Patient Positioning Aid

Week #3
February 7th, 2006
Andrew Harris

Work Completed:

This past week was very successful for through intense brainstorming and research we were able to overcome most of the hurdles that were holding us up. Our first major problem was the apparent flexion in the PVC transfer board, and this week we were finally able to receive a formal quote from ModernPlastics for the PVC stock which we will need to create the transfer board supports. We just received the quote this weekend so we will have to wait until this upcoming Friday to order the parts. However we created new Microsoft Visio drawings that depict the measurements and placement of the supports on the transfer board; thus allowing us to work on other components of the design without interfering in the PVC support area. I also spent more time looking up different grips for the handbar and should be receiving various email quotes. Once we cut and piece together the handbar we will then make a decision on which types of grips that will be best to use. Another major problem that we solved this week was the necessary new design of the arm stabilizers. Last week we discovered that our current arm stabilizer design would not give sufficient support, and we were also having trouble figuring out a way to lock the stabilizers in place. This week we came up with a new design which utilizes an aluminum track system with linear motion made by 80/20. We also decided to change the leg stabilizer design to utilize similar 80/20 technology; the following are two images of the new leg stabilizer design:
The new leg stabilizer design also uses the 80/20 aluminum track system with linear motion. In using the 80/20 system for the arm and leg stabilizers those components will now have linear sliding motion and will be able to be locked-in at various positions greatly increasing the versatility of the design. On Friday our whole group went and met with professor Qing Zhu and asked for her insight on this new design. Professor Zhu is a specialist in imaging technologies and she assured us that this aluminum would not interfere with the CT and MRI scanners and the images that they would take.

Also on Friday Bhavin and I marked the PVC rod to be cut into the different parts of the handbar in the machine shop. On Monday Bhavin took the marked PVC rod into the machine shop and cut it into the handbar pieces which are depicted in the following digital images:
Future Work:

The first task is for us to finalize the purchase order for the PVC supports that we will be attaching to the sides and bottom of the transfer board. The next important task is for us to finish our search of all of the hardware. We need to find suitable screws to attach the PVC supports to the PVC transfer board, as well as suitable bolts to use to attach the 80/20 components to the transfer board. The 80/20 components come with their own hardware, however they are made of steel which we cannot use in our design therefore other hardware is needed. Christen has led the search on this hardware and we have looked at hardware made of various materials such as nylon and silicon bronze. We also have to finalize our order on the elevator and carriage bolts that we are going to use to attach the arm and leg stabilizer bases to the transfer board. We have already received multiple quotes from different companies on this hardware, and we just have to decide on which ones to use.

Project Review:

As mentioned before this was a very successful week as far as in the problem solving that was accomplished, therefore overall the project is going very well. The new designs for the components of the arm and leg stabilizers will greatly improve the versatility and effectiveness of the whole design. Another good thing to mention is the fact that our group continues to work very well and effectively together. Every member of our group contributes his/her fair share and when we have team meetings in lab each member has research and new ideas to share.

Hours Worked:

In Lab – 6 hours
Outside Lab – 2 hours