A Multi-Level Gaming Adherence Intervention for HIV+ Youth

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- **Goal:** To develop and test an absorbing, action-oriented game that increases ART adherence

Adherence information from the electronic, portable medication dispenser integrated into the iPhone app/game

Background

- Youth living with HIV (YLWH) have poorer rates of retention in care than adults and youth are more at risk for being lost to follow-up
- Percentage of prescribed doses of ARV taken by YLWH ranges from 50-75% in the US

Background

- Devices that record pill cap opening events for individual patients and providers have been more useful for measuring, rather than improving adherence

- Reminder devices and alarms, without informational or motivational components, are minimally effective in enhancing sustained adherence

Advantages to using an iPhone App/Game

- Can deliver health education during leisure time, outside of the clinic, cost effective, scalable
- Adolescents and young adults spend 1.13 hours per day playing interactive phone and computer games
- More than half of all video gaming occurs on portable devices: a handheld player (29%) or a cell phone (23%).

Packy and Marlon

- *I*mproved diabetes-related self-efficacy (p=0.07), self-care behaviors (p=0.003)

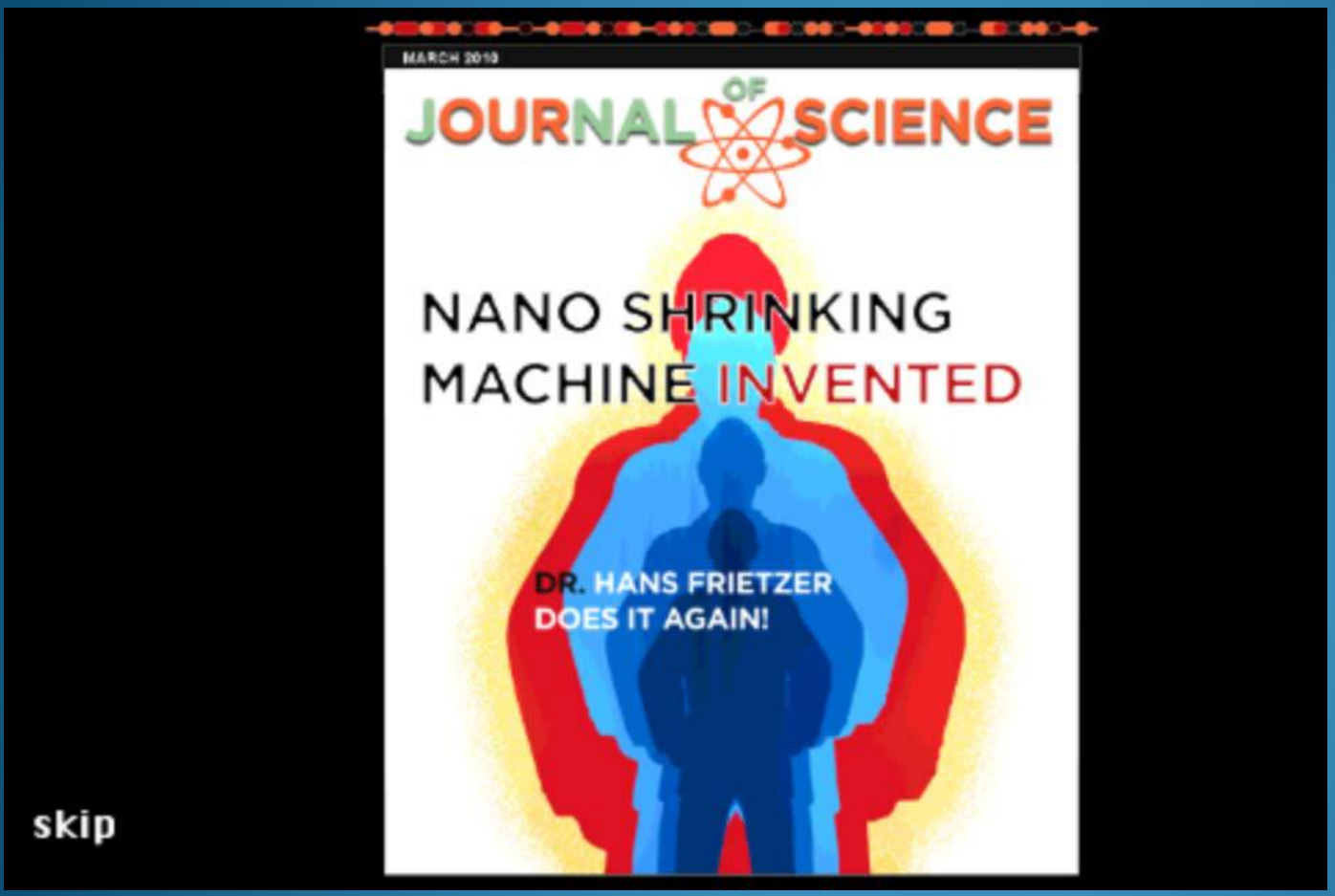
Bronkie the Brachiosaurus

- Playing the game for less than an hour resulted in significant improvements in asthma knowledge, self-efficacy

Re-Mission

- Improved adherence to medication (TMP/SMX) (p=.012) and 6-mercaptopurine (p=.002)

