

**Project:**  
**Magnetic Resonance Imaging Compatible Infusion Pump**

**Team Members:**

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**Client:**

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**Date:** 2-25-04 thru 3-2-04

**Problem Statement:** MRI compatible infusion pump for gadolinium and saline solutions has pumps that are syringe driven but limited in their sequence capability and in the amount each can hold. The client wants two new pumps that are programmable and can effectively control the infusion rates of gadolinium and saline independently without having to refill the syringes. New pumps will not only save client's time, but it will also save money since refilling the syringes wastes a lot of gadolinium.

**Restatement of Team Goals from Last Week:**

1. We will start working on the Power Point now that we have decided on three possible designs: spur gear, vane pump and peristaltic pump.
2. We will continue to search for information relating to pumps that can either help us understand the pump mechanism better or help us find companies that sell parts for hydraulic pumps.
3. We will meet with Dr. Tompkins next week to figure out how we will program the pump so it can deliver fluids at various flow rates.
4. If Prakash is unable to get a hold of Dr. Block Wednesday (last week), we will set up an appointment with him.

## **Summary of Accomplishments:**

1. We are done with our assigned slides. Miguel, Prakash and Can finished the design slides. Aman finished the evaluation of three chosen designs and did the introductory slides.
2. We have also been searching for companies, parts and motors. We have found well over 15 companies that sell the pumps of our choice. The only problem is that we have not been able find a company that sells pumps and the motor at a reasonable price. Most of the brand new pumps are around \$200; however, this price does not include the size of pump. For our design, the pump will be relatively small compared to the ones shown on company websites. Therefore, we expect our chosen design pumps to cost less \$200. We have also been able to find used pumps on e-bay that cost less than \$100. We also looked into motors, which will drive our pumps. The best motor that we found for our purpose is the stepping motor. We have not yet found the price for the motor that will be compatible with each of our designs.
3. Aman was able to meet with Dr. Tompkins on Monday with whom he talked about different devices that can be used to program a motor. Dr. Tompkins suggested that our group should use C-Language to program the motor. He also suggested talking to a senior undergraduate student, Nick Vandehey who knows how to program using a special kit.
4. Prakash was unable to meet with Dr. Block last week. However, he is meeting him on Wednesday to talk about shielding metallic materials.

## **Individual Goals:**

1. Aman Ghotra: Finish Progress Report 6; Email my slides to Prakash; start the paper
2. Can Pi: Email slides to Prakash; Research; help with the paper
3. Prakash Rao: Put the Power point together; Update the website; help writing the paper
4. Miguel Benson: Attend BSAC; Email slides to Prakash; help with the paper

## **Statement of Team Goals:**

1. We all have to email our slides to Prakash by 8 PM tonight. Prakash will then put all the slides together and modify any slides that need changes.
2. Prakash will meet Dr. Block on Wednesday to talk about the shielding and protecting the motor from MRI.
3. Miguel will meet Frank, the technician to ask a set of questions we all came up with on Sunday. He will inform us back. We may make some changes in our power point depending on what Frank has to say.
4. Aman will start the mid-semester paper and everyone will else help doing certain parts of it.
5. Set up an appointment with Nick to ask him if we can show us the programming kit.

**Rough Project Schedule:**

1/23/04: Made teams and assigned roles  
1/29/04: Meet our client  
1/30/04: Develop PDS  
2/13/04: Brainstorm possible designs  
2/24/04: Sketch out the three designs  
2/27/04: Evaluate Ideas and work on power point  
3/05/04: Mid-Semester Presentation  
3/05/04: Choose final design  
3/05/04 – 4/23/04: Work on final design  
4/23/04: Work on final power point, final paper and PDS  
4/30/04: Poster Presentation

**Difficulties:** None.

**Activities:**

Aman Ghotra: Progress Report 6; Research; Group meeting; met Dr. Tompkins (8.0 hours)  
Can Pi: Research; Group meeting (6.5 hours)  
Prakash Rao: Research; Updated the Website; Group meeting (7.0 hours)  
Miguel Benson: Group meeting; Research (6.5 hours)

**Running Total: 91.0 Hours**

Aman Ghotra: 26.0 hours  
Can Pi: 22.5 hours  
Prakash Rao: 24.0 hours  
Miguel Benson: 18.5 hours