Fourier M2: Upper Limb Rehabilitation Robot

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Background Information

• Based in Shanghai, China
• Currently only M2 robot in all of North America
• Upper extremity robotic using interactive reward-based games in order to motivate patient to complete task-orientated movements
• Real-time feedback
• Provides objective data
Populations & Diagnosis

- Stroke
- Spinal cord injury
- Traumatic Brain Injury
- Multiple sclerosis
- Other Neurologic
- Lung transplant
- General debility
Impairments

We Have Used the M2 to Address:

- Upper extremity neuromuscular re-education
- Strengthening
- Activity tolerance
- Core stabilization
- Visual tracking
- Visual perception
- Attention
- Midline orientation
- Problem solving
- Motor planning
Training Modes

• Guiding patient through stages of recovery with four modes:
  1. Passive
  2. Assistive
  3. Active
  4. Resistive
Training Modes

1. Passive
2. Assistive
   - Aids patient with completing movement
   - Can adjust level of assist to how quickly/how much assistance robot is providing
   - Provides percentage on how much the patient is actively participating
3. Active
   - Use of patient’s active range of motion to obtain targets
   - Additional game requires problem solving and motor planning to go around wall to obtain target
4. Resistive
   - Applies resistive force for strengthening
   - Inertia level for improving coordination and motor control
Adjustments

• Velocity
• Range of Motion Size
• Trajectory
• Assistive/Resistance Force
Graphics
Safety & Additional Features

• Built-in spasm detection
• Emergency stop button
• Adjustable height table
  – Can complete at seated or standing level
Documentation

• Bar & line graphs
• Total time completed
• Energy Expenditure
• Additional notes
Modifications

• Positioning
  – Seated
  – Standing

• Additional Equipment
  – Dyna disc
  – Airex/ balance pad
  – Bosu ball

• Trunk flexion/extension
• Bilateral upper extremity use
Thank you for your time

Questions?