

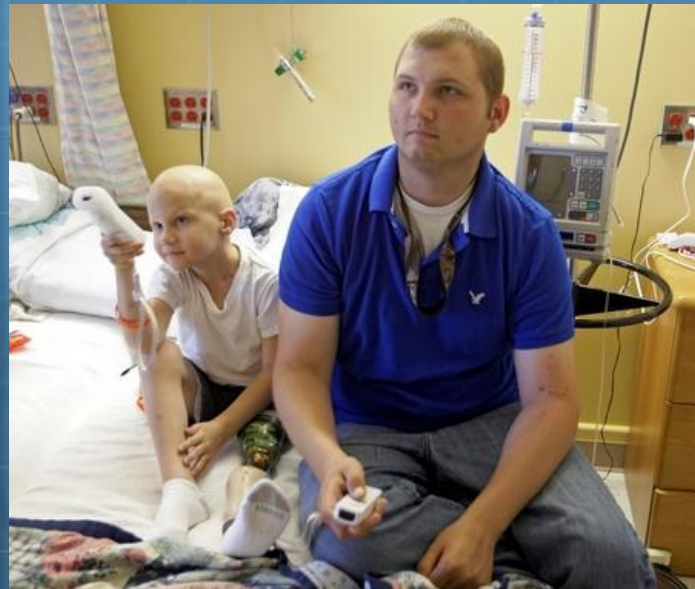
# Biofeedback Games for Health and Therapy



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# Commercial Games for Health

Nausea and anxiety management



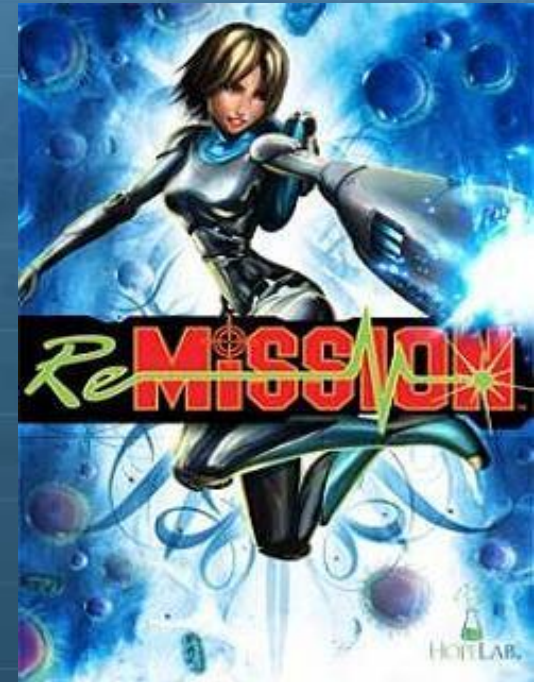
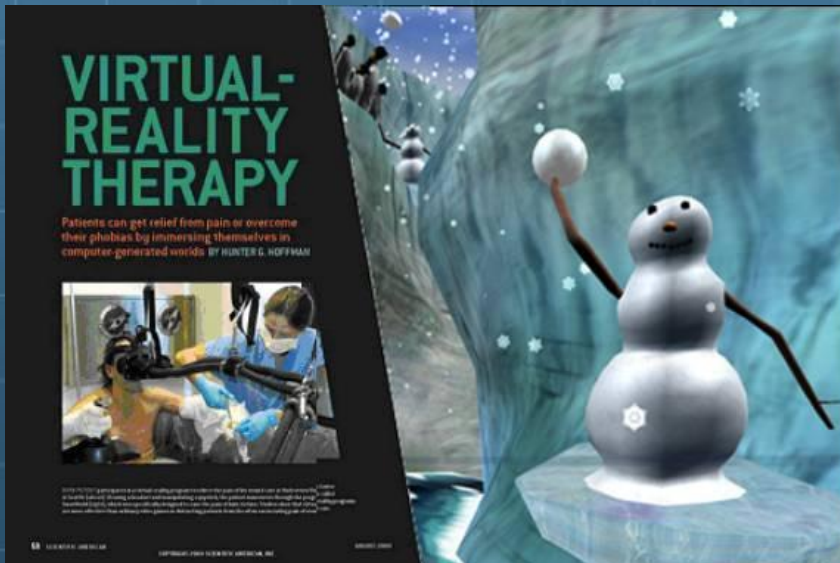
# Commercial Games for Health

