

Umbilical Cord Model for Umbilical Vein Catheterization Training (Umbilical Team)

Clients:

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Friday, September 14 to Thursday, September 20, 2007

Initial Problem Statement:

The American Academy of Pediatrics Neonatal Resuscitation Program (NRP) is required training for thousands of physicians and medical staff who attend the delivery of newborns. Placement of an intravenous catheter in the umbilical vein of the cord stump in a distressed newborn is one way to provide life saving medication and is a skill that is essential to the NRP course. Hands-on training in the placement of an umbilical venous catheter has received increased attention and emphasis since the 2005 update of the NRP course. Currently, two models for hands-on training are available. Some companies make newborn models for CPR that also have artificial umbilical cords (ex Laerdol). These models appear to inadequately mimic placement in a real cord and are very expensive. Alternatively, the American Academy of Pediatrics recommends using sections of an umbilical cord obtained after delivery. The cord section is placed in a glass baby bottle with part of the nipple cut off so the cord extends about 1/2 an inch from the top of the nipple. While this model has the advantage of using a real cord, the cord is secured poorly and thus does not adequately mimic placement in a newborn. My design idea is to make a support for real umbilical cords that would more closely mimic the umbilical stump of a newborn. The model could be made out of a material that might mimic the abdominal wall, such as ballistic grade gel, and might perhaps have two halves that clamp around a section of real cord. The model could mimic the curves of the umbilical vein after it enters the body, making placement more realistic. Ultimately, this model, which would best be quite inexpensive and disposable, could be marketed to the over 25,000 individuals in the US who teach NRP and would likely represent a vast improvement over the "baby bottle" model.

Last Week's Goals:

- Acquire group assignments and roles as Leader, Communicator, BSAC and BWIG
- Literature Search:
 - Ann - existing artificial umbilical cords and their applications
 - Padraic - existing products related to catheterization
 - Kelvin - anatomy and tissue properties of umbilical cord
 - Angwei - current practices for catheterization training
 - Tim - procedures in catheterization

- Meet with Professor Ogle
- Meet with the Dr. Kessel

Summary of Accomplishments:

- Positions were chosen as seen at the top of this progress report.
- At our team meetings we have discussed our preliminary research, but are waiting till after the client meeting to start working on the PDS.
- Client Meeting: Friday, September 21, 2007 at 1:30 PM, in Dr. Kessel's office at Meriter Hospital.

This Week's Goals:

- Create a PDS
- Obtain this article: Umbilical Catheters: Risk; *Pediatr. Rev.* 1983;4;278-302
- **Training to be completed by September 28, 2007**
 UW IRB Human Subjects Training (start at Module 1)
<http://info.gradsch.wisc.edu/research/compliance/humansubjects/tutorial/index.htm>

 HIPPA Training (you must register at this site)
<http://ptehipaa.doit.wisc.edu/moodle/login/index.php>

 Meriter Hospital Human Subjects Training (scroll down to bottom the page where it says How)
<http://www.meriter.com/mhs/hospital/trials/training.htm>

 UW-Madison Blood Borne Pathogens Training (start at introduction)
<http://www2.fpm.wisc.edu/bbp/index2.htm>

Difficulties: There have been no difficulties to date.

Activities:

Ann Sagstetter: Team Meetings - 1.5 hours
 Literature Research - 2 hours
 Progress Report - 1 hour
Total: 4.5 hours

Padriac Casserly: Team Meetings - 1.5 hours
 Literature Research - 2 hours
 Finance/Activities- .5 hour
Total: 4 hours

Songyu Ng: Team Meetings - 1.5 hours
 Scheduling & Communications - 0.75 hours
 Literature Research - 4 hours
Total: 6.25 hours

Angwei Law: Team Meetings - 1.5 hours
 BSAC Meeting - 1 hour
 Literature Research - 2 hours
Total: 4.5 hours

Tim Baglemann: Team Meetings - 1.5 hours
 Literature Research – 2.5 hours
Total: 4 hours

Projected Time Line:

September 21: Form teams

Select project

Meet with client

Literature Search

September 28: Finish required tissue training modules

Write PDS

Post preliminary PDS on web site

Start Brainstorming

October 5: Brainstorm

October 12: Work out possible designs

Prepare oral presentation

October 19: Oral Presentation

Put PowerPoint presentation on team web site by 10:00 am

Hand in written report at time of presentation

October 26: Decide on final design

Commence prototype design

Start ordering materials

November 2-9: Designing process finish

Prototype construction beginning

November 16-30: Prototype construction

Begin final paper and poster preparations

December 7: Poster presentation

December 12: Written report due.

KEY: Green Highlight: Completed

Yellow Highlight: In progress

Blue Highlight: Goal for coming week