Background
Point of care ultrasound (PoCUS) has become standard of care in many clinical settings; including the Extended Focused Assessment with Sonography in Trauma (E-FAST) in the management of trauma cases. Similarly, simulation is increasingly used in medical and trauma education. We wished to examine the diagnostic utility of the addition of a locally constructed low cost ultrasound simulator (using the edus2 system) to standard trauma simulations performed by residents.

Methods
Twelve residents with prior ultrasound training and orientation to our two simulators (SimMan 3G and edus2 ultrasound simulator), were each assessed on six different trauma simulations. For each scenario the participant initially performed a standard clinical assessment utilizing the SimMan 3G mannequin simulator, compiling a differential diagnosis, including confidence scores. They then performed an E-FAST scan using the edus2 ultrasound simulator and subsequently adjusted their list of diagnoses accordingly. A total of 72 scenarios were completed. We examined the effect of addition of simulated ultrasound on diagnostic accuracy, diagnostic confidence and diagnostic precision. Data was analyzed using standard techniques (Fishers exact and student t tests) with Prism (v6, GraphPad Software Inc.).

Results
Diagnostic accuracy improved considerably with simulated PoCUS using edus2. With the addition of PoCUS participants had 64 correct primary diagnoses (89% accuracy), as opposed to 32 correct primary diagnoses (44% accuracy) without PoCUS (p<0.0001; paired t test). Confidence in diagnosis improved from a mean of 47.6% (95% CI 39.9% - 55.3%) without the ultrasound simulator to a mean of 83.6% (95% CI 78.1% - 89.1%) with ultrasound use (p<0.0001).

Conclusion
The use of a low cost ultrasound simulator is a convenient way of supplementing training in both trauma and ultrasound.

By incorporating PoCUS simulation into trauma simulations, participants are significantly more likely to arrive at the correct diagnosis, have more confidence in their conclusions and also have a narrowed differential diagnosis.