



Breast Cancer Examination Interactive Simulator

Grant Number: R44CA71300-03

Abbreviated Abstract

Multi Media plans to develop a Breast Cancer Physical Examination Instructional Simulator to teach physical breast examination techniques and lump detection discrimination to health care professionals and eventually to their patient populations. The system will consist of an interactive digital video program providing instruction on breast examination techniques integrated with an electronic silicone breast simulator for the practice of tactile skills. The instructional program will teach a comprehensive examination technique, including systematic search pattern, palpation topography, and pressure. The interactive simulator will provide practice and coaching feedback in tactile examination and lump detection skills. It will train and evaluate competence on breast examination technique and lump detection accuracy. In Phase I, Multi Media will produce instructional content scripts for the program and a working simulator prototype with one interactive segment for review by the Subject Matter Review Board for accuracy. Multi Media will test the prototype mechanisms for sensing user input and providing feedback. The prototype and instructional segment will be validated by two focus groups, health care professionals, and patient populations. Review findings will be incorporated into the final simulator prototype and interactive scripts. Phase II will include production of the interactive instructional program and simulator, informational brochure, and formal evaluation.

Primary Investigator

Richard L. Thorp, B.A.
Multi-Media Systems, Inc.
100 Radcliffe Drive
Chestertown, MD 21620
(410) 810-7506
Fax: (410) 810-7508
RLThorp@ilsbio.com

Richard Thorp is the President of Multi-Media Systems, Inc., a small high technology design and production organization, specializing in the development of advanced technology devices and educational systems to improve the prevention, diagnosis, and treatment of cancer, with a special emphasis on breast and cervical cancer. Multi-Media Systems produces and distributes its products under the trade names Multi-Media Productions, Multi-Media Software, and Medical-Informatics. Mr. Thorp is the former Chief of Learning Resources of the Department of Veterans Affairs. He has over 40 years experience in designing and producing mediated adult and medical education products.



Research Team & Affiliations

PI: Richard L. Thorp;

Instructional Design: Donald L. Cordes, Ph.D.; Experts: Henry Penneyacker, Ph.D., President Mammatech, Inc.; Software Interface – BearSoft, Inc.

Total Budget

\$866,363.00

Research Objectives

Aim 1: Develop Breast Examination Courseware

Aim 2: Develop Tacitly Correct Breast Models

Aim 3: Develop Computerized Teaching Simulator

Aim 4: Develop Certification Testing System

Theory/Hypothesis

A computerized teaching system can speed and enhance the accuracy of clinical breast examination training

Experimental Design

Comparison of proficiency using test set of breast models by students using simulator training vs those with standard classroom training.

Final Sample Size & Study Demographics

50 nursing and medical students and physician assistants

Data Collection Methods

Direct observation and outcome measures; written test.

Outcome Measures

Number and size of nodules detected. Test scores.

Evaluation Methods

Direct evaluation using silicone models and written examination.

Research Results

Students using the clinical breast simulator were consistently able to detect more lesions and smaller lesions than conceptually trained students.



Barriers & Solutions

5 different technologies were explored and prototype developed to be able to accurately detect the position of ant the pressures exerted by students on the clinical breast models. The student's finger positions elicited guidance and directions from the learning system. The linkage between the clinical models and the software required complex mathematical conversions and analog to digital interfaces. Ultimately a miniature version of the global satellite positioning (GPS) was developed.

Product(s) Developed from This Research

Clinical Breast Examination Teaching Simulator