

Heated Diagnostic Radiology Examination Table

Week 11 – April 3rd to April 10th, 2009

Team Members:

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Problem Statement

A frequent patient complaint is that current x-ray tables are hard and cold. A pad can be used to eliminate the first complaint; however the temperature of the table cannot be altered on standard tables. A heated exam table or attachment that has a temperature control to give patients added comfort during exams, needs to be developed. The materials used need to be radiolucent and may not obscure the body part being imaged. A mechanism must be implemented that eliminates the possibility of patient injury such as burn.

Last Week's Team Goals

- i. Retest tubing and padding for radiolucency with phantom and make adjustments to design as needed.
- ii. Develop a procedure for testing heating characteristics.
- iii. Test heat characteristics proposed heating unit, tubing, and padding.
- iv. Develop circuitry for control of heating unit.
- v. Finalize pump requirements, and order pump.
- vi. Order other necessary parts and begin assembling prototype.

Summary of Accomplishments

- i. Joel has contacted Dr. John Vetter to schedule a time for us to retest our materials with a phantom. We are still waiting to hear back from Dr. Vetter. To make most efficient use of time we have decided to focus on our heating and pumping units while waiting to test the radiolucency of tubing materials.
- ii. Joel and Paul tested the heat transfer of the tubing/padding sample and found the necessary temperature of tubing liquid to provide comfortable heat.
- iii. As a team we met to build and test the functionality of our heating unit. Our heating unit is composed of the “Roof De-Icer” heating element wrapped around a piece of ½ inch copper pipe cut to length. In line with the power supply for this heating element is an AC dimmer control for household appliances. With the dimmer control we were able to vary the temperature of the heating unit. Our calculations show that our heating element should provide well above the minimum required amount of heat. We will use trial and error to find the appropriate comfortable temperature once the prototype is complete. It has been decided to update the heating unit to have feedback control only once the rest of the prototype is developed.
- iv. Paul and Tyler purchased and constructed the tubing system of the prototype. Pipes and tubing were cut to length and assembled according to our design. The tubing to be laid within the pad has been left unattached in the event that PEP is not radiolucent. Also if left unattached implementation with padding may be simplified.
- v. Joey has been working to determine the required specifications of our pumping unit. Specifically, he has looked into the power required. With this knowledge we will be able to quickly order the proper pump for our device once the tubing layout is finally established.
- vi. Paul attended a workshop seminar that will be helpful when placing the tubing within the padding.
- vii. All team members have submitted applications and are in the process of acquiring a student shop pass. This will allow us the opportunity to use the student shop in the development of our prototype.
- viii. The use of PMMA has been considered in the event that the currently selected materials fail the second round of testing.

This Week's Goals

- i. Retest tubing and padding for radiolucency with phantom and make adjustments to design as needed.
- ii. Develop a procedure for testing heating characteristics.
- iii. Test heat characteristics proposed heating unit, tubing, and padding.
- iv. Finalize pump requirements, and order pump.
- v. Order other necessary parts and begin assembling prototype.

Project Difficulties

N/A

Activities

4.3.2009	Team: Meeting to construct and test heating unit.	3 hours
4.5.2009	Joey: Determination of required pump specifications.	1 hour
4.3.2009	Joel: Testing of pad/tubing heat transfer.	.5 hours
4.3.2009	Paul: Testing of pad/tubing heat transfer.	.5 hours
4.9.2009	Paul: Construction of tubing system w/heating element.	2.5 hours
4.9.2009	Paul: Attended workshop seminar.	1 hour
4.9.2009	Paul: Updated website.	.5 hours
4.9.2009	Tyler: Work on radiolucency testing procedure.	1 hours
4.9.2009	Tyler: Construction of tubing system w/heating element	2.5 hours
4.9.2009	Tyler: Wrote progress report.	.5 hours

