Functional Seating Design for lumbar puncture procedure, Team CHAIR
Client: Cynthia M. Carlsson, MD, MS
Team Members: Linstroth (Leader), Soundarrajan (Comm's)
Feest (BWIG), Wanta (BSAC)
November 6 to November 9, 2006

Problem Statement

Design a specialized chair to use for lumbar puncture procedures in the sitting position. Proper positioning of the person to open up the space between the lumbar backbones is critical for success of the procedure. Keeping the patient comfortable while maximizing the curve of the low back to optimize the access to the lumbar interspace is important, yet remains a difficult challenge using current positioning techniques. Currently, we are lacking proper seating equipment to optimize the position and comfort of the patient during the procedure. The need for this chair is critical as currently our seating is suboptimal, there is nothing commercially available at this time, and the use of the lumbar puncture technique in research is becoming increasingly more scientifically significant.

Last Week’s Goals

• Discuss three design alternatives

Summary of Accomplishments

• Approved ordering of desk top massage chair for head rest and arm rest components.
• Ordered Desk top massage chair.
• Researched possible foot rests
• Shop permit approved

Design 1

Description:

• Arm rest, Head rest, foot rest are all connected to a central bar, and are all adjustable.

Pros:

• Easy to keep track of all components because it is one unit.

Cons:

• May be larger than alternative designs
• May be difficult to transport due to its size
• May be difficult to construct

Design 2

Description:

• Arm rest and head rest is one unit and clamp to the desk in the examination room. Foot rest is a separate unit.

Pros:

• May be easier to construct
May be more stable than alternative designs.

Cons:

- Parts may become separated or lost.
- May not be compatible with all hospital room tables.

**Design 3**

Description:

- Arm rest and head rest compose one unit while foot rest is separate.

Pros:

- Easier to construct than Design 1.

Cons:

- Pieces may become separated and lost.

**This Week’s Goals**

Order a foot rest  
Search for additional components: Hardware store, Home Depot

**Project Difficulties**

Difficult to find inexpensive footrests

**Teams Hours for the week**

<table>
<thead>
<tr>
<th>Name</th>
<th>Hours</th>
<th>Task</th>
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<tbody>
<tr>
<td>Lee</td>
<td>1</td>
<td>Researching and ordering components</td>
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Form Team, choose project, email team member info to advisor
Background Research
Brainstorm
Develop Design Alternatives
Work on Powerpoint
Choose final Design
Work on Final Design
Work on final presentation
Final meeting with advisor
Update Website