## Medical Need

**Non-Weight Bearing Injuries in Patients 50+**

1. **FOOT DEFICIT FROM DIABETES**
   - 50% of 50+ diabetic patients

2. **ANKLE FRACTURE/SPRAIN**
   - 680,000 patients between 2012 - 2016

3. **ACHILLES TENDON TEAR**
   - 106 per 100,000 patients

## Best Current Solution

**Kneeler Limitations**

- Lack of hip mobility
- Lack of padding = discomfort & pain
- No normal hip ROM

## Objective

Design an assistive walking device for patients over the age of 50 with the aforementioned non-weight-bearing injuries that allows the user to maintain normal controlled mobility.

## Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1 Load</td>
<td>230.4 lbs</td>
</tr>
<tr>
<td>R2 Pressure</td>
<td>&lt; 0.242 MPa</td>
</tr>
<tr>
<td>R3 ROM</td>
<td>40° Total ROM</td>
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</tbody>
</table>

## Design

**Final Design**

- curved rails
- more support under cushion
- different material than T-bars

## In Use

- Non-weight-bearing capabilities
- Maintain mobility while walking
- Assist ~14 million patients/year

## Results

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1 Load</td>
<td>Hook Tensile</td>
</tr>
<tr>
<td>R2 Pressure</td>
<td>Pressure Distribution</td>
</tr>
<tr>
<td>R3 ROM</td>
<td>Gait Analysis</td>
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</tbody>
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