Let’s Get Physical!
Pediatric Gait Project

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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

Children with walking disabilities undergoing physical therapy treatment

- Spina Bifida
- Stroke
- Short or long-term injury
- Cerebral Palsy (CP)
- Muscular Dystrophy

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.
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
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<tr>
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<td>Solidworks Drawing of Device</td>
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<tr>
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**EXPE project Expo** is a significant milestone that occurs between 5/30/08 and 6/5/08.