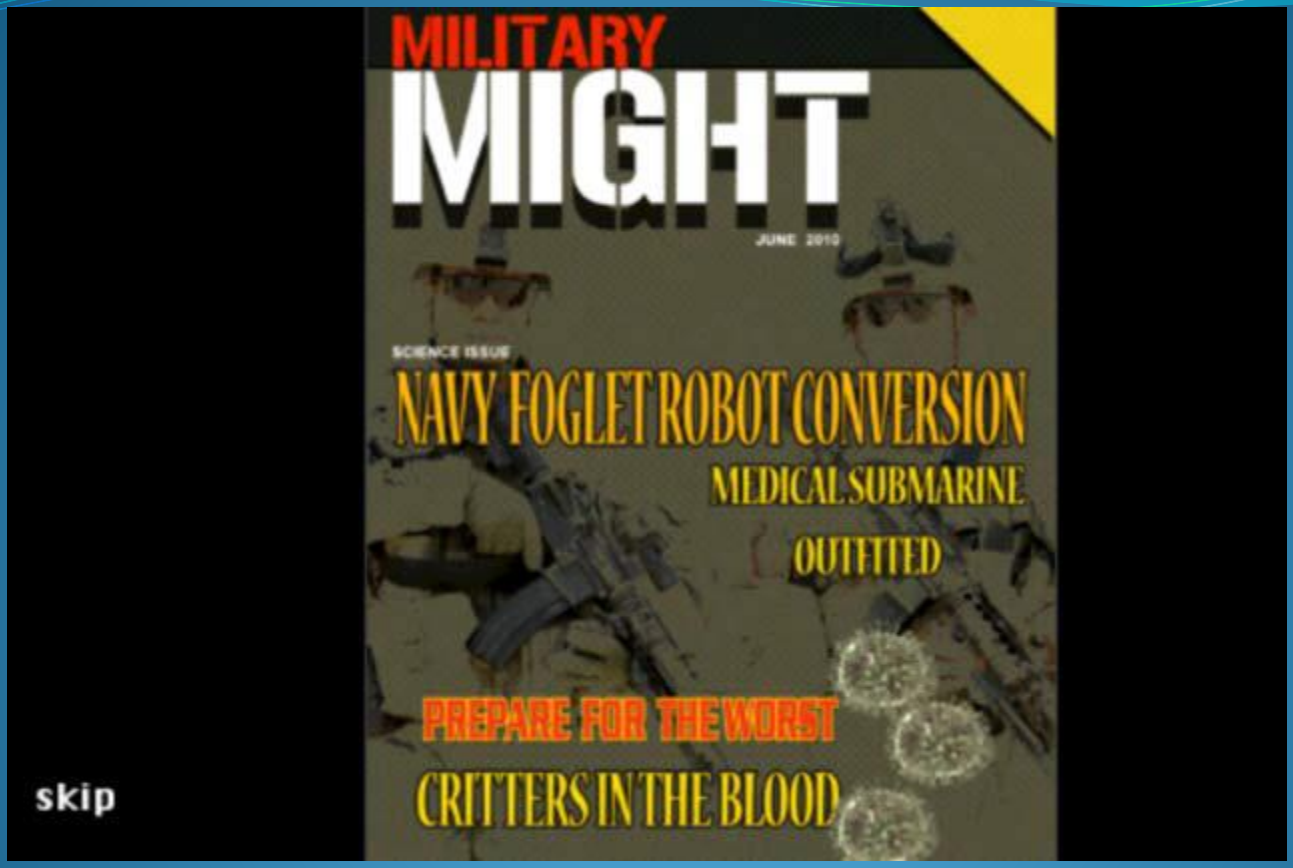
Our Game: Battle Viro



Battle Viro can be played on All handheld device

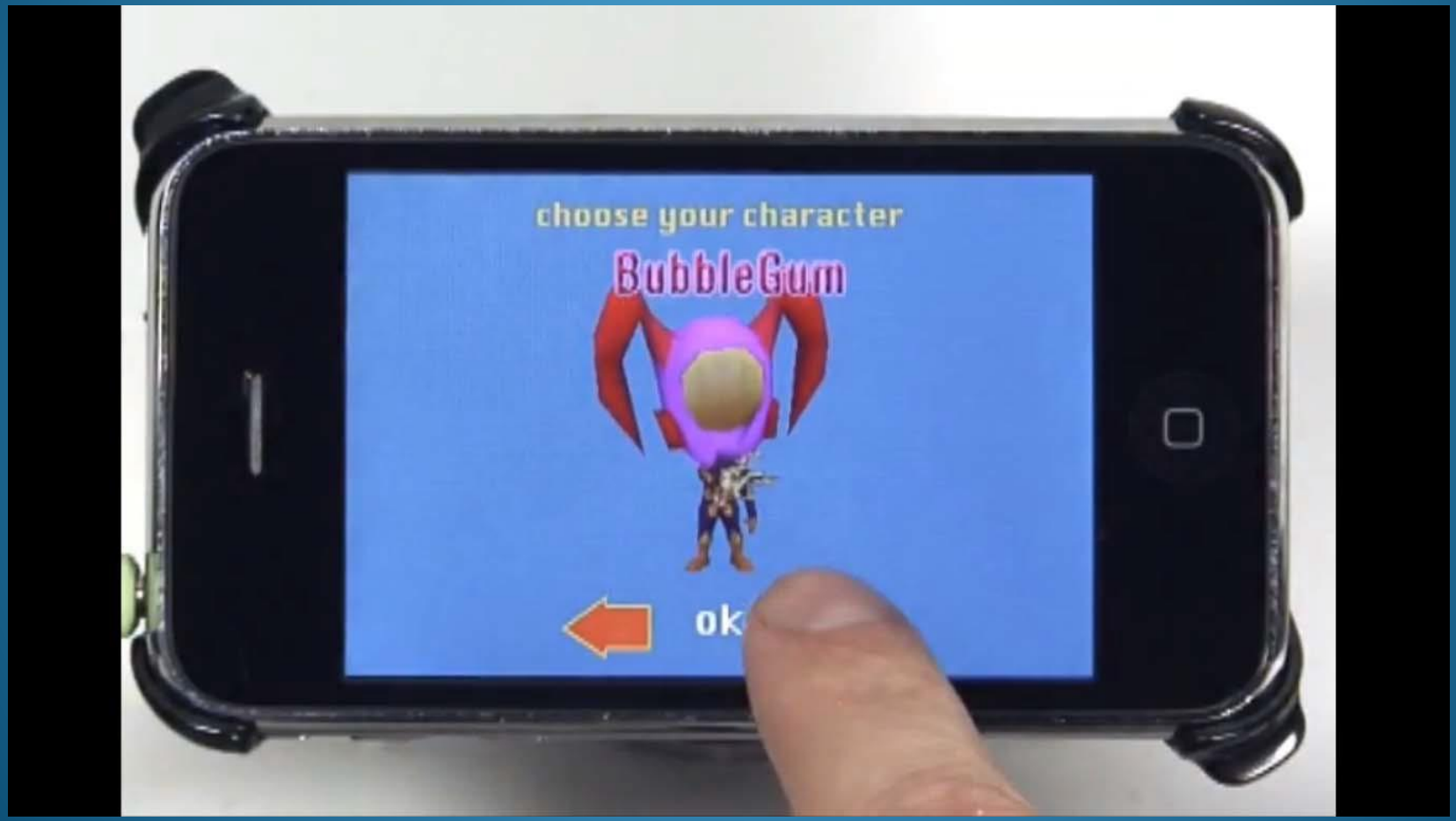
NO external attachments needed

Short narrative movie plays at the beginning of each new engagement with the game. The narrator explains that each player can design a nano-bot character that will be shrunken down using the groundbreaking nano shrinking machine developed by Dr. Hanz Frietzer



