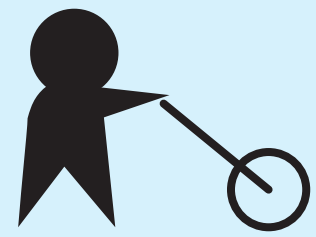
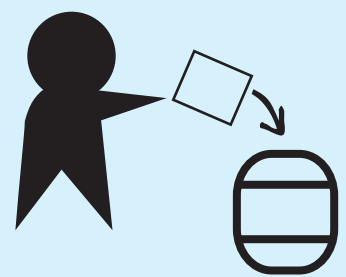


# Mpumalanga H2O

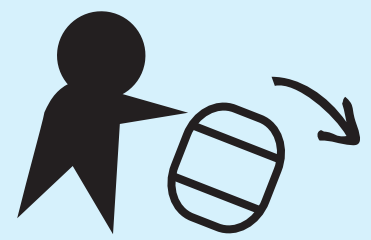
## Collection Process



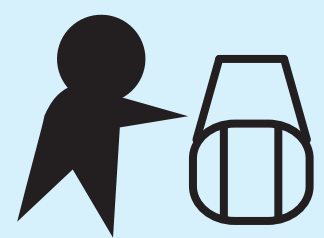
Push empty barrel roller to water source



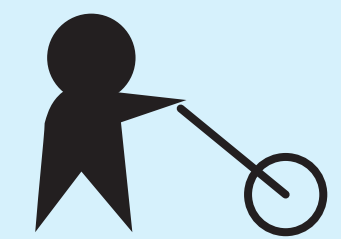
Fill barrel from water source



Once full, push the barrel onto it's side



Attach the pushing/pulling handle



Push full barrel roller home



Stand/Empty up barrel

## Objective

Design a hand operated mechanical device for moving  $\geq 40$  liters of water per person per day from a distance of  $\geq .5$  km for a community of 12000 households located in 21 disperse locations in Mpumalanga, South Africa.

## Facts

Mpumalanga, South Africa  
Population: 140,000 - Elevation: 1791 ft. 248 sq. miles

Rural poverty has worsened in recent decades as a result of globalization, the commercialization of agriculture, land use changes, degradation, climate variability, and increasing levels of urban migration.

The Hippo Roller provided an easier solution to water collection to fulfill each household's need of 40 liters per day for each family member.

16,000 Hippo Rollers have been distributed in the past 16 years at a cost of \$90 each. Much of the cost is a result of "shipping air".

## Problem

The current Hippo Roller does not address the potential for musculoskeletal strain given the duration and frequency of its use.

## Solution

Inspired by flexible straws and collapsible buckets, I created a collapsible barrel, made from Rhodorsil silicone, modeled after the original Hippo Roller.

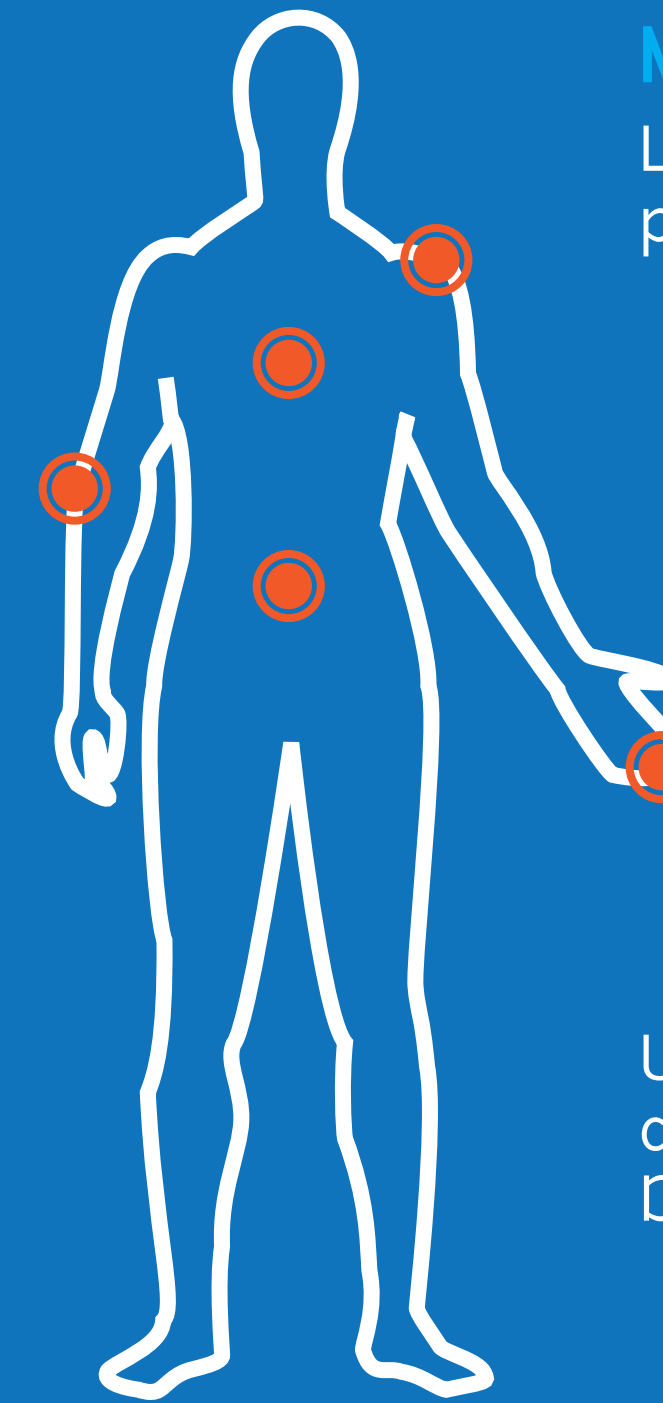
## Solution Benefits

- Collapsible silicone frame for cost effective shipping
- Holds 45 liters of water to decrease weight
- Molded handels for easy expansion and carrying
- Bar attachment with larger diameter handle
- Oversized cap

