



Background Cancer Information & Suggested Design Approaches

Introduction

The purpose of this document is to convey some basic background information on the types of cancer that Re-Mission focuses on, and to offer up some suggested approaches for incorporating this information into an entertaining game design. Overall, we are trying to make a fun game that is comparable to commercially available games, while still accomplishing the clinical impact goals of the game.

Meeting Clinical Impact Goals

Our goal is to teach a player about cancer and the importance of adherence to treatment regimens through gameplay. Here is what we hope will happen when patients play our game:

- They will take their medications as directed. (especially patients who have to take chemotherapy in pill form on a regular basis even though tests show no sign of cancer)
- They will feel a stronger sense of control over fighting their cancer.
- They will do things to prevent and treat infections (e.g., report fevers, wash hands, stay away from sick people, rinse and clean their mouth frequently).
- They will use non-medication tools to manage and cope with pain and nausea (e.g., relaxation techniques, treating their infections, having crackers or candy on hand).
- They will keep their energy up by getting enough sleep and eating enough.
- They will feel more comfortable talking about cancer.
- They will be more optimistic and hopeful about the future.
- They will feel more capable of actively handling stress in their lives.

We want to reinforce these message through fun and entertaining gameplay:

- The objectives of each mission, the design of the weapons, and the behavior of the actors should reinforce the messages we are trying to send to the player.
- Gameplay should not undermine the impact goals.
- A message that isn't fun or part of the challenge isn't remembered.



- Avoid simply showing a slide show or lecturing the players or having them press a button that isn't attached to a specific and fun action.

Cancer and Bacteria Behavior

The gameplay occurs in the context of interactions between the hero and the enemy. If presented and balanced well, it is this interaction that makes a game fun

Types of Cancer and associated side affects

The target audience for Re-Mission is adolescents and young adults, and therefore our designs are focused on the types of cancers that typically affect this population.

These cancers are:

- Ewing's Sarcoma
- Non-Hodgkin's Lymphoma (NHL)
- Hodgkin's Disease
- Brain Tumor
- Acute Lymphocytic Leukemia (ALL)
- Acute Myeloid Leukemia (AML)
- Osteosarcoma

In addition to targeting the various cancers within our level designs, Re-Mission also aims to help players address some of the common side affects. These include, but are not limited to:

- Constipation
- Bacterial Infection
- Nausea
- Anxiety
- Pain Management

Characteristics of Certain Types of Cancer

A lot of behavior and gameplay can be drawn from real behavioral characteristics of cancer. Certain types of cancer do all of the following in one form or another:

- Floats in the bloodstream and other body fluids (ALL, AML, NHL, Hodgkin's)
- Clumps into masses (solid tumors: Osteo, brain tumor, Ewing's Sarcoma)
- Detaches from clumps and floats in the blood stream to spread elsewhere.*
- Replicates and grows through cellular division (all cancers)
- Grow and extend tendrils out to other areas of the body (tumors)
- Absorbs valuable nutrients (energy) from the body
- Tumors block vital functions and passages (blood flow, organ function)
- Releases chemicals to attack other cells
- Often acts or looks slightly different in different patients
- Often is difficult to identify from normal tissue without the use of chemical x-rays

** Note: Floating cells spawned off of tumors may act different than the tumors.*



Characteristics of Bacteria

The characteristics of bacteria make even more opportunities for gameplay and overlap the functions of cancer in some ways:

- Floats in the bloodstream and other body fluids
- Crawls along tissue walls by oozing or shooting out tendrils to pull itself
- Replicates quickly to overcome body defenses (weakened by chemo)
- Clumps into clusters attached to walls which spreads
- Harms tissue and cells it comes into contact with (except for those attacking it)
- Detaches from clusters to float or crawl elsewhere
- Absorbs valuable nutrients (energy) from the body
- Releases chemicals to attack other cells and tissue
- Swarms target cells and tissues to destroy and feed upon them

Potential Ways of Translating into Game Mechanics

Combining the core game play elements with characteristics of cancer and bacteria, there are a variety of ways to create game mechanics while remaining within the science fiction biological setting. Below are just a few examples of some suggested approaches to behaviors that can be assigned appropriately to specific forms of cancer or bacteria represented in the game.

