Device for Maxillomandibular Fixation Following Facial Fractures

Week – November 18 – November 24

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Team Members: Ashley Phillips – Co Team Leader
Nina Lewis – Co Team Leader
Joe Ferris – Communications
Sara Karle – BWIG
Emily Maslonkowski – BSAC

Problem Statement
Currently, the most common technique of fixing the jaw after a facial fracture is called maxillomandibular fixation (MMF), which requires wiring the mouth shut with the use of arch bars and wires. It has been proposed to us to design a device which will mimic the function of MMF, but be easier and faster to apply while maintaining an adequate cost of application. Our design needs to securely hold the lower jaw tight to the upper jaw, but also needs to have an emergency quick release system. The device should also be safe for the patient during application and for the 4-6 weeks of healing.

Last Week’s Goals
- Obtain an adhesive in order to test it on wet surfaces and on our bracket design
- Split up the final report
- Meet with a professor to figure out how exactly to analyze the forces in the elastics
Accomplishments

- Joe ordered the brackets and looked into the quick release (more expensive) brackets; Joe also added information about the new brackets into design #3 of our final report
- Emily wrote a draft e-mail to send to Dr. Warner to send out to 3M and other companies we were interested in obtaining adhesive from; She also e-mailed some of the companies that have the adhesive of interest to us
- Sara fixed the problems from our mid-semester report in the problems and possible resolutions section and also added more information to future work about the biomimetic behavior of the muscle (acting as an adhesive)
- Nina and Ashley met with Prof. Tyler and figured out how to determine the best configuration for the elastics and how to approximate the opening force of the jaw
- Ashley fixed the grammatical errors in the paper
- Nina added the internal citations to the paper and is purchasing an adhesive similar to the one we will be using, to glue the brackets to our model skull; Nina also did the calculations for the force of the elastics and the opening force of the jaw (based off of the information from Prof. Tyler)

This Week’s Goals

- Put bracket design on the model skull
- Compile the final report
- Work on the power point slides for our final presentation
- Practice our final presentation

Difficulties

- We would like to find a more cost effective way to use the braces design, since this is the only con to this design
- If the arch bars were to be used we need to figure out a method in which to connect them laterally as well as add texture to the back in order to create a stronger bond for the adhesive
## Activities/Accomplishments

<table>
<thead>
<tr>
<th>Group Member</th>
<th>Weekly Accomplishments</th>
<th>Time (hrs)</th>
<th>Running Total (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashley Phillips</td>
<td>Class time; final paper revisions; progress report; meeting w/Prof. Tyler</td>
<td>4.0</td>
<td>50.5</td>
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<tr>
<td>Nina Lewis</td>
<td>Class time; Individual research on the forces in the elastics &amp; in the jaw; progress report; meeting w/Prof. Tyler; obtained adhesive; final paper revisions</td>
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<td>51.5</td>
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<tr>
<td>Sara Karle</td>
<td>Class time; final report revisions</td>
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<tr>
<td>Emily Maslonkowski</td>
<td>Class time; final report revisions; wrote the draft e-mail</td>
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<td>48.5</td>
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<tr>
<td>Joe Ferris</td>
<td>Class time; obtained brackets; final report revisions</td>
<td>3.0</td>
<td>47.0</td>
</tr>
</tbody>
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