

# Research Device to Measure Suture Tension During Syndesmotic Injury Repairs



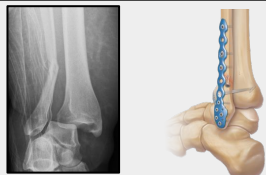
DREXEL UNIVERSITY  
School of  
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## SDT 16

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### 1) NEED:

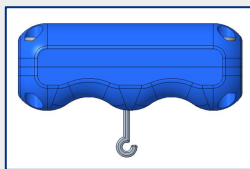
- 1) 187 ankle fractures per 100,000 people
- 2) Cannot currently measure suture tension during syndesmotic repair surgery



### 2) DESIGN INPUTS:

- 1) Measures 20 - 125N of applied tension
- 2) Compatible with current suture solution
- 3) Optimal for surgical space: 128mm x 50mm x 48mm

#### Bluetooth Integrated Handle

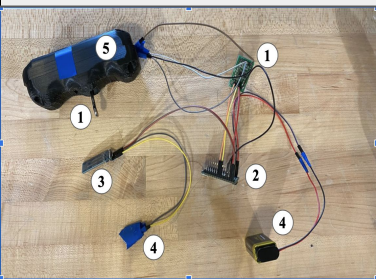


Enables real-time force measurement and data visualization

### 3) BUILD:

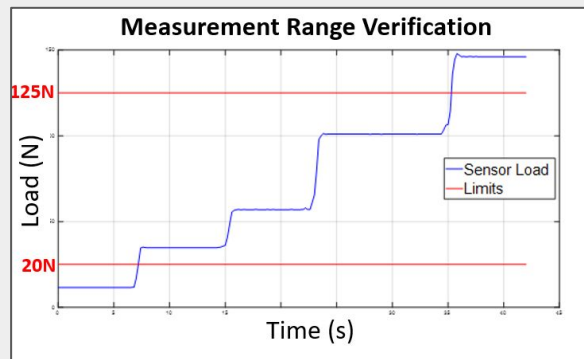
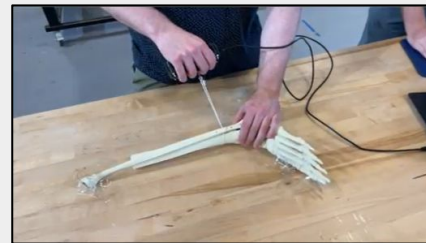
#### Current Build

- 1) Tension Load Cell/Amplifier: Force Input
- 2) Arduino Nano: Data Processing
- 3) Bluetooth Transceiver: Communication
- 4) Batteries: Power Supply
- 5) Handle: Grip



### 4) TESTING RESULTS:

Results prove device can measure suture tension within required range



$Tension_{suture} < max$  ✓

$Tension_{suture} > min$  ✓

### 5) FUTURE:

**User Impact:** Correctly quantify tension applied during surgery  
**Societal Impact:** Research tool to guide clinical decision-making resulting in better patient outcomes