VR IS GOOD FOR YOUR HEALTH

The Health Promotion, Prevention, and Treatment Potential of VR Games

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Take Home Message

Headset based immersive virtual reality technology offers a compelling opportunity to engage and motivate in game experiences that impact health-related understanding, decision-making, skills and behaviors.

Potential Audience includes:
Youth, Adolescents, Emerging Adults, Adults
Health care trainees and providers
Where We are Going

1) Health and Games are Unique Opportunity
2) Games Build Healthy Behaviors Already
3) Existing applications of virtual reality
Bradley Tanner, MD, ME

Physician by Training – Psychiatry and Obesity Medicine

Studio Head, HealthImpact.studio

20 years experience in NIH funding and running a small business specializing on online training, simulations and games for skills development and behavior change
Goal: Create games that can impact health.

Strategy: Start from an interesting game concept and add health impact on top.
Where is the Money - Globally?

More people playing video games than ever before

$65 BILLION WORLDWIDE GAMING SPEND

- $27B CONSOLE
- $10B MOBILE/TABLET
- $8B HANDHELD
- $8B SOCIAL/BROWSER

$12B PC

$12.1B PROFIT (Software)

Estimated 2 Billion Gamers in Q3 2015

Console leads w/ 42% global consumer spend
Where is the Money in the US?

2016 $30 Billion

2017 $36 Billion

Gaming

US Revenue

2017

$36 Billion
Perspective

Gaming US Revenue 2017
$36 Billion

- Console games: 31%
- PC games*: 23%
- Tablet games: 10%
- Smartphone games: 4%
- Browser PC games: 4%

* Boxed/downloaded

SOURCE: Newzoo
Gaming vs. Expenditure on Healthcare

Health Care
US Revenue 2015
$3205 Billion
Games Build Healthy Behaviors Already

✓ Novel Experience/Narratives
✓ Quick Decision Making
✓ Collaboration
✓ Focus on improvement and challenge and growth
✓ Team Building
✓ Eye-Hand Coordination
✓ 3D visualization and modeling
✓ Understanding Cause and Effect
Games to Address Obesity

1) Kids practice the process of rejecting (throwing) unhealthy food

2) Kids practice catching and saving unhealthy food

3) Bodily activity translates to cognitive change. Action is more powerful than knowledge
Food Acceptance & Rejection
Gaming Adds Value
Short Video

1) Control and self-determination
2) Engaging - Role-playing in VR engages the participant in a cycle of practicing change
3) Immersion instills flow or a sense of timelessness and focuses on the game at hand
4) Human Interactions
Practice in Different Environments
Gaming Adds Value - Control

Control and self-determination

Choices, decision-making opportunities (e.g., quick, medium, slow), feedback, levels of improvement, and the potential for success/mastery demonstration enable health-related impact.
Developing Food Fight

Lessons from Developing A VR Game

Presented Tomorrow

@ 2:30
Food Assessment/Selection/Avoidance

Teaching Grocery Shopping Skills to Young Adults
Gaming Adds Value – Engaging Short Video

Role-playing in VR engages the participant in a cycle of practicing change by

• initial self-reflection,
• taking action,
• post-action reflection,
• concluding,
• planning that promotes longer-term real-world behavioral change.
Nutrition Info – Key to Winning
VR and Disease Understanding

- Use game to teach cause and effect. Make choices (e.g., diet) and see the changes
- “Virtually” change and alter it
Gaming Adds Value – Immersion
Short Video

Immersion instills flow or a sense of timelessness and focuses on the game at hand that
• optimizes cognitive load,
• matching skills to challenge
• complements behavior change theories.

Intentional small breaks in flow will allow an opportunity for reflection.
Medical Assessment and Treatment
VR Human Interactions

1) Teach cause and effect.
2) Use flexible time by going backward to reversing choices.
3) Make recommendations to others and get feedback about the success/failure.
4) A simple way to practice making a decision without committing in even the virtual world.
5) Build empathy.
VR and Surgical Training
VR and Medicine/Health

1) Controlling acute and chronic pain including cancer, burn, and phantom limb pain,

2) Countering anxiety including phobias and PTSD with exposure, relaxation, and mindfulness

3) Rejecting cues in a virtual environment and impacting addiction

4) Enhancing amputee rehabilitation and correcting misperceptions of body image countered by virtual self-imaging.
1) Li Lan, Yu Fei, Shi Dongquan, et al. 

2) Koo Kyo-in, Park Dae Kwon, Youm Yoon Seok, Cho Sung Do, Hwang Chang Ho. 
VR Pain Treatment Game

- Actively control the Jelly Fish
- Tie the immersion to biomarker (e.g. pulse or other measure)
- For burn patient use a motif of putting out fire
- Support minimal activity since movement might hurt – control with head movement
VR Pain - Is It Just Distraction?

• What if VR is actually programming pain receptors in the brain and altering the perception of pain and the ability to tolerate pain?
VR - Cancer Treatment

Chirico A et al.
Virtual Reality in Health System: Beyond Entertainment. A Mini-Review on the Efficacy of VR During Cancer Treatment
. - PubMed - NCBI
VR Cancer/Inpatient Treatment Game

- Tie to recent blood-work – e.g., cortisol level
- Use to counter noisy environment
- Introduce predictability by mirroring the steps of treatment in the game
VR - Anxiety
VR Social Anxiety Treatment Game

- Practice situations in virtual environment
- Tie to pulse to provide immersion and flow linked to biofeedback
- Introduce sensory object in VR (soft fur)
VR Height Fear Treatment Game

- Build the environment you are afraid of (minecraft)
- Build the challenge that you have. For example build the bridge across the buildings to make it wide enough to challenge but not so wide it is too scary.
The Technology is Ready

It’s time to convince the leaders of medicine to take advantage of a new tool.