

Introduction (Elsa and Tahmeed)

- 1. Explain why the problem is important (“So What?”). This will require some research and rehearsal. You need to be very crisp and clear about what problem you have solved and what work you have done.**

Good afternoon, we are Breakthrough Solutions and we will be presenting the remote braking system. In Canada alone, over 1.1 million people are using walking aids. Unfortunately, next to none of these walking aids include remote braking systems. Consequently the users must rely on their caretakers or guardians to manually engage their brakes which could be potentially dangerous in emergency situations.

- 2. Explain the basic user requirements and why solving the problem is important (“Who Cares?”), as well as current solutions and alternatives and introduction.**

Our client has a 7-year-old son with cerebral palsy who has difficulty with developing motor skills and coordination. So our client brought and modified a gait trainer to help his son learn how to walk independently. Now, the client wishes for a removable, compact braking system that allows him to stop the trainer remotely so that his son is safe from harm’s way. Our client asked for a remote that varies the force of the braking depending on how hard you press on it. However, there are very few gait trainer braking systems available on the market, and none of them activate remotely. And that’s what BRAKEthrough solutions aims to address.

- 3. Explain the differentiation in your design or the key aspects that make your product better than other solutions on the market (“Why you?”). Also, explain the product.**

Our solution is the only remote braking tool designed specifically for gait trainers on the market. Compared to other manual braking systems for gait trainers, we have the remote control ability, allowing for the user of the trainer to have more independence of control while also staying safe from hazards as they learn to walk. The product combines a pressure-sensitive controller (with 4 braking speeds) with an actuator based friction mechanism with a bluetooth communication system. In ideal conditions, the transmission speed of the controller to the braking system is less than a tenth of a second, and the transmission distance is up to 20 m!

When we first approached this project, our main goal was to design and manufacture a safe, simple, and effective solution. To achieve this we have built a brake that can be activated with just the push of a button. Furthermore our design applies force directly to the wheel of the gait trainer, eliminating any complex subsystems, reducing the chance of mechanical failure. Lastly, any components that experience a large torque have been machined out of aluminum, with some small steel parts. This keeps the brake lightweight at only 30% of the trainer's own weight, and also prevents it from deforming under strain, making sure the user comes to a safe and gentle halt with every use.

Live demo

Conclusion

In conclusion, our remote braking system is unique in what it provides to children using gait trainers. Most importantly, It balances independence with safety. Thank you for listening!