Once shrunken and inside the body, the players mission is to kill virus. In order to acquire ammunition and strength, players must take medications in the game
and in real life. Taking medication will directly Increase health status and number of lives.

After this narration there is an optional tutorial for first time players to become familiar with game controls


choose your character
BubbleGum
ok


choose your character
Vector
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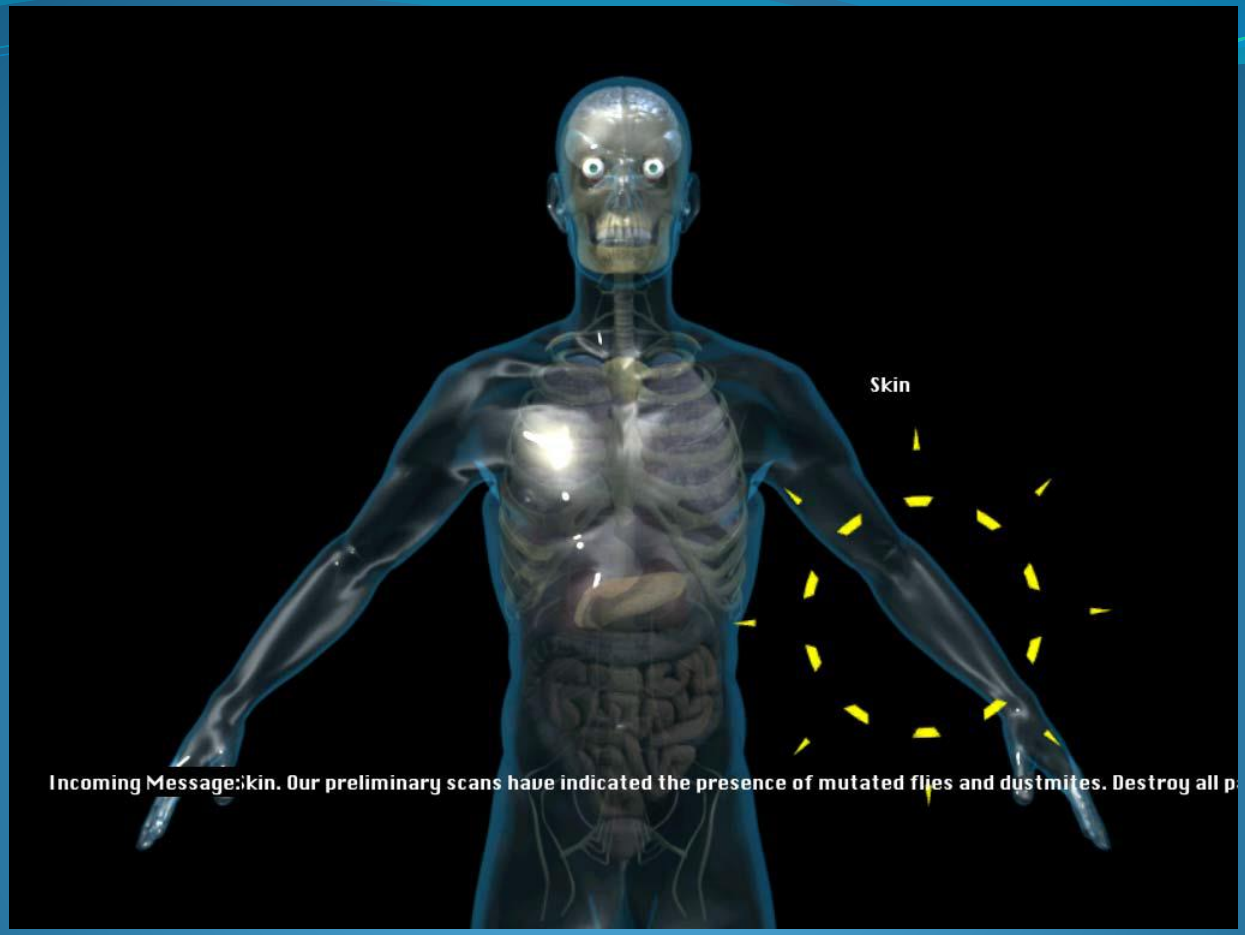


