

# BREAKAWAY ltd.

## MEDICAL TEACHING AND TRAINING PLATFORM



The use of BreakAway's game-based technology allows learners using the medical training platform to:

- Improve skills learning and retention;
- Provide in-depth clinical practice experience in a physiologically and emotionally realistic environment;
- Enable rapid introduction of new knowledge and information to deploy immediately in a medical training curriculum.

### < FROM THE FRONT LINES TO THE HOME FRONT >

This technology was developed to support an increasingly urgent teaching and training issue specific to the health care industry. A physician shortage on the horizon predicts a deficiency of 200,000 physicians by 2020. A nursing shortage already has vacancies exceeding 100,000 on any given day in the long-term care industry. Increasing medical needs incurred by an aging population with longer life expectancy will create shortages in the availability of chief resident and attending physicians who can devote time to train and supervise staff.

Preparation and training for health professionals is already a serious and costly issue. The Institute of Medicine reports 98,000 error-related deaths annually, costing as much as \$50 billion. At the same time, medical residents are restricted to 80-hour work weeks, meaning that the next generation of medical professionals is receiving less clinical practice experience than any before them.

The tools and models within this training platform can be deployed anywhere, providing an educational experience independent of full-time availability of a teaching professional. The educational framework supported by the platform as used in *Pulse!!* is designed for mastery learning through proficiency-based cognitive and experiential education strategies tied to the six core Accreditation Council for Graduate Medical Education competencies along with summative and formative evaluation. Within these easily authored learning environments, all types and levels of clinical learners can take initiative in assessing, diagnosing, and treating an infinite array of patients and diseases, mastering critical skill sets and procedures through repetitive practice.

BreakAway has created a set of tools and editors to enable the transformation of medical education curriculum into a fully immersive 3D teaching and learning environment. Created to support the *Pulse!!* Virtual Clinical Learning Lab developed in partnership with Texas A&M University – Corpus Christi, these tools and editors have the potential to be customized for other training programs – in medicine or in other fields.

Developed under a grant from the office of Naval Research (ONR), this technology creates a medical training platform to allow doctors deployed in the military to rapidly diagnose and treat patients in the field for new and unfamiliar injury patterns resulting from IED explosions and effects of protective gear such as Kevlar body armor, as well as identifying symptoms of bioterror events. The underlying tools behind this project will be the first in the mösbē training platform, currently in development.



This technology is currently being tested for its efficacy as a training tool at Yale Medical School, Johns Hopkins School of Medicine, and at Bethesda Naval Hospital. Results are expected in 2008.

### < TOOLS TO TRANSFORM LEARNING >

Game-based technology powers the training platform and enables customization and re-use for development of powerful training programs set in an immersive realistic environments --within medicine and in other fields in need of low-cost, easily deployable training tools and programs.

- **Visualization**  
The Visual Interface and Scaffolding for Total Acuity (VISTA) module encompasses the graphics rendering approach that provides visual fidelity and the CTC realization to the user as they interact with the learning system. A world builder in VISTA allows for the creation of interior environments and enables placement of objects and navigation of the space.
- **Physiology**  
The Simulation Engine for Patient Traits and Environmental Reaction (SEPTER) is actually the patient, which has an underlying physiology model that handles the simulation of the functioning human body. The patient is currently able to simulate pupil dilation and movement, breathing and heartbeat, bowel sounds, skin pallor, and visible signs of shock. Current development involves cases which are invasive to the patient and involve blood and organs.
- **Enhanced Artificial Intelligence**  
Appropriate patient reactions and responses to both diseases and to medical personnel are handled by the AI in the simulation. Non player character AI will be added to simulate the medical team's actions required to handle new cases and environments currently in development.



### < CURRICULA DEVELOPMENT TOOLS >

This set of tools enables educational organizations to create full curricula modules putting the teaching tools necessary to create custom learning environments in the hands of the curriculum developers.

- **Case Editor**  
Develop customizable teaching scenarios and deploy them in the learning modules of the platform.
- **Performance Evaluation Module**  
Track student performance during the execution of a case. Using subject matter expert task analysis and performance metrics as a guide, this module reviews a log of all actions performed in a case and makes an assessment as to whether the student is achieving the learning objectives designed for the case.
- **Distance Learning System**  
A distance learning infrastructure consisting of a Curriculum Server deployed via the Internet and a Pulse Platform network client to receive cases from the Curriculum Server will be enabled to allow a professor to designate a series of acases that must be successfully completed to satisfy the curriculum. Once a case has been completed, the Platform will send the results of the student's performance back up to the Curriculum Server for evaluation of student progress
- **Team Training Module**  
This module will enable multiple users to interact within a case environment in the treatment of a patient.



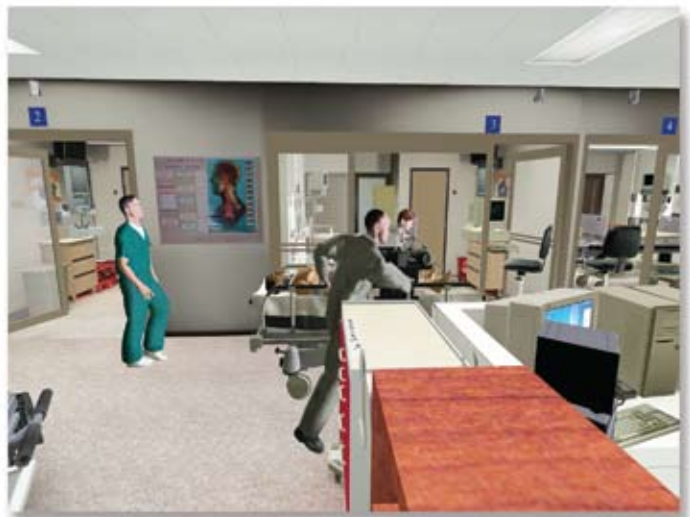
# A model FOR THE mōsbē PLATFORM

The underlying tools and components developed by BreakAway have powerful capabilities for enabling any kind of individual and team-based training that involves interpersonal interaction and hands-on skills learning and testing. While medical training beyond the military or the classroom is the most obvious next step for these tools, the capability exists to incorporate them into the training protocols for a wide array of industries.

BreakAway has a vision for further developing these components into a new set of tools and models to merge with the mōsbē product line, creating a first-person set of tools for creating custom training simulations that can integrate with the worlds, scenarios, and strategic and operational concepts created within the current set of mōsbē products and models.

If your organization is seeking a training transformation, contact BreakAway for further discussion and demonstration.

## THE FUTURE OF TRAINING



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