

# NeoTap

GUIDANCE SYSTEM TO ASSIST WITH  
NEONATAL LUMBAR PUNCTURES

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# BACKGROUND

Neonatal Lumbar Punctures are used to diagnose various neurological conditions  
Cerebrospinal Fluid is extracted with a needle from the Lower Lumbar Region (L3 - L5)  
Requirements to perform Neonatal LP's have become more stringent in recent years

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The current Standard of Care is using simple palpation using anatomical landmarks  
This approach is inaccurate and often needs repeated attempts, resulting in failed procedures

# PROBLEM DEFINITION

<b>Lumbar Punctures</b>	<b>Current Approach</b>	<b>Disadvantages</b>	<b>Unsuccessful Procedures</b>	<b>Existing Solutions</b>
<p>Performed for neonates with unexplained fevers</p> <p>Testing for infections/injuries</p>	<p>Anatomical Landmarks</p>	<p>Low Success Rate</p> <p>Limited Training Opportunities</p> <p>Inaccurate Landmarks</p>	<p>Swelling &amp; Bleeding</p> <p>Subsequent attempt more difficult</p> <p>No CSF collected at all</p>	<p>Ultrasound Guided Needle Insertion:</p> <p>Expensive &amp; Bulky</p> <p>Multiple trained operators required</p>

# GOALS



**Affordable**



**Portable**



**User-Friendly**

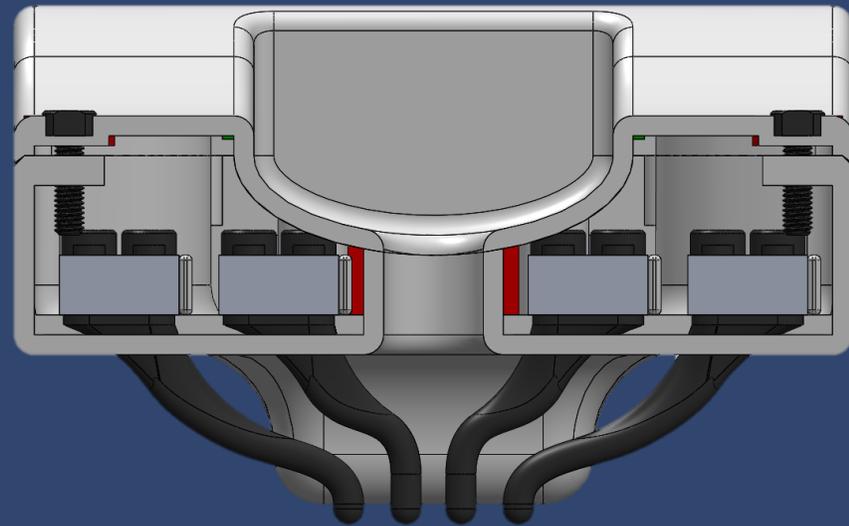
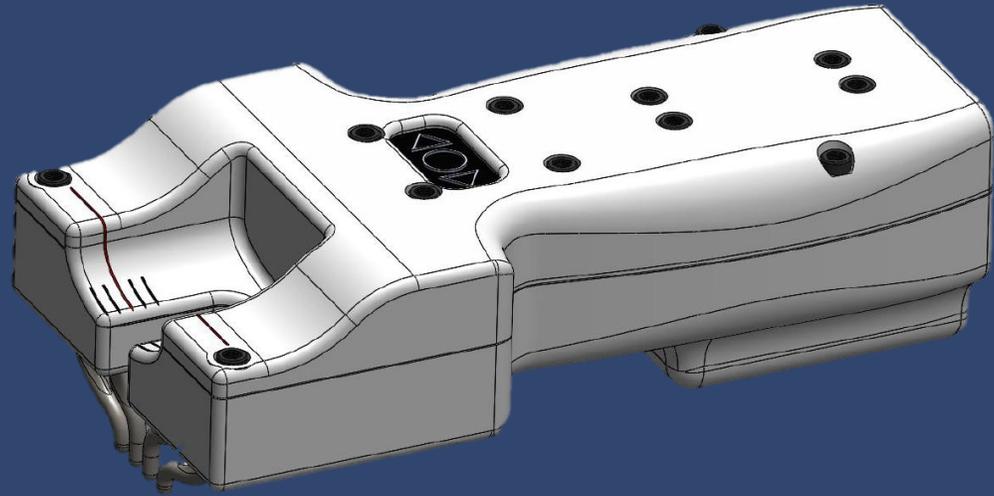


**Improved Accuracy**

## DESIGN

Four in-line probes  
measure independent  
force values

Value are compared to  
guide user to best  
insertion point



# BENEFITS

- Cost-Effective
  - *Ultrasound Machine*                      \$15K - \$35K
  - *NeoTap Device*                              Under \$1000
- Accessible parts
  - *Easy maintenance and repairability*
- No specialized training required
- Small form factor



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