kingman Regional Medical Center



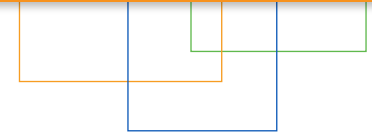
**Together
Again**
Boston
Convention
& Exhibition
Center





Disclosure

- I have no current or past relationship with commercial entities

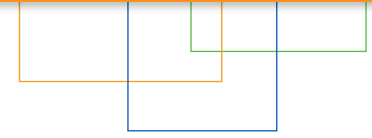


Objective 1: Ultrasound Gel vs. Lotion?



VS

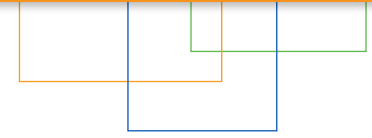




Objectives 2: EM US Fellowship Trained Physician vs EM Resident Physician



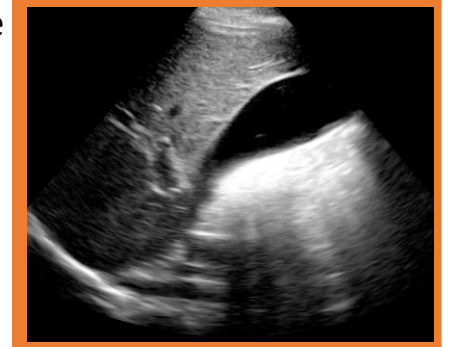
Determine the clinical efficacy among diagnosticians of varying degrees of expertise



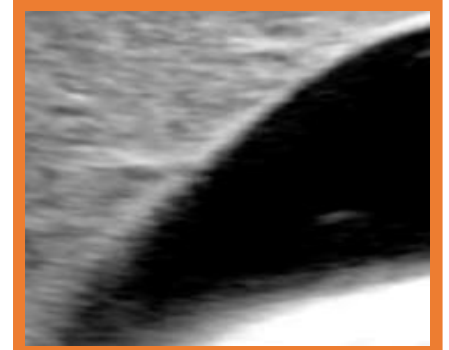
Methods

- Two diagnostician (one fellowship trained & one resident physician)
- Views of LUQ, RUQ, GB
 - ▶ RUQ: Inferior point of Morrison's pouch
 - ▶ LUQ: Inferior point of the Splenorenal recess
 - ▶ Gallbladder: Anterior wall of the gallbladder
- Ultrasound gel and five household gel analogs (water, isopropyl alcohol, mineral oil, lotion, conditional, aloe vera gel)
- ImageJ image processing software to determine image quality
- Image quality was assessed via the area of the image exhibiting the, highest 25% of signal intensity

