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)
October 6 to October 12, 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
• Began solid works drawings on three designs
• Began power point presentation
• Met with client 10/6/06 to discuss design options.
• Took measurements of room/bed for design limitations.

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**

- Finish solid works drawings
- Finish powerpoint presentations
- Research Materials

**Project Difficulties**

None to report at this time.

**Activities**

None to report at this time.

**Teams Hours for the week**

<table>
<thead>
<tr>
<th>Team</th>
<th>Hours</th>
<th>Activities</th>
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<tbody>
<tr>
<td>Lee</td>
<td>2</td>
<td>Updating progress report, Team meeting to begin design drawings and powerpoint.</td>
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<tr>
<td>Amanda</td>
<td>2</td>
<td>Team meeting, individual research.</td>
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<td>Chelsea</td>
<td>2</td>
<td>Team meeting, individual research</td>
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<td>Malini</td>
<td>2</td>
<td>Team meeting, individual research</td>
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<tr>
<td>Task</td>
<td>September</td>
<td>October</td>
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<tr>
<td>Form Team, choose project, email team member info to advisor</td>
<td>8</td>
<td>15</td>
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<tr>
<td>Background Research</td>
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<td>6</td>
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<tr>
<td>Brainstorm</td>
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<tr>
<td>Develop Design Alternatives</td>
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<tr>
<td>Work on Powerpoint</td>
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<td>Choose final Design</td>
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<td>Work on Final Design</td>
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<td>Work on final presentation</td>
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<td>Final meeting with advisor</td>
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