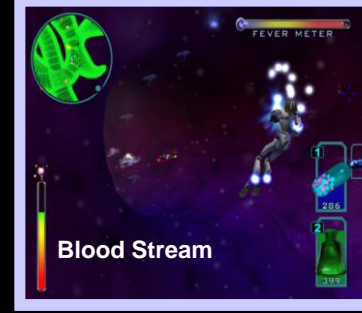
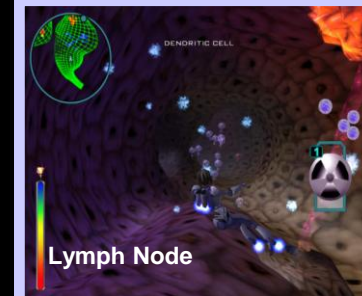
Physical therapy and physical fitness



# Tailor-Made Games for Health

Diabetes  
Asthma  
Burn pain  
Cancer





## Re-Mission 7 Cancers

- ALL
- AML
- Osteosarcoma
- Brain tumor
- Hodgkin's
- Non-Hodgkin's
- Ewing's Sarcoma

## 19 Patients

Diverse:

- Gender
- Ethnicity
- Age
- Location
- Disease stage

## 20 Levels

Adaptive difficulty

Diverse missions:

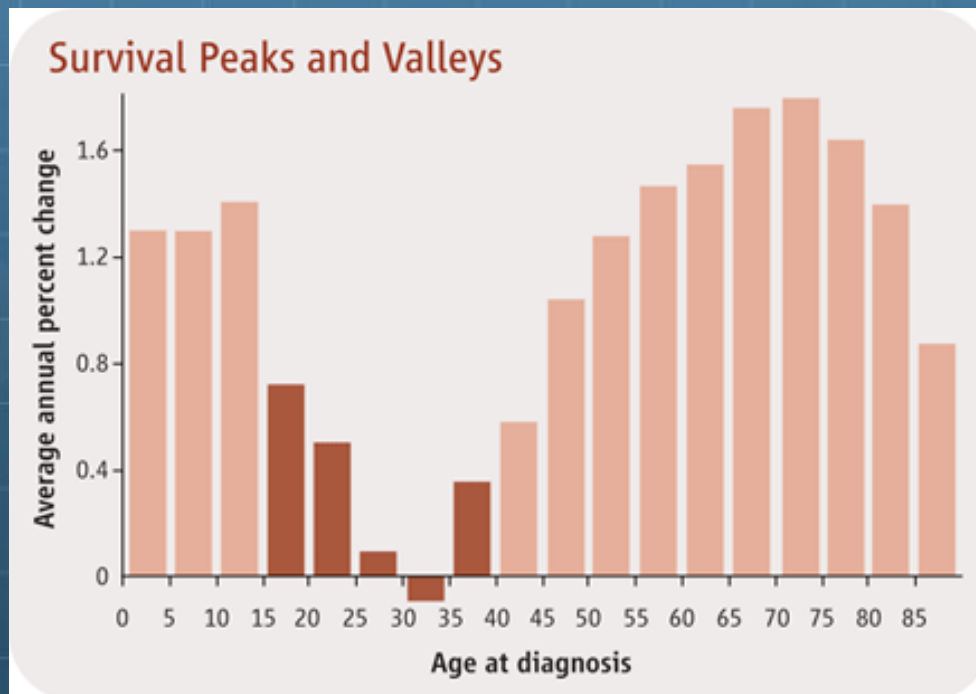
- Chemotherapy
- Radiation
- Metastasis ctrl.
- Infection ctrl.
- Stress mgmt.
- Pain mgmt.
- Bonus:  
immunotherapy

## 1 Intrepid Nanobot

# The Problem

## Adherence/Compliance to treatment

Effective cancer therapies available but adolescents and young adults not benefitting