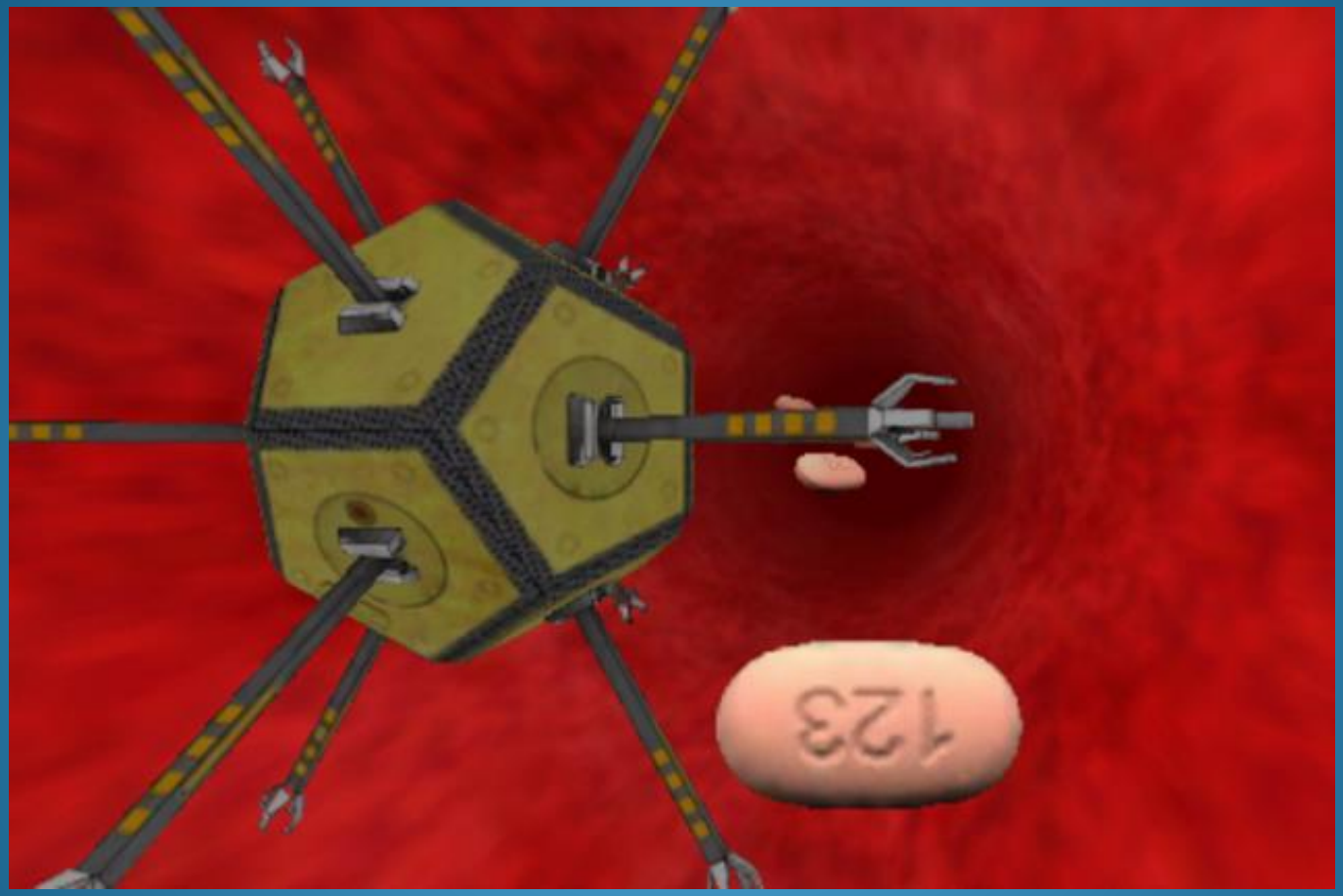
A players mission begins on the surface of their skin, each player, represented by their nanobot, shoots rapidly mutating virus, avoids parasitic flies, and picks up strength by picking up pills. As the nanobot successfully battles virus they are able to move into the arterial system.

