NICView: An Interactive Neonatal Case Simulator

Aperture Bioscience Laboratories

Jennifer Duan, Caitlin Li, Lindsey Sumners,
Pamela Wu, Amy Young
Sponsor: Maria Krakauer, M.D.

Problem Statement

- Because of new work hour limit restrictions on residents in the Neonatal Intensive Care Unit (NICU), they lack the thorough knowledge, efficiency, and procedural skills needed for quality NICU care.

Primary Objective

- To create a product that solves the problem of NICU resident inexperience in a convenient and effective manner.

Needs Assessment

- A safe and convenient method for residents in the NICU to practice procedures.
- A conceptual learning tool that accentuates the physical practice residents receive in the NICU.
- A practice tool that will expose residents to a large variety of cases.

Quantitative Measurements of Achievement

- Time to accomplish scenarios
- Comparative skill sets
- Pre- and post-tests
- Point System

Goals

- User-Software Interaction
  - Interactive
  - User-friendly
- User-Administrator
  - Feedback system
  - Consequence/Reward
- User-User Interaction
  - Forum
  - Recordable data

Background

- Current standard
  - Simulation Doll
- Pros
  - Volume
  - Variety
- Cons
  - Convenience to residents

http://www.kyforward.com/our-health/files/2013/07/doll.jpg

Benchmark for Measuring Care

	HOW IS THIS DOCTOR AT …	RATING SCALE Poor	Fair	Good	Very Good	Excellent Evaluate	Unable to
1.	Telling you everything; being truthful, upfront and frank; not keeping things from you that you should know	1	2	3	4	5	#
2.	Greeting you warmly; calling you by the name you prefer; being friendly, never crabby or rude	1	2	3	4	5	#
3.	Treating you like you're on the same level; never "talking down" to you or treating you like a child	1	2	3	4	5	#
4.	Letting you tell your story; listening carefully; asking thoughtful questions; not interrupting you while you're talking	1	2	3	4	5	#
5.	Showing interest in you as a person; not acting bored of ignoring what you have to say	1	2	3	4	5	#

Design Approach

- System and Environment
  - Will be played at home
  - Will be in 2D
- Performance Metrics
  - Point system
  - Timer
  - Quiz questions

Desired Outcomes

- Residents and medical school students should be able to use our program at home
- The NICU should see increased problem-solving competency and confidence in their residents
- Our program should be modifiable to add more scenarios as desired

Last Semester

- Decided on a game engine
- Initial scenario
- Visited a simulation session
  - How do residents think through scenarios
  - Flowchart model

Current Progress

- Graphics
  - Color and detail
  - Rest of medical instruments
- Flowcharts
  - Finished with all four flowcharts

Current Progress - Unity

- Color issue with objects resolved
- Button and text disappear when starting the scenario
- Developed code to determine when a game object is being clicked on
  - Research on Unity Physics Engine

CELA Meeting

- Tracking Longitudinal Events
  - They currently do not have any systems in place to measure progress in simulation
- Communication skills
  - Survey used to measure how they respond to patients
- Our quantitative measures
  - Time: Is there a decrease in time between key decision points?
  - This would be reflected in the point system of the game
  - Comparative skill sets also used to see improvement

Work Plan

- The month of February
  - Finish programming scenarios one and two
  - Receive an updated test scenario that correlates with scenario two from Dr. Krakauer
  - Finish designing and coloring all medical equipment
  - Observe a CELA training session