# Re-Mission: A Game to Increase Adherence to Cancer Treatments



# How did we know it worked?

## A Randomized Trial\*

### Participants

374 Young people with cancer  
34 Medical centers

### Design

Control game vs. Re-Mission + control game  
0, 1 mo, 3 mo follow-ups

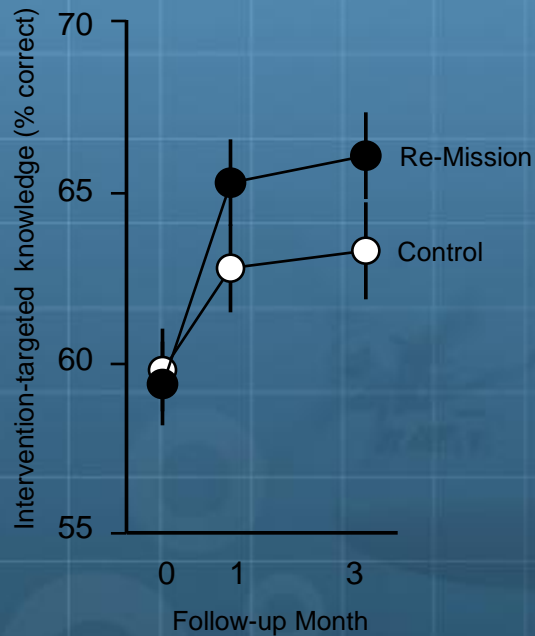
### Outcomes

Psychological and behavioral

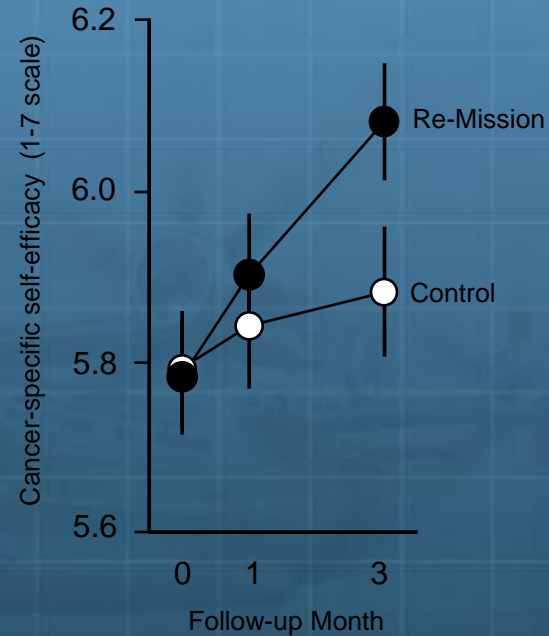
\*Kato, PM, Cole, SW, Bradlyn, AS, Pollock, BH. A video game improves behavioral outcomes in adolescents and young adults with cancer: A randomized trial. *Pediatrics* (2008);122:e000