Your nano-bot’s movements are made by using
cutting edge touch screen thumb controls that are integrated into the screen.

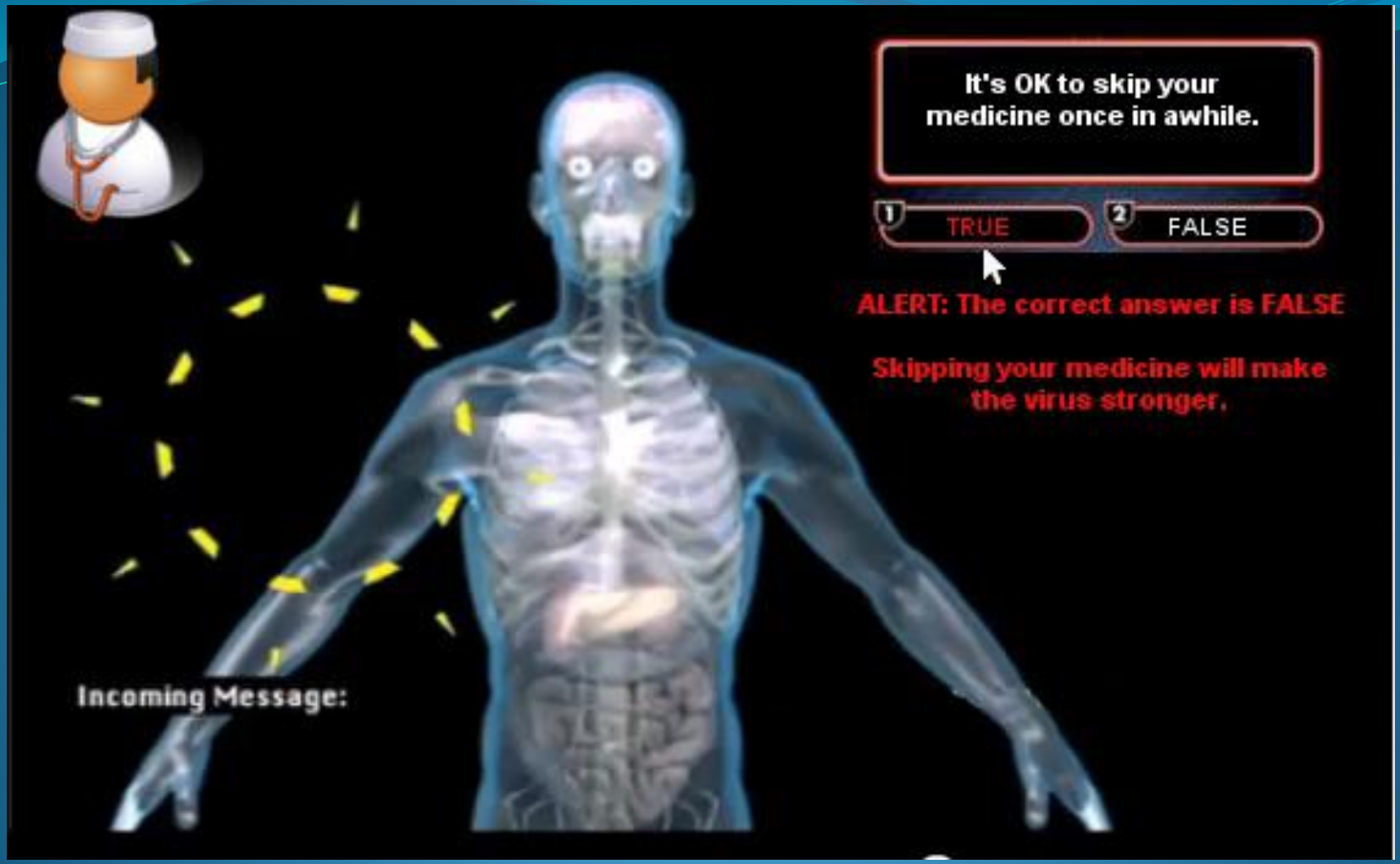
Battle Viro

In the arterial system, a player can pick up health by picking up pills

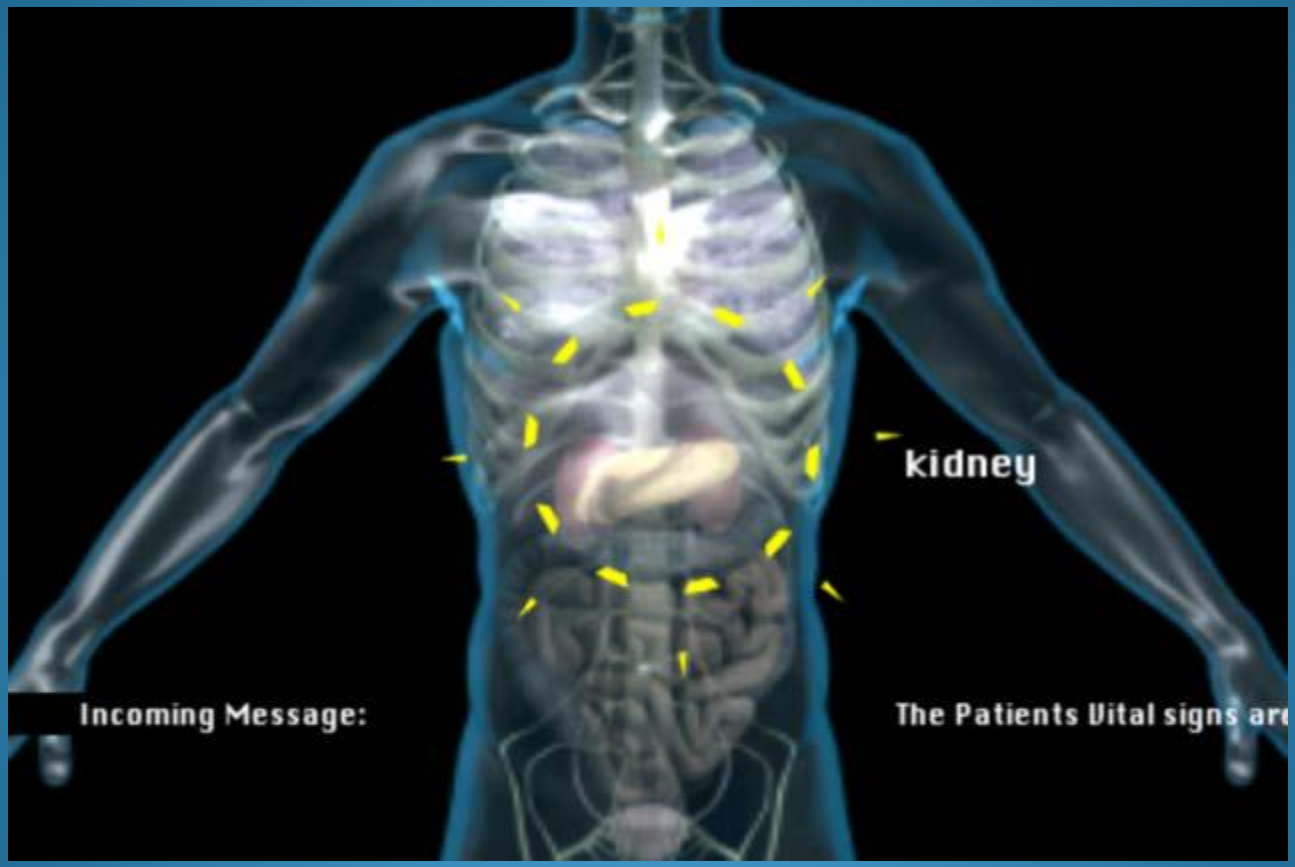
Battle Viro



Players can also gain access to artillery



Answering questions with allied doctors, and building knowledge, helps each player successfully move to the next level or area of the body


kidney
Incoming Message:
The Patients Vital signs ar

In the kidney, payers must destroy HIV embedded in tissue along side kidney stones

Each area of the body is a different colorful environment with unique and challenges.

In the liver, players must shoot down flying virus and stop toxic leakage from spewing

