



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?