# Results: Improved Outcomes

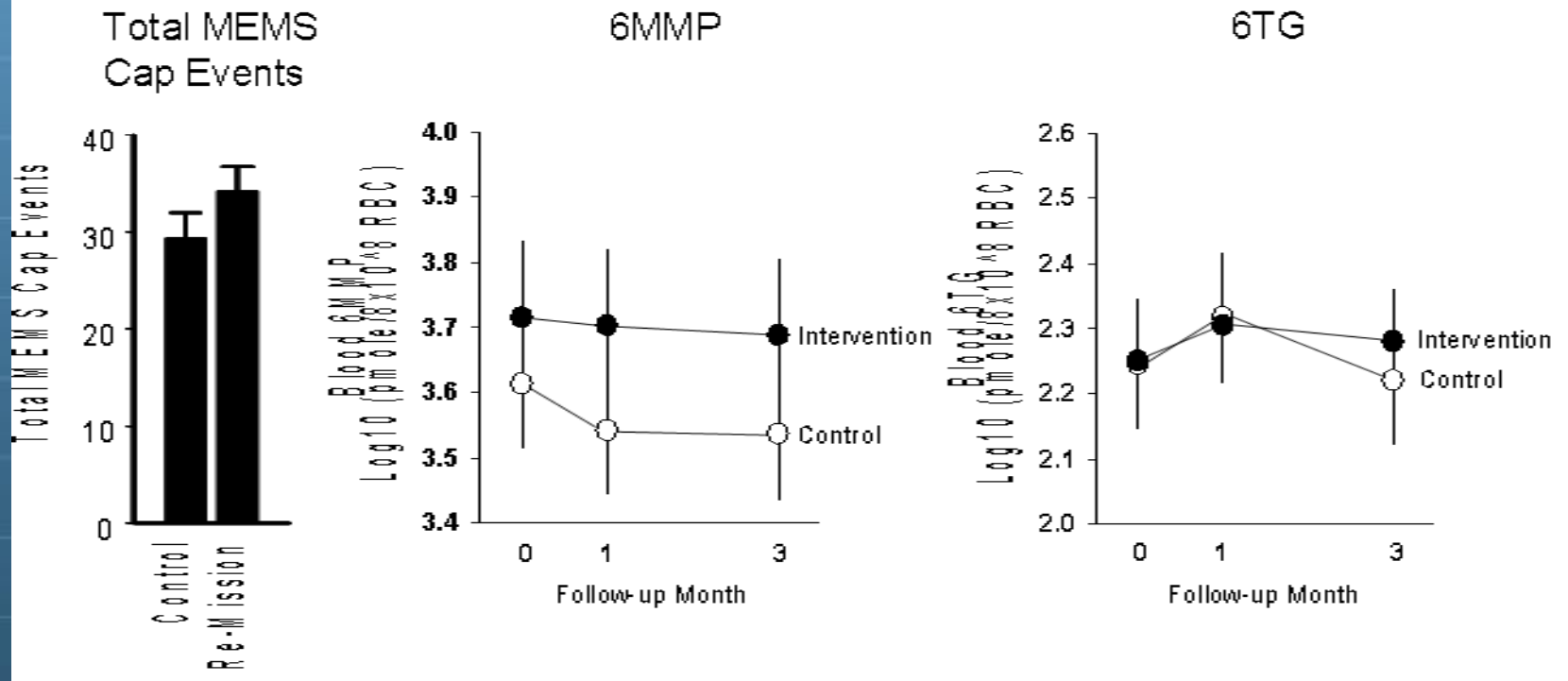
## Cancer Knowledge



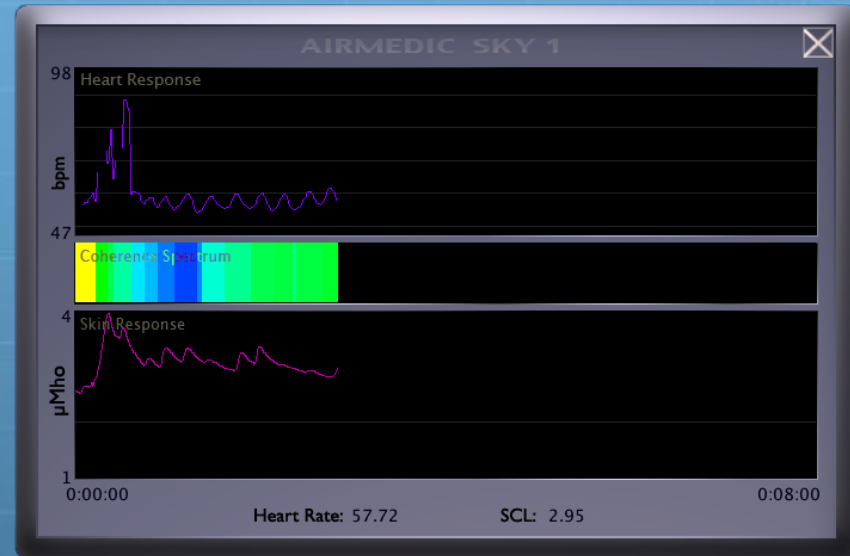
## Self-Efficacy



# Results: Improved Adherence



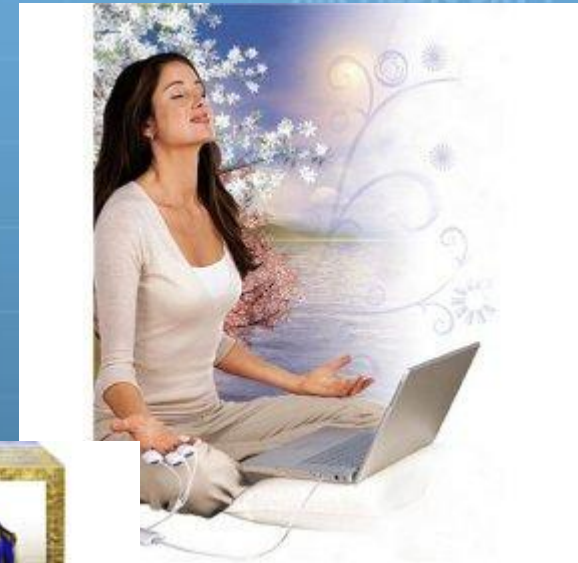
# Biofeedback



A method of treatment that uses monitors to feed back to patients physiological information of which they are normally unaware. By watching the monitor, patients can learn by trial and error to adjust their thinking and other mental processes in order to control "involuntary" bodily processes such as blood pressure, temperature, gastrointestinal functioning, and brain wave activity.

# Biofeedback Games

Journey to the Wild Divine  
Wisdom Quest  
Healing Rhythms

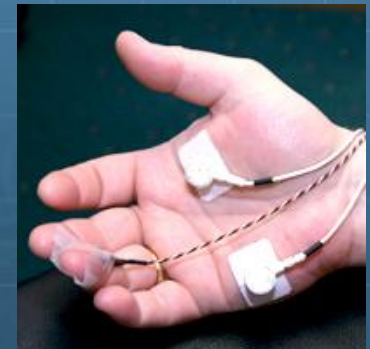


# Biofeedback Games for Health

Measurement of breathing  
function  
SpiroGame



Pediatric urinary incontinence  
PC-based golf, basketball  
and safari games



Irritable bowel syndrome  
Animation of the gut



# Patient Safety Biofeedback Game



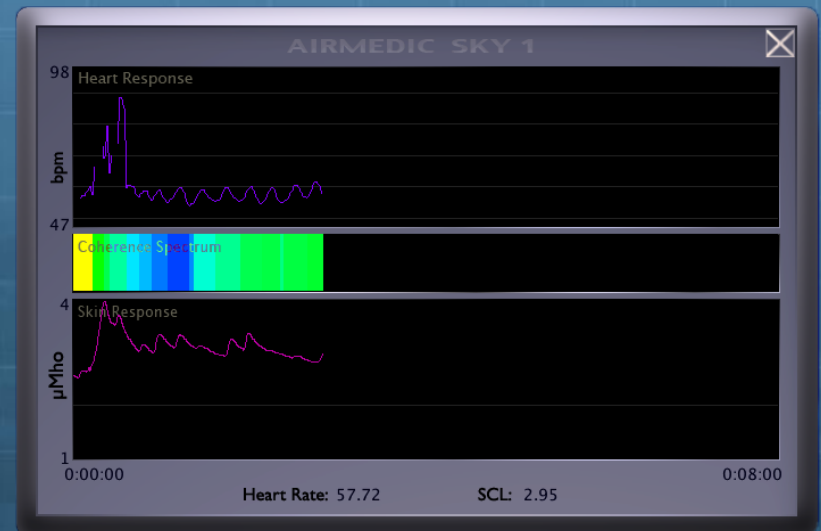
# The Problem

Residents who are **stressed**, **depressed**, and **burned out** make more errors



# Underlying Magic/Technology

## Biofeedback-from Wild Divine (Kyle Widner)



# Project Goals

## Goal 1

To make a cutting-edge, exciting video game that improves patient safety

## Goal 2

To conduct a rigorous research trial of the effectiveness of the game

## Goal 3

To make this game available to doctors in training throughout the world

# Competition

## Virtual Heroes HumanSim™

- Research Triangle Park, NC
- Software simulation platform to teach assessment and decision-making skills
- Teaches stress management through Brainwaves, Heart activity, Breathing, and Blinking Motion
- Company also contributed to the making of America's Army game



Dynamic Virtual Human Technology™



Team Training



Resource Management

# How our project stands out

## Lower cost

- Project cost lower
- Hardware less expensive

## Easier to distribute on a mass scale

## More engaging and fun

- Focus more on gameplay rather than simulation

# Conclusion

Projects should focus on doing research to determine effectiveness so we can avoid mistakes and build on strengths of the technology.

Solid research should be used to support claims.

Integrating biofeedback into games will help further the usefulness of this technology to improve health outcomes.

# Questions?

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All great truths begin as blasphemies.  
-George Bernard Shaw