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STEP UP App

Developing a mobile app that incentivizes teenage cancer care patients to remain active and promote movement during their stay through incremental rewards/progress.
STEP UP App
The STEP UP program in the Inpatient Cancer Care Unit at Seattle Children’s Hospital is in need of an app that is mobile/tablet friendly. Patients in the hospital need to stay active during their stay which could last for a month or even longer. Currently, patients are encouraged to walk a marathon during their stay and get a laminated paper foot per mile walked. This may not be very enticing for teens and young adults, so the app would need to better motive them to explore/move during their stay.

Team A
Team Members: Kaya Bramble, Zach Grande, Shivank Mistry
Co-Designer: Laura Matson

Our team plans to create an app that functions as both a movement tracker, as well as a game. The movement tracker will keep track of walking steps or laps, as well as stretches chosen by the physical therapist. The data will be displayed for the user to see how close they are to reaching short and long term goals, such as the marathon. Another way we would like to motivate patients is by creating a board game that incrementally rewards them for reaching their daily or weekly goals. They will be able to customize their avatar that moves forward on the board game as they continue to stay active.

Wireframes designed in Figma.

Concept art for what we imagine our board game feature will resemble. Patients will progress along our game board for achieving movement goals (set # of laps), reaching hospital exploration objectives, and doing daily recommended stretches.
Team B
Team Members: Harmeet Singh, Sara Behbakht, Kenny You, Aaron Tsang, Tahmin Talukder
Co-Designer: Laura Matson

We are aiming to create a design that is easy to use by everyone and can be applied to many different scenarios. Although we are starting with just the cancer care ward, we would like to expand to other populations. Development will be done using Figma and Visual Studio.

iPad concept layout designed in Figma.

Web application design. It includes two tables, one to keep track of daily exercises and one to have an overview of the week. The idea is to provide a quick interface to have information easily accessible.
Mobile Arm Support

Creating a mobile arm support that significantly improves the dystonia patient’s ability to feed herself to minimize assistance from others and frustration from undesired arm movements.
Mobile Arm Support
A 6-year-old girl has cerebral palsy, which causes her arms muscles to contract involuntarily and results in lower muscle tone and stiffness. As she grows older and becomes more independent, we would like to design a tool or device that allows her to navigate through her daily tasks, from brushing her teeth to helping take care of her newborn sister. Insurance does not cover mobile arm supports, so cost also needs to be addressed in the design.

Team Members: Sydney Yeh, Mejak Jones, Teagan Mach, Yifan Lin, Kiswa Rahman
Co-Designer: Diana Zwelling

We are aiming to create a mechanical design that provides both comfort and the ability to control for the patient to feed herself. We are approaching the design by dividing it into two parts - forearm and upper arm. The reason for this approach being that these two parts of the arm require different degrees of movement. We are building our design off of existing designs for patients that require mobile arm support, but modifying it to satisfy our specific patient’s needs and constraints. In terms of testing, we are looking to use a combination of 3D printed parts as well as purchased parts (loc line, clamps, and adjustable angle lock) to evaluate the feasibility of our design. We will also be updating our clinician regarding our progress and make adjustments based on her feedback.

Design Sketches

Hinge and support pieces designed in SolidWorks
Tremor Reduction

Enabling tremor sufferers to eat food independently and easily. Focus on creating a product that lessens the amount of spills and messes that the user experiences while eating, while maintaining a streamlined look that blends in with other utensils and foodware.
**Tremor Reduction**
People with essential tremor have difficulty with independence, especially eating: from holding utensils to drinking from an open glass. One current solution is weighted utensils, however, many people report that this does not help and may be even less helpful for people with more extreme tremors. Another current solution is Liftware utensils. While they seem to work, they can be very expensive. Our goal is to design a tool or device that can diminish the effects of essential tremors and is relatively inexpensive to produce.

**Team Members:** Nick Roberts, Brandon Joannes, Sara Schultz, Soumya Jindal, Jan Silva, Jonathan Walzer  
**Co-Designer:** Allie Fee

Our design is an attachment piece that adapts to current utensils instead of a standalone device. Our initial prototype will primarily focuses on the utilization of spoons by implementing a rotating, retractable lid that will allow users to push down on a lever to “capture” food on their spoon. The rotation of the lid acts similar to that of an ice-cream scooper where pushing on a spring-loaded lever located on the handle attachment will cause the lid to move 90 degrees from the edge of the spoon to directly above it. For further prototyping, we plan to design a lever for easier handling and use, reduce the overall size of the attachment, and perform initial testing with our co-designer.

**Brainstorming design concepts and sketches.**

**Spoon enclosure attachment piece designed in Fusion 360 and 3D printed.**
Gait-Training Walker

Properly align joints of a baby using a Gait Walker to increase early age glutes/hip girdle muscle development and to increase spatial awareness essential for later childhood progression.
Gait-Training Walker
Some children need extra support when walking, but many commercial 4-wheeled walkers, bouncers, and exersaucers instruct plantarflexed (toe-walking) positions which leads to poor lower-leg strength development and improper coordination patterns. Our goal is to design a walker with a tray that will promote proper gait development. A new design could also help save money for families that often have to buy medically-based walkers and give physical therapists an easily-available resource.

**Team Members:** Cameron Fahsholtz, Michael Troska, Benneth Salanga, Melissa Guadarrama, Melissa Tran
**Co-Designer:** Kelsey Daniels

Our design alters the positioning and support of existing walkers to better develop a child’s walking dynamics. For initial prototyping, we are utilizing a life-jacket to act as a harness and a foam back support for positioning.

*Back support designed in SolidWorks*

*Lifejacket and back support piece implementation on an existing walker*
EasyTech

Developing tools and apps to ease the usage of existing devices for patients with myotubular myopathy to improve control for skills such as typing and playing games.
EasyTech
People with neuromuscular disorders may not be able to access all of the tools of technology with a traditional keyboard and mouse. Our goal is to help an individual in our community with myotubular myopathy by implementing new methods for accessing and using different devices. A new design has the potential to improve skills such as writing and playing games.

**Team Members:** Erin Rochfort, Annie Liu, Jaimie Jin, Frederick Huyan, Srinithi Latha
**Co-Designer:** Douglas Allison

We aim to create a tablet case that will allow our user to navigate both typing and touchpad navigation with one hand. Our low fidelity design is composed of a case where the tablet will sit flesh with the case. There is a lowered section of the case where an overlay will sit. This overlay will allow for two things: typing with penti (designating finger holes for our user) and typing. Our design will allow our user to switch between the two modes with a swiping motion. The overlay will be kept in place by the lowered edges of the case. Our main goal is to ensure that our user can access both keyboard and touchpad capabilities independently.

*Concept design sketch*

*Tablet platform designed in SolidWorks.*