Example explanation:

- *[Behavior and challenge to the player.]*
 - *[Possible approach for how the player might overcome the challenge.]*
- Cancer and bacteria move by floating, rolling like a blob or by shooting out tendrils and pulling themselves along (variety is tied to form of cancer)
 - Player must choose their targets, tactics and weapons carefully to overcome.
- Cancer and bacteria move to grapple or hit Player.
 - Player may have to dodge or use defense moves to hit back.
- Cancer and bacteria may stick to Player and drain energy (health) from her.
 - Player may have to find power-ups to recover.
- Cancer and bacteria may swarm Player to prevent her from moving
 - Player must use their self-defense move to break free.
- Cancer tumors may block passages, blood flow or normal organ functions.



- Player must destroy the tumors for blood to flow or organs to function.
- Cancer and bacteria cells may use the environment to hide and surprise Player.
- Player may overcome this with radar scans (chemical x-ray).
- Cancer tumors may thrust like groping tendrils out of tissue walls for a surprise attack, rooted once revealed but stretching towards the player to create a hazard.
- Player must be ever vigilant and respond quickly to sudden attacks.

Cancer and bacteria might shoot at the Player in one of the following forms:

- Floating cells may launch themselves like a missile towards Player.
- Player must dodge, aim and shoot accurately to avoid getting hit.
- Floating or crawling cells may stretch an appendage to hit Player like a whip which shoots out and retracts.
- Player must dodge, keep their distance and strafe attack when close.
- Floating or crawling cells may stretch an appendage to hit Player like a sticky web to damage or immobilize her over time.
- Player must use special moves to escape or look for power-ups to recover.
- Cancer uses cell division to launch loose cells at Player.
- Player must time their attacks to the *wind up* seen in the cell division.
- Cancer and bacteria clumps (like “boss monsters”) may throw cancer cells at Player.
- Player must learn to kill the boss monster first to stop the generation of new cancer and bacteria cells.

Patient Sensitivity

Cancer is a very serious disease that affects real people. We believe strongly in the potential good Re-Mission does in motivating patients to fight their cancer, and in subtly teaching them through gameplay what they need to do and why

Here are some answers to common questions on this subject:

Q: Is it okay to harm the patient?

A: Yes. We don't want to stop players from exploring what might happen if they do too much damage. They should experience a consequence (failure) if they do not perform



correctly. Any procedure done wrong will hurt the patient, and the player can fail the mission if the collateral damage to the patient gets too great. Failure can result in yanking the player from the mission or to your last save point. Collateral damage should never be an objective or otherwise condoned behavior (i.e., shooting white blood cells may be unavoidable on occasion, but the player shouldn't get rewarded for it and should in fact suffer a negative consequence if they kill too many).

Note: Collateral damage in the game actually helps us reach impact goals. If a patient aims too much radiation in an area for too long, it can cause tissue damage. If you use too much chemotherapy, you kill the good cells in your body too. This is also a reason why patients get rounds of chemo. If the chemo were constant, the patient would die from the damage the chemo does to the healthy cells in the body.

Q: Is it okay to imply pain to the patient or objects that cause pain?

A: Yes. The target market is 13 to 29 year-olds who by now are probably used to getting poked and prodded. These patients manage pain on a regular basis, so if poking a nerve causes reaction by the patient, that's okay. If anything, it makes the game setting more real and compassionately acknowledges the fact that the experience is painful. It will make the game more believable to patients.

Q: Is it okay to make cancer scary and menacing?

A: Yes. Cancer is menacing and makes the perfect adversary. Scary looking *monster* cells are one possible way to make it obvious what you need to attack. Patients themselves want the cancer to look scary.

Sci-Fi Biological Setting

All of the actors and their behaviors that make up the design should be based in a biological setting. As much as possible, the environment and everything in it should look and act like something that occurs inside a human body. This is, however, a work of science fiction, so taking some license to make it as fun a game as possible is certainly acceptable. We have already done so in the existing version of Re-Mission by turning otherwise static cancer cells into moving, menacing enemies inspired by the behavior of cancer.

- With the exception of the player and her weaponry, all actors should move and behave within a biological framework to meet player's expectations that they are fighting cellular life-forms.
- Wherever possible, the look and behavior of the cancer cells should be inspired by the actual form of the cancer.