

ISSUES IN CANCER SURVIVORSHIP

UNIVERSITY OF UTAH



Incentive spirometer inspires a video game that encourages recovery in pediatric patients

Bette Weinstein Kaplan

What does a superhero's victory over a robotic crab have in common with a child's battle with cancer? Everything—according to the doctors and graduate students at the University of Utah in Salt Lake City who developed a video game to help young cancer patients rebuild lung function. The University of Utah was the focus of a unique collaborative arrangement among the pediatrics and medicinal chemistry departments at the Primary Children's Medical Center at the University of Utah Medical Center, the Entertainment Arts & Engineering (EAE) program from the University of Utah, and a coordinating team of teachers and graduate students from both facilities. The result was a game designed to increase the physical strength of pediatric cancer patients and give them a sense of empowerment to fight their disease.

THE INSPIRATION

A simple incentive spirometer in a young boy's hospital room inspired Grzegorz Bulaj, PhD, assistant professor of medicinal chemistry at the University of Utah, to think about using a game to achieve treatment goals. He saw the act of raising the ball in the plastic tube as a game whose end result could encourage deep breathing and prevent pneumonia. He decided there was a need to create a different type of game

for patients such as the young boy he had just seen, and he contacted Carol S. Bruggers, MD, professor of pediatric hematology/oncology at Primary Children's Medical Center.

A circuit of positive impulses "After talking to [Dr. Bruggers]," Bulaj said, "the idea was defined like this: We activate the circuits in the brain that connect the part responsible for keeping us highly motivated to the part that contains motor activity." Through the association of physical activity with motivational stimuli, "a new circuit of positive impulses would then be developed that would make patients feel stronger as they fight an illness. Possibly more importantly, they'll have fun doing it."

EMPOWER THE PATIENT

Bruggers researched the idea of empowering patients so they become confident they have the ability to control seemingly impossible situations. This concept is effective for stroke victims, helping them to make meaningful progress in physical therapy, she explained. "Patients who are more empowered are presumably more likely to be willing to fight their disease and maintain their treatment for a longer period of time."

Although hopelessness can be pervasive in cancer patients, Bruggers believes that the video game will

actually give patients a sense of hope, which of course is a great incentive for healing. Bruggers found the project exciting because it gave her the opportunity to help create something that has the potential to help many people, and be "useful and fun for kids."

AN INTERACTIVE VIDEO GAME

The university's Entertainment Arts & Engineering program, which teaches students how to make video games, joined the effort. The doctors' objective presented the students with a real-

The superhero grows stronger as he keeps fighting his enemy.

world situation, making it the perfect challenge for them. The result is the PE (patient empowerment) Interactive Video Game. The EAE team created the game specifically to meet the needs of pediatric cancer patients, as Bruggers had requested. There is no violence, death, killing, or gory graphics, yet the player must be able to do battle to keep growing stronger. The superhero's enemies are robotic, so even they are not killed. "The students did an

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amazing job of reconciling battle with healing and fighting with positivity,” said Bruggers.

The students met with pediatric physical therapists and social workers in order to gain an understanding of the needs of pediatric cancer patients and to identify factors important to their healing. The game uses imagery and metaphor: the superhero, the principal character of the game, grows larger and stronger as he keeps fighting his enemy.

The final product is a five-level, multiplayer game that employs motion control technology and has original

The game becomes more challenging as the player advances through the levels.

music, characters, and graphics. It is portable; therefore, it can be used in a hospital room without interfering with hospital monitors and telemetry, as other motion-controlled devices do.

The game becomes more empowering and physically challenging as the

player advances through the levels. The developers took into consideration that patients with cancer have unique limitations, and they worked within those parameters. The video game improves the patient’s endurance and heart rate without the patient even realizing how much effort he or she is exerting, and as the patient progresses, his or her outlook improves as well.

What is the best part of the PE Interactive Video Game? That’s simple: the superhero always wins. ■

Bette Kaplan is a medical writer based in Tenafly, New Jersey.



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The Four-Fold Way: Walking the Paths of the Warrior, Teacher, Healer, and Visionary by Angeles Arrien

A leading expert on native spirituality and shamanism reveals the four archetypal principles of the Native American medicine wheel and how they can lead us to a higher spirituality and a better world. HarperOne; 1993

Meaning in Suffering: Caring Practices in the Health Professions, Vol 6 edited by Nancy Johnston and Alwilda Scholler-Jaquish

Compelling, timely, and essential reading for healthcare providers, Meaning in Suffering addresses the multiplicity of meanings suffering brings to all it touches: patients, families, health workers, and human science professionals. University of Wisconsin Press; 2007

Turning to One Another: Simple Conversations to Restore Hope to the Future by Margaret J Wheatley

“I believe we can change the world if we start talking to one another again.” With this simple declaration, Margaret Wheatley proposes that people band together with their colleagues and friends to create the solutions for real social change, both locally and globally, that are so badly needed. Such change will not come from governments or corporations, she argues, but from the ageless process of thinking together in conversation. *Turning to One Another* encourages this process. Berrett-Koehler Publishers; 2009