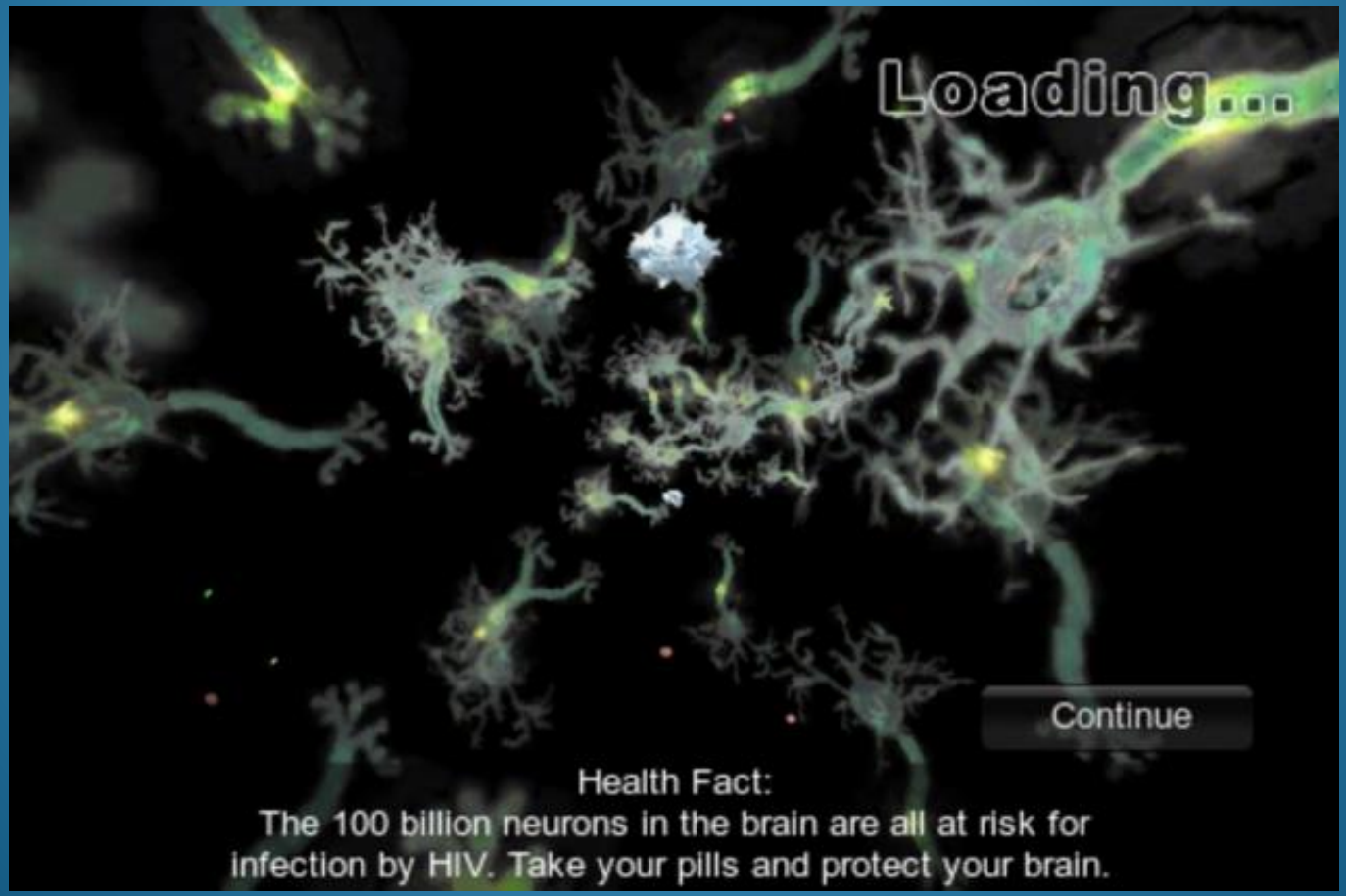
Players travel to the eye in a foglet robot ship. Here they must destroy CMV, capture more health (pills) and destroy more attacking virus, while avoiding explosions

In the brain, a cryptococcal storm, players must hop between islands of healthy brain tissue, avoiding electrocution, while battling bacteria and virus, and picking up health.

