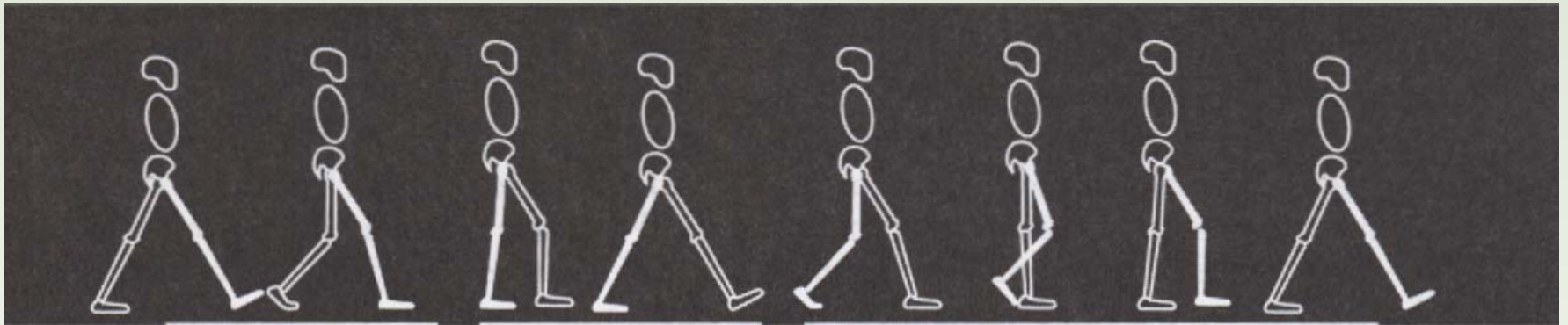


# Let's Get Physical!

## Pediatric Gait Project

Nydia Cardenas, Whitney King,  
Roseanne Warren



# Problem

Children who require physical therapy or gait training to improve their ability to walk do not spend sufficient time with a physical therapist to master this skill.

# Goal

Design a device that

- 1) appeals to children
- 2) is portable and easy to use at home
- 3) encourages walking with proper gait

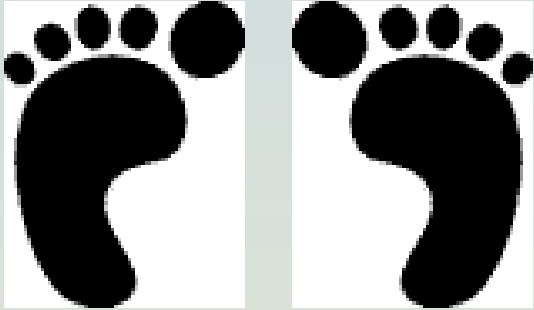
# User Acceptance: Design for Children

- i) Rapid pace of development
- ii) Children not purchasers
- iii) Observations most valuable
- iv) Physical therapy exercises: integrate vs. alienate



# Design Concepts

## i) Standing/Balancing Aid



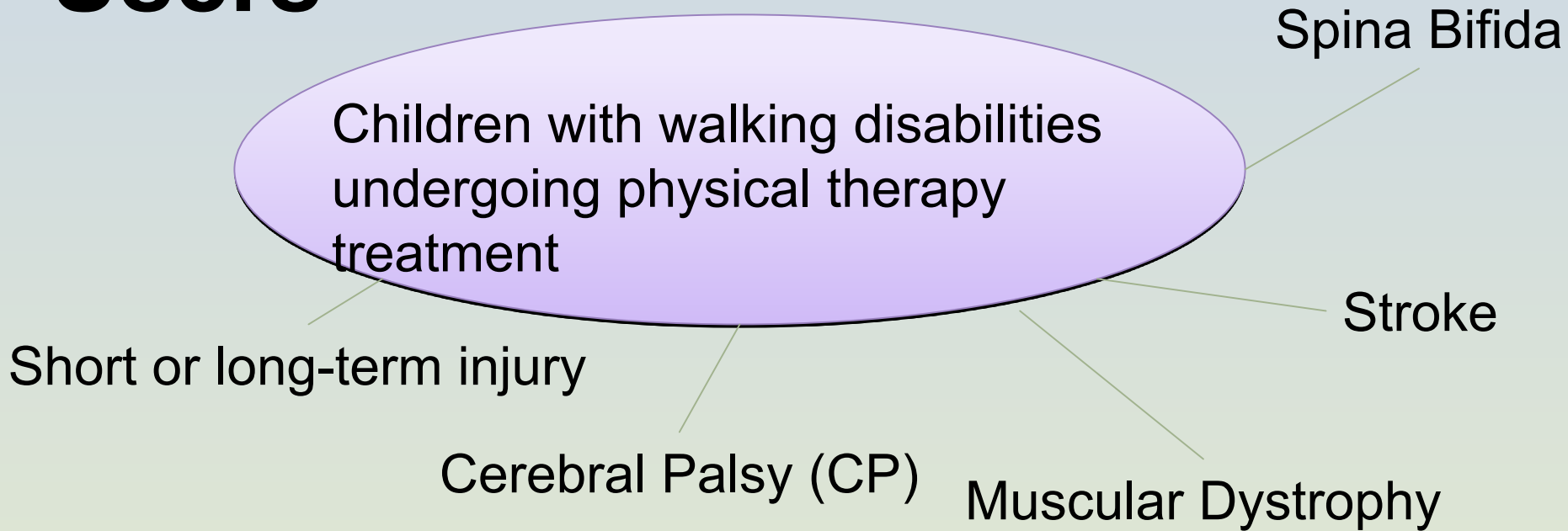
Plays music if user exerts an equal amount of force on both legs