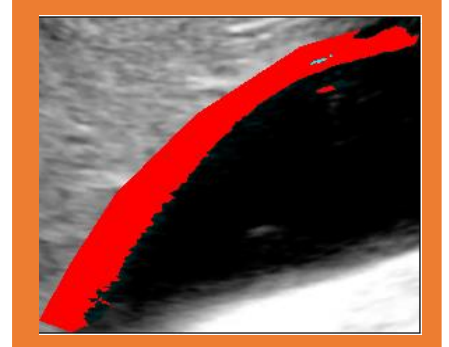
Diagnostician Selected Still frame

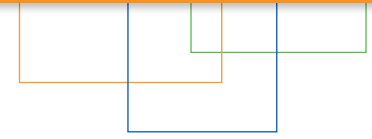


Landmark Demarcation



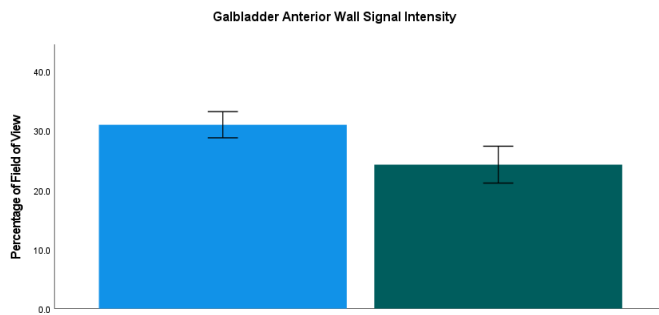
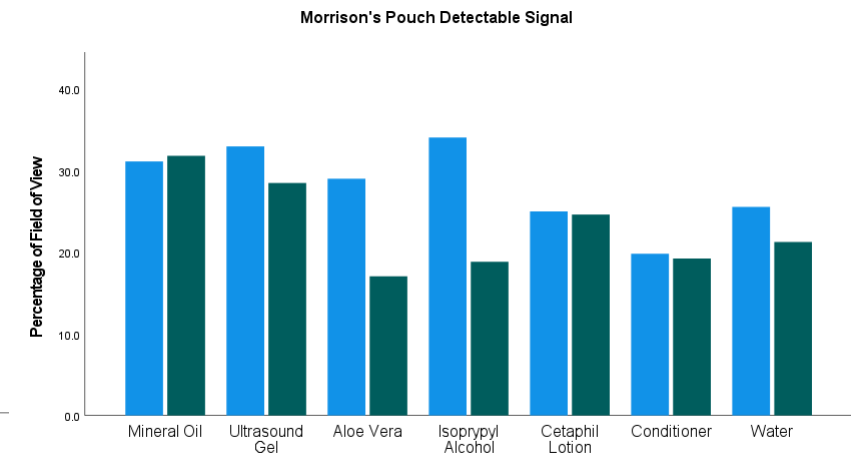
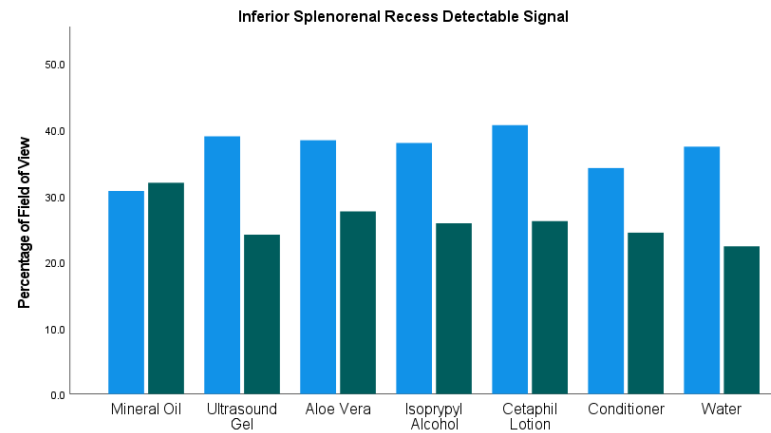
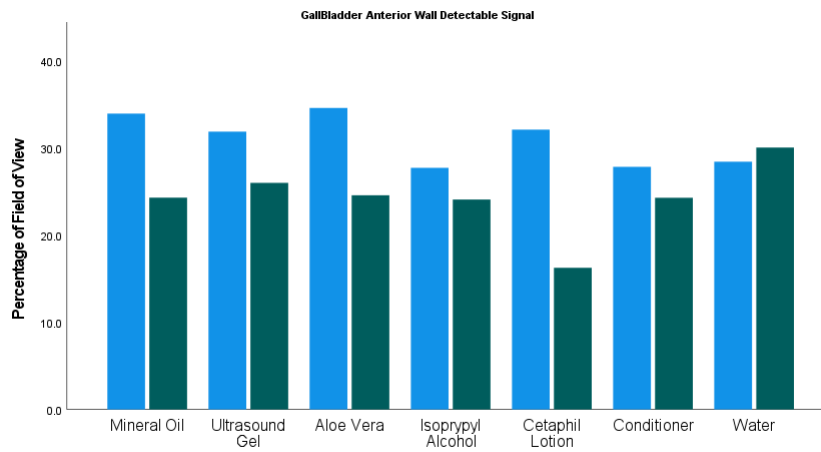
Pixel Intensity Quantification



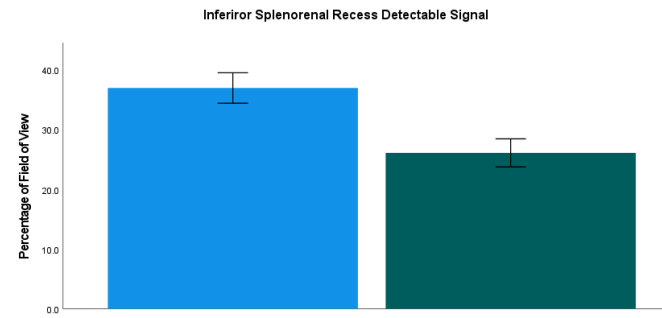


Result: Fellowship trained diagnostician showed significantly greater image quality as assessed by pixel density

