

# THE WALK-A-ROUND

A standing and walking assistance device designed and manufactured for a client that suffers from ataxia and a previous stroke.

## PROJECT GOALS

The Walk Around was a project brought to the attention of the capstone department by the client. The client had a previous stroke and is now left with limited mobility and suffers from ataxia. Ataxia causes people to lose muscle control in their arms and legs. Since the client's stroke, they have struggled to find a product currently on the market to suit their physical needs. The goal of the project was to develop a product that better suits the client's needs to increase their mobility and independence. The client hoped to be able to go outside unassisted, take their dog outside, do dishes, and much more. The goal of the team was to produce a walking assistance product that fulfills all of client's physical needs.

### Customer Requirements:

- The device needed to fully surround the client.
- The device needed wheels that braked.
- Brake controls needed to be simple in use and easy to operate.
- A seat was needed to transfer into the device and for support if needed.
- It needed to be able to be used outdoors.
- The device needed to be easily maneuverable around the client's house.
- Full 360° rotation needed for front wheels.
- Device needed to fully support the client's weight and not fail in any normal use scenario.
- The device needed to be able to sit flush with the edge of a counter.



## DESIGN PROCESS

In order to produce a final device for the Walk-a-Round a lengthy design process was conducted. The team began the process by conducting research into on the market products. This helped the team see what worked and what wouldn't work for the clients needs. Then the team dived into concept generation by sketching out ideas which were analyzed using a go-no-go matrix. This helped the team decide on the best concept. The decided upon concept was made into a prototype. A life size prototype was made to help the team get a better sense of the sizing of the device and the flaws that would need to be fixed.

After the prototyping phase the team was able to improve upon the final design and make CAD. The CAD and final design were used to begin the manufacturing process.

## MANUFACTURING

The team worked together to manufacture the device. Work was done in the OSU Rogers machine shop and assembly room. Normal tools, a lathe, an end mill, and cold saw were used throughout the process. All of the manufacturing was completed by the team and split evenly between all members.

### Materials Used:

- Aluminum piping
- Galvanized steel structural support fittings
- Treated wood seat base
- On the market walker wheels and brakes

## DEVICE DETAILS

In order to fulfill the customer requirements many different design factors were taken into consideration. The final design was made up on specific components to ensure that the clients needs were met. These specific components are listed here.

- A transfer seat to allow easy access into the device from a seated position in a wheelchair.
- A gate that allows the client to be fully surrounded once in the device and able to easily access the device.
- A swiveling upper support to ensure the client can easily stand and support themselves under their arms. Along with a locking system to secure the swiveling arm.
- A rigid frame that can support the weight of the client.
- Handle and brake system to assist during transferring into and out of the device.
- Safety strap to guide the user back to the seat in case of a fall.
- Flat front frame to ensure the device can come close to a counter.
- Dog leash mount.