## Musculoskeletal Risk Factors

Lifting, pushing, and pulling can result in back pain and musculoskeletal injuries and disorders:

- Lower Back Pain
- Erector Spinae Muscles
- Shoulder Pain
- Elbow Pain

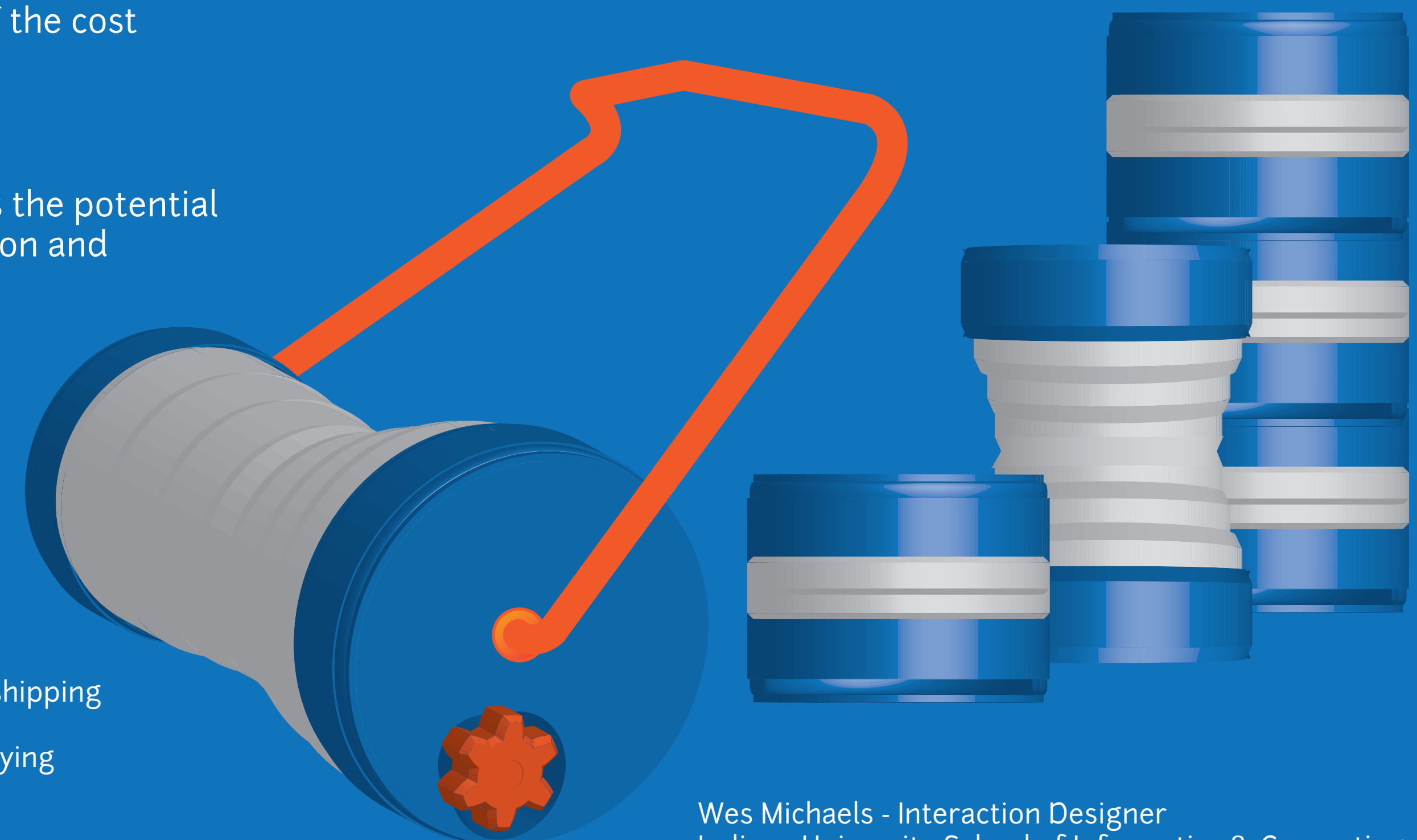


Forcful gripping of tools with small diameter handles can produce localized pressure on the underlying tendons in the fingers, resulting tenosynovitis and related disorders.

Using tools that utilize the fingers and hands can cause Upper Extremity Cumulative Trauma Disorders such as:

- Inflammation of Joints, Muscles, and Tendons
- Disease of the Peripheral Nerves

**REPEAT  
3X  
DAILY**



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