Assistive Transfer Device

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PROBLEM STATEMENT

- Safely transfer patients from wheel chair to exam table
- Patients should feel secure while lifted
- Reduce Physical exertion of both patient and medical personnel
CURRENT LIFTING METHODS

- **Manual Labor**
  - **Method**
    - Medical assistant wraps arms around patient
    - Holds patient while slowly rotating toward table
    - Hoists patient onto exam table
  - **Risks**
    - Large effort from assistant
    - Uncomfortable for patient and assistant
    - Dependent on assistant strength

- **Hoyer Lift**
  - Mostly for Wheelchair-bound patients
  - Have to get sleeve underneath patient
SPECIFICATIONS

- Able to lift 300 lbs.
  - (Safety factor of 2)
- Lift 10-15 in.
- Rotate Patient
- Portable
  - (Device < 50 lbs. or on wheels)
- Easy Storage
  - Fits into small spaces
- Stable during operation
Successes

- Can lift up to 300 lbs
- Initial step height is $2 \frac{1}{8}$ in.
- Stable during ascent and descent
- Can operate automatically
- Everything fits within frame

Areas for Improvement

- Support mechanism for patients
  - walker, railing, etc.
- Increase ease of storage
- Improve ergonomics
IMPROVEMENTS

- **Structural**
  - Thrust bearings for driveshaft
  - Supports for top frame
Design Requirements

- Stable, promotes patient comfort
- Easy to store
- Simple assembly
### Frame Designs

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<tr>
<th></th>
<th>Stability</th>
<th>Storage</th>
<th>Patient Comfort</th>
<th>Cost</th>
<th>Adaptability to Current Devices</th>
<th>Ease of Operation</th>
<th>Feasibility</th>
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PROPOSED DESIGN

Operational Position

Collapsed support rails (top view)

Collapsed support rails (side view)
Target population: Individuals older than 65 yrs

Parameters for device
- Maximum step height
- Stance Width

Survey for study subjects
- Test different step heights
- Measure stance widths
- Rate on comfort/difficulty

Health Science (Minimal Risk) IRB Approval
FUTURE WORK

- Parameter research
  - Build test boxes
- Fabrication
- Validation of final design
DOES ANYONE HAVE ANY QUESTIONS?
REFERENCES