Battle Viro


Widow Maker
Great job!
Your health is improving.
Keep it up!
ZOOM
A

Battle Viro


Loading...
Continue
Health Fact:
The 100 billion neurons in the brain are all at risk for infection by HIV. Take your pills and protect your brain.

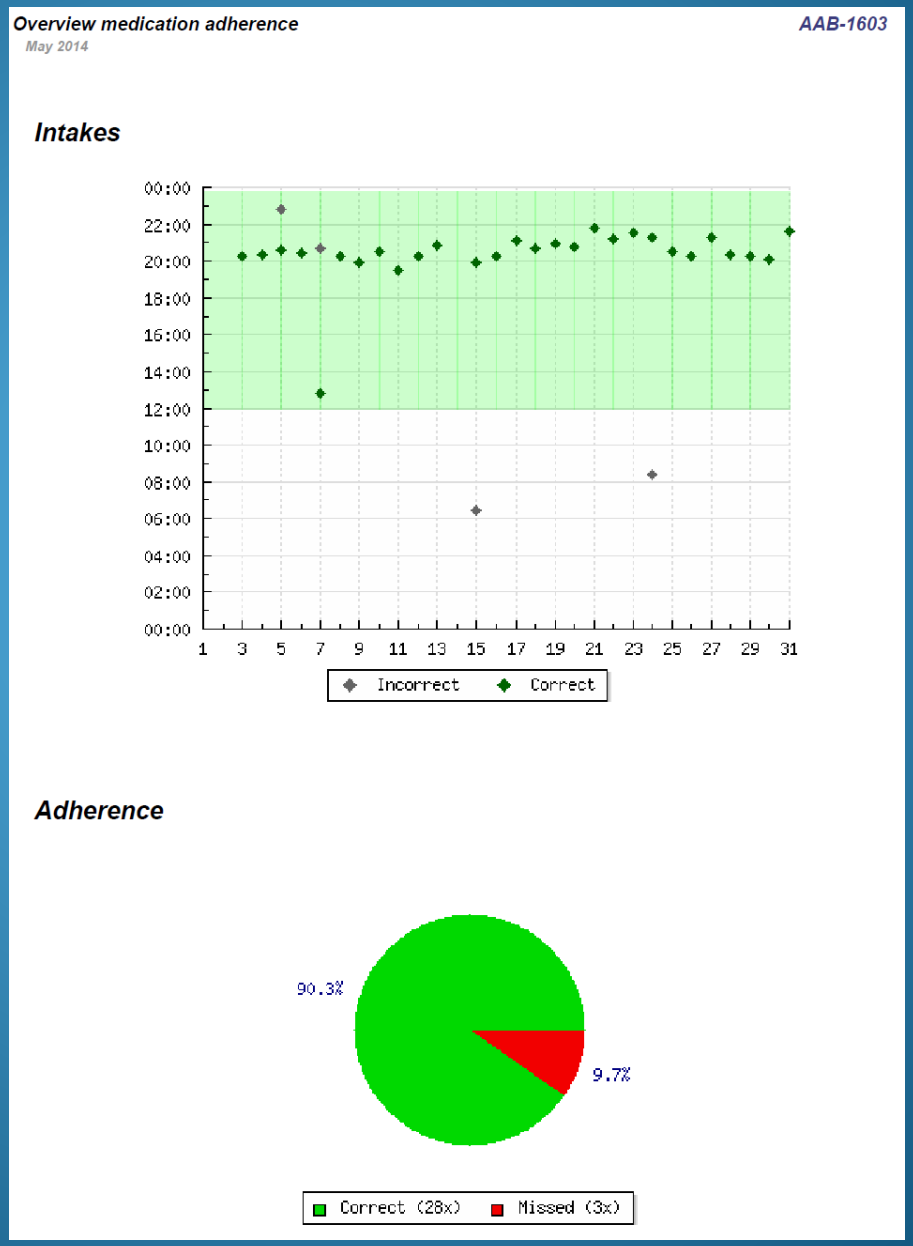
At the end of each mission or body level a players score is summated

