 UT Southwestern’s Center for Minimally Invasive Surgery Simulation and Training Lab provides realistic experiences for medical students. Currently, existing seizure simulations are largely underwhelming and unrealistic.

### Seizure System
- 2 Linear pneumatic actuators provide 2 modes of movement
- Seizure and defibrillation
- Electro-pneumatic solenoids allow the pneumatic actuators to be controlled electronically using a microcontroller
- Powered by standard 120V wall supply
- 8020 Framing allows the actuators’ plates to move inward/outward to maintain stability with various medical mannequins
- Blocks mounted to top of actuators provide more lift and protect the mannequin
- Acrylic side panels and aluminum top panels
- Neoprene covering the top panel

### Handheld Controller
- On/Off switch to control system power
- Toggle switch to engage desired mode of movement
- Speed dial to vary the seizure speed
- Push button to engage shock response (defibrillation)

### Design Overview
- Device must be fully concealed within the mattress
- No wireless connections
- 10 year lifespan
- Waterproof on top and sides of system
- Must be able to operate with various medical mannequins
- Nothing fixed to the mannequin
- Operate at 50 psi
- Minimize system noise
- Ability to vary seizure speed
- Have a second mode of movement — defibrillation response
- No batteries

### Conclusion
While in an observation room, separate from the simulation room, the instructor will have the ability to control when the seizure begins and ends, the speed of the seizure and the frequency of the shock response. By concealing the system in the mattress, the students will observe the mannequin “seizing” without any obvious external components. This system will provide a more realistic seizure simulation to better train students to be prepared to care for future seizure patients.

### Future
UTSW will obtain a patent on the design and commercialize the system to provide to other medical schools at a reasonable cost.

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