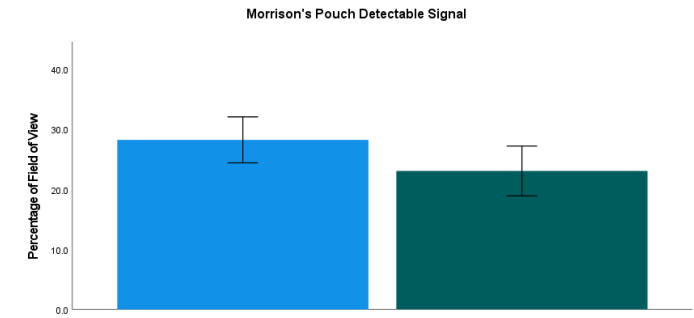
■ Fellow
■ Resident



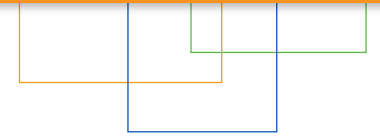
$p = .004$



$p < .001$

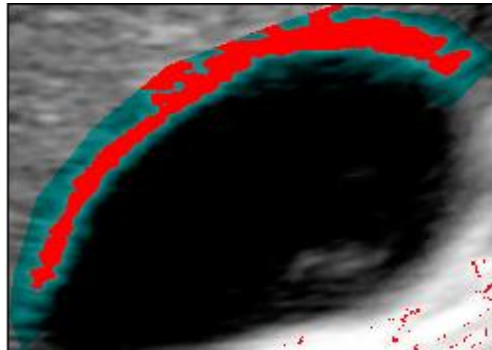
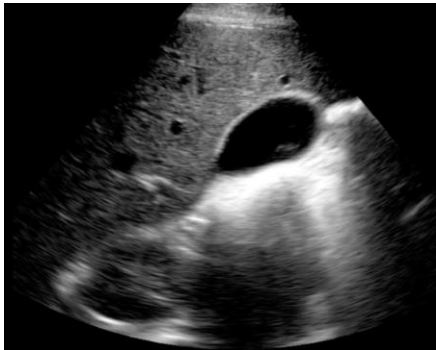


$p = .091$

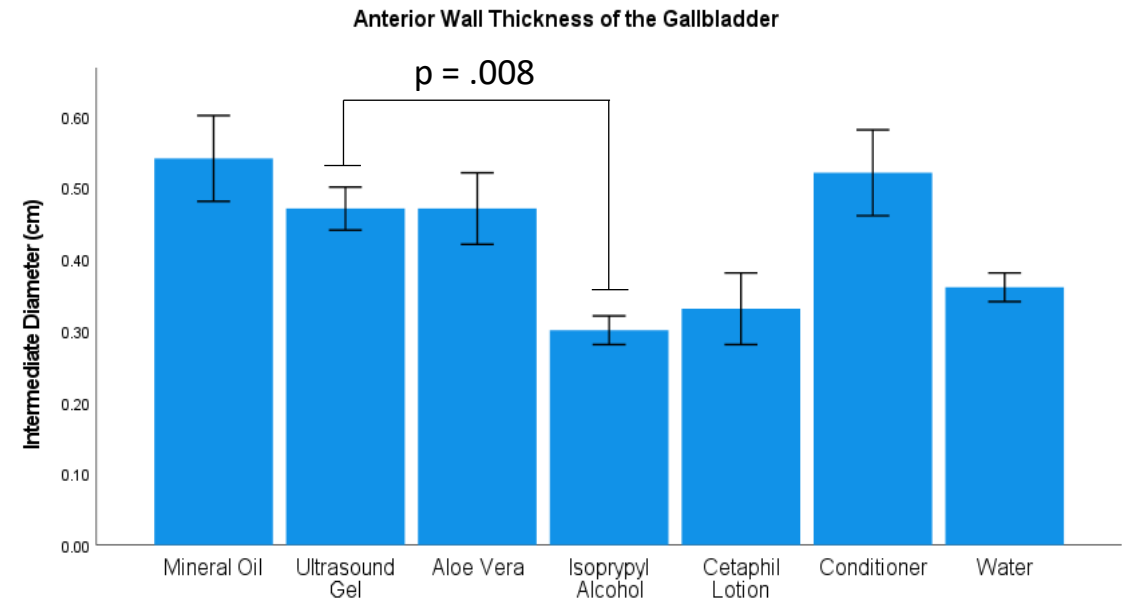
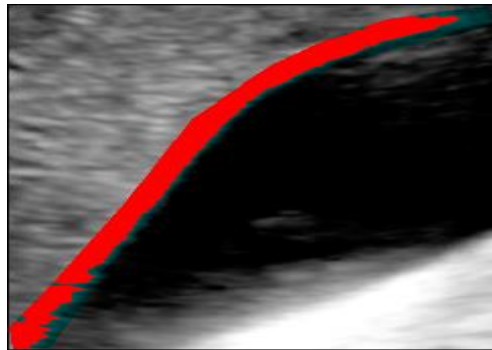
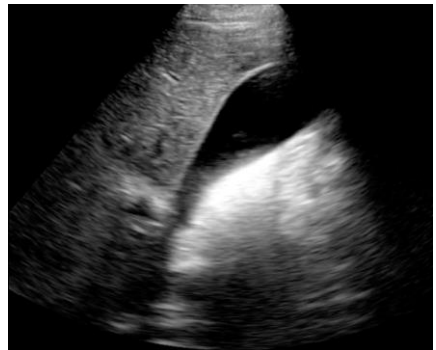


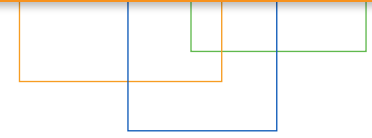
Result: Differences in Gel Analog Produced Anatomical Measures

Aquasonic Ultrasound Gel



Isopropyl Alcohol





Conclusion

1. **No significant difference** in the quality of image produced between ultrasound gel media and many common household alternatives
2. **Fellowship trained** diagnosticians regularly produces scans of **higher quality** than an individual lacking dedicated training
3. The use of image analysis software for determining the diagnostic accuracy of novel ultrasound technologies should be further explored





Scientific Assembly

B O S T O N

2 0 2 1