

Team 10 - At-Home Physical Therapy Device for Hemiplegic Patients

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NEED

Hemiplegia is paralysis of one side of the body. Over 477,000 patients affected annually



Physical therapy (PT) retains and improves function
PT can cost \$50,000+/yr
Low compliance with at-home PT → reduced hand function

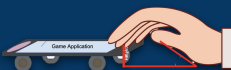
OBJECTIVE



Engage users in consistent, independent practice of hand extension/flexion exercise

KEY REQUIREMENTS

- R/L Hand Compatibility
- Wrist Angle Position: 10-30°
- Maximum Force to Move Device: 10.9N



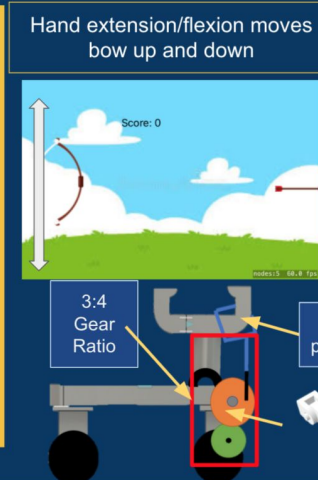
KEY CONSTRAINT

- User Hand Range of Motion (ROM)
- Physician Request for Phone Application

DESIGN AND BUILD



Bow at Top of Screen
Bow in Center Screen
Bow at Bottom of Screen



*All prototypes passed all verification tests

VERIFICATION

Requirement	Results for Prototype 2
Wrist Angle: 10-30°	Angle during use (N=8) 17.8°±1.2°
Max. Force to Move < 10.9N	Pulley Test (N=15) 0.43±0.23N
Cost Reduction > 80% (from \$350-\$1000)	Cost reduction: 95-98.5%

IMPACT AND FUTURE DIRECTIONS

1. Improve quality of life and medical outcome of users from increased PT compliance.
2. Expand applicable PT uses of the system (burn victims/hand orthopedic surgery recovery)