## ii) Stable Bike Peddler with Hand Controls

## iii) The DJ: Walking Motivator

# Users



Lucile Packard  
Children's Hospital  
AT STANFORD



# Existing Solutions

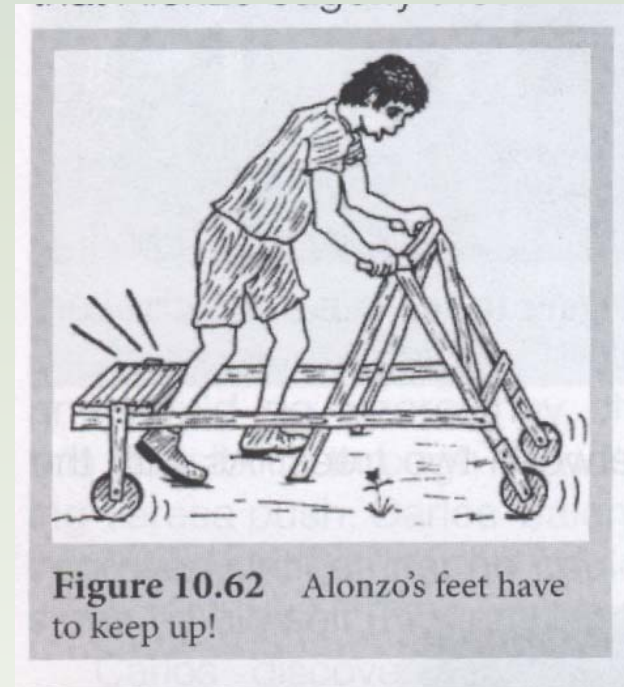
i) Gait Trainer ii) Steady-stepper



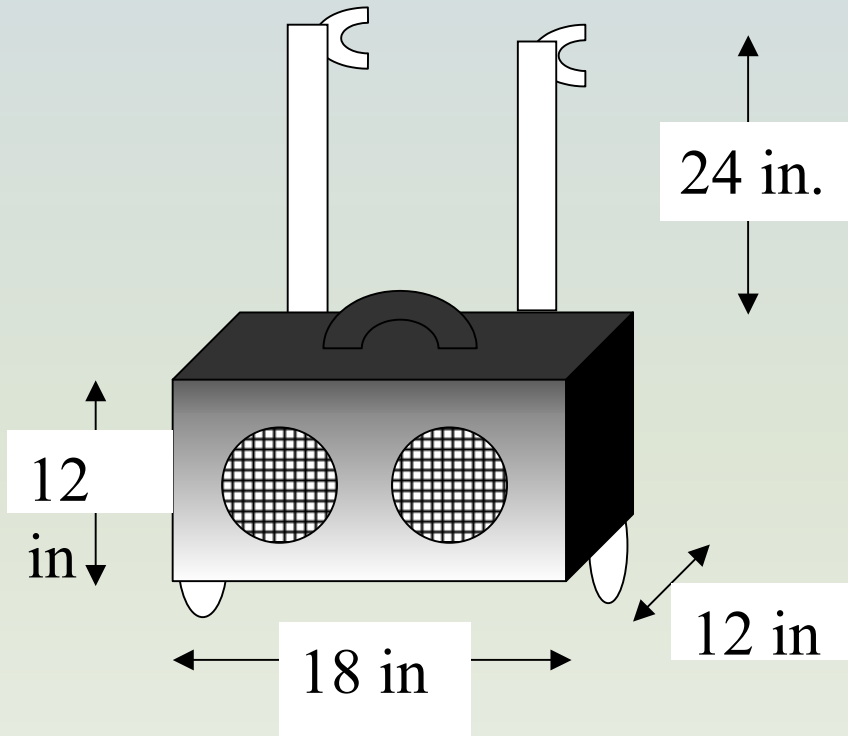
iii) Walking Motivator



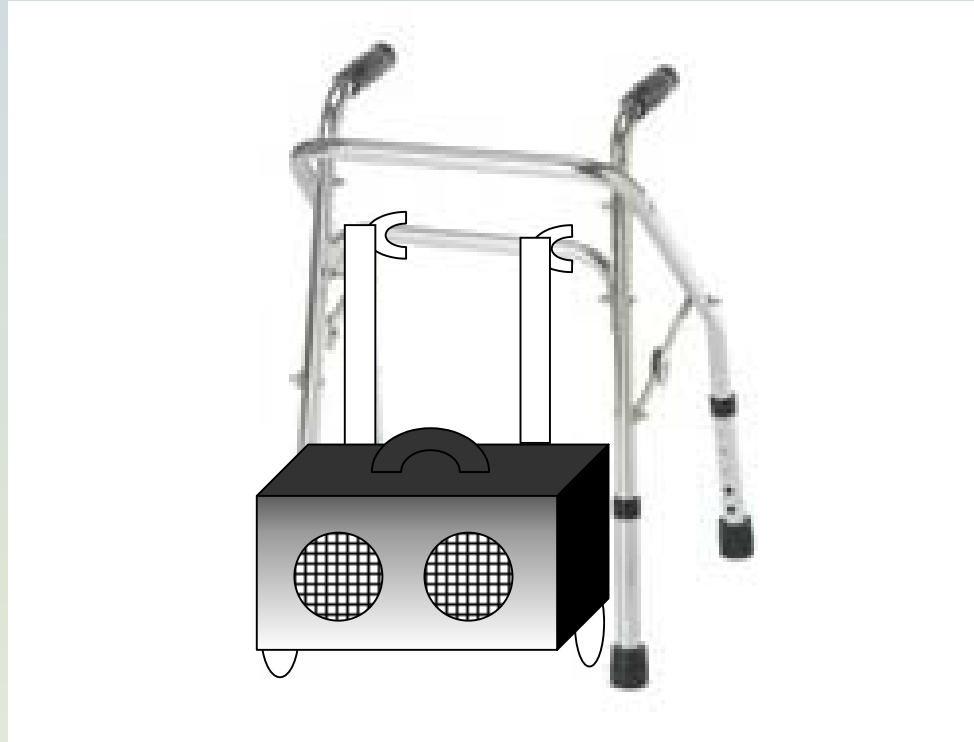
iv) "Alonzo & Polo" Walker



# The DJ



- Small size
- Has a handle for carrying
- Two push handles for better weight support
- Might pursue telescoping poles as push handles to adapt to various users and make it more practical to carry



Can also attach to a walker



# The DJ: Electrical Design Ideas

- The Dynamo



- The dynamo uses rotating coils of wire and magnetic fields to convert mechanical rotation into a pulsing direct electric current.

# The DJ: Electrical Design Ideas

- **The Microprocessor**



- Input and output devices may be discrete switches, relays, or solenoids. Used to control electric motors, relays or voltages, and may read switches, variable resistors or other electronic devices

