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

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**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

**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

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**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)

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**VERIFICATION**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Results for Prototype 2</th>
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<tbody>
<tr>
<td>Wrist Angle: 10-30°</td>
<td>Angle during use (N=8) 17.8°±1.2°</td>
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<tr>
<td>Max. Force to Move &lt; 10.9N</td>
<td>Pulley Test (N=15) 0.43±0.23N</td>
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<td>Cost Reduction &gt; 80% (from $350-$1000)</td>
<td>Cost reduction: 95-98.5%</td>
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*All prototypes passed all verification tests*