Electronic medication measurement

Integration trough a Database built by MCS.

At the end of each week players adherence Information is integrated in to the game and players are sent text messages of encouragement (<90%) congratulations (>90%)

Adherence also leads to artillery and nanobucks



Text Messages and Game Enhancements

- “Get Back in the Game, Battle Viro needs you.”
- “Excellent job in battle this week, artillery has been added to your arsenal.”
- “Your successful efforts have paid off, you have received more Nanobucks.”

Two Major Phases of Research

- A **Development Phase** (n=20)
- A small, pilot **Controlled Trial Phase** (n=60)

Sample

- Mean age: 22
- Male: 61%

- Hispanic: 11%
- Black: 53%
- White: 29%

- Heterosexual: 39%
- Homosexual: 39%
- Bisexual: 22%

- Completed 12th grade: 61%

- **Missed dose in last week: 59%**

Qualitative Phase

- Client Service Questionaire (CSQ): 8 items, assessed general satisfaction
- Session Evaluation Form (SEF): 13 items assessed feasibility and perceived utility of the intervention.
- Structured Qualitative Interview

SEF and CSQ Responses

- **How satisfied were you with activities in this game: 91%**
- **I learned a lot from this game: 82%**
- **The game was well organized: 73%**
- **The game topics were interesting: 80%**
- **If a friend were interested in this game would you recommend it: 82%**

SEF and CSQ Responses

- **Games topics stimulated my interest in the material: 64%**
- **Game topics were relevant to my life: 55%**
- **I was able to do the activities: 55%**
- **Would this game/pill bottle meet your needs: 63%**

Qualitative Interview

What did you like most/least about the game?

What would you change about this game?

How easy was it to understand?

Do you think this game would help you take your meds?

Did you like the weekly text messages?

Feedback on Game

- **Liked**: "Progression through organ systems," "fighting what's inside the body," "shooting and killing the viruses," " I liked taking pills and fight HIV, it mimicked real life experience," "it was cool that I am playing a game about HIV, that it was like tailored to me," " sound effects and music were cool," "I liked it, I told my friend about it."
- **Disliked/ Changes Recommended:** "I knew most of the random facts," "I think there should be facts about other health stuff, about smoking, exercise and diet," " I would like better orientation to the levels," "there needs to be instructions or hints when it gets hard," "it needs a level where the person is at the doctor's office having blood work drawn," "more tips about medication side-effects," " I want an easy version and a hard version."

Feedback on Pill Bottle Cap

Liked: "It's cool how it links with game," "awesome that there is a bottle that knows what you are doing."

Disliked: "I hated it," "It was annoying because I can't just carry it, it's too big," "I would rather use my 7 day organizer," "I never used it, I would open it every time I took a pill out of my normal 7 day organizer." "I had to empty all my different pills into the same bottle, I like a daily organizer better."

Feedback on Text Messages

Liked: "They reminded me to take my medications, " I liked the pictures and that the texts seemed upbeat/cheerful," "they were good and they made me kinda want to play the game again," "I am glad they did not say HIV in them."

Disliked: "Often it would say the same thing," "I would like messages that were consistent with the theme of the game."

-Sub orders are that you take your medications at 8am because mission headquarters says it's vital for your health

-keep up the good fight soldier

"You should use some emojis, that is like how people text."

Changes in preparation for RCT

- **To improve game:** Two modes of play (hard/easy), written messages & hints throughout of each level, better narrated instructions at the beginning of each level, general health facts (smoking, eating healthy), more facts about HIV and increased sophistication of facts, doctors office/lab scene
- **To improve texts:** emojis, 10 different text messages utilizing phrases recommended
- **To improve pill measurement:** moved to 7 day organizer (wisepill)

Next Steps

- Game revisions at MCS
- A small, pilot **Controlled Trial Phase** in which we will evaluate the acceptability and preliminary efficacy of the IMB Gaming Adherence Intervention compared to a comparison condition (n=60)