# The DJ: Electrical Design Ideas

- **Accelerometer**

A device for measuring the total specific external force on the sensor

- **Relays and Generators**



An electrical switch that opens and closes. A closed switch would complete the circuit and allow music to play.

# Looking further...

## PROS

- “Popular” music and not mechanical music
- Universal: would entice children without a disability
- Portable
- Can push by hand or by attaching to walker (various levels of users)
- “Cool” factor

## CONS

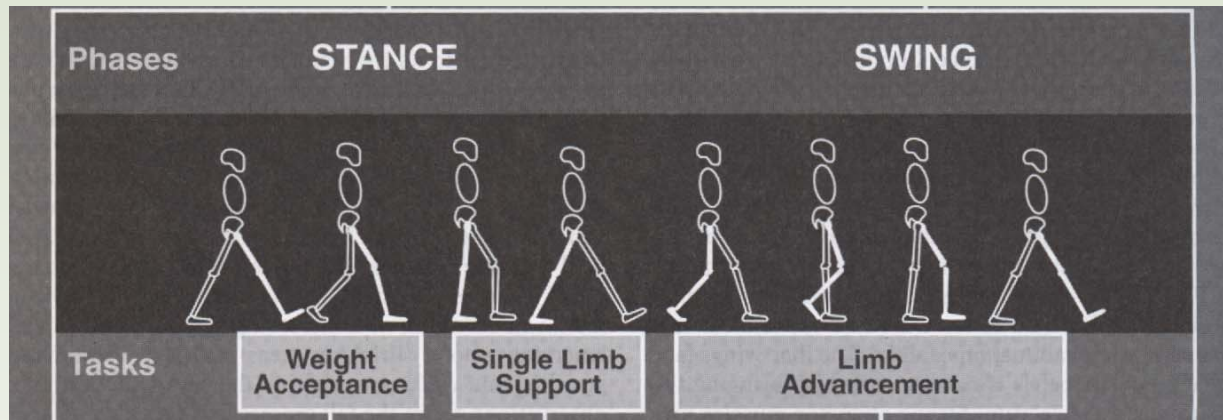
- Does not address issue of poor gait
- Could get annoying for parents (key supporters)
- When would it become old?

# From Debbie Kenney ...

- Training for devices is key or success level low
  - Little training required for The DJ
- Repetition is key
  - Already primary idea behind design
  - Portable entertainment and exercise

# Future Work

- i) Users!
- ii) Improve sound design and music playing capabilities
- iii) Incorporate Gait Analysis



# Project Timeline

