Context/Setting:
We have developed an educational module using a web-based curriculum and spinal haptic (touch based) simulator for medical students, allied health providers and residents to learn spinal needle insertion. Following simulator training, performance of spinal needle insertion on a patient is measured by a checklist of activities\(^1\), duration of procedure and return of cerebrospinal fluid through the hub of the needle.

Need:
Currently, trainees learn spinal needle placement via observation, background reading, examining models, and performing this procedure on patients. With current training, it takes more than forty attempts to achieve 90% success\(^2\). A simulator combining haptics with a web-based curriculum that immerses trainees in a virtual environment may facilitate a better understanding of anatomy and procedural steps and accelerate attainment of proficiency.

Action:
The web-based curriculum is an interactive tutorial containing text that describes the procedure and multimedia links within the text that further elucidates different steps. The haptic component is a robotic arm (Fig 1) that simulates the sensations of resistance and touch to interact with an animated 3D replication of the lumbar spine.

Impact:
This educational module may speed the attainment of a satisfactory successful needle placement rate while reducing learner anxiety and improving patient safety.

References:

**Figures:**

**Fig 1.** Haptic Simulator using a *Phantom* Robotic arm interacting with computer generated 3D anatomy