

Assistive Transfer Device Product Design Specification (PDS)

5/03/11

Luisa Meyer, Scott Sokn

Function: Develop an assistive device to safely transfer patients from the floor to a level at which they can easily sit on exam tables. Patients will be able to stand and hold onto the device while simultaneously being lifted and rotated into position on the exam table. The design will reduce physical exertion by the patient and medical personnel.

Client requirements:

- Small base , able to fit through door-way / easy storage
- Able to lift 300lbs
- Simple to operate; automated or manual
- Easy to sterilize
- Mobile in clinical setting
- Avoid in-air suspension of patient
- Cost-effective
- Reduce patient anxiety during transfer

Design requirements:

1. Physical and Operational Characteristics

- a. *Performance requirements:*
 - i. 3-5 minutes per lift
 - ii. 5-10 cycles per day
 - iii. Handle loads up to 300 lbs
 - iv. Lift to height of 15 in
 - v. Rotate patient 90°
- b. *Safety:*
 - i. Safety factor of 2 – hold 600 lbs
 - ii. Few pinch points
 - iii. Stable
 - iv. Slow, constant raising and lowering rates
 - v. Lockable turntable
 - vi. Attachable walker for support
- c. *Accuracy and Reliability*
 - i. Consistent performance
 - ii. Does not let patient slip, tip, or fall
- d. *Life in Service:*
 - i. 10 years
 - ii. Approximately 50,000 cycles

- e. *Shelf Life:*
 - i. Oil joints
 - ii. Motor maintenance
 - iii. Non-corrosive
- f. *Operating Environment:*
 - i. Room temperature
 - ii. Used by nurses
 - iii. Possible human fluids
 - iv. Impact resistance
- g. *Ergonomics:*
 - i. Intuitive use/interface
 - ii. Patient comfort
 - iii. Non-abrasive materials
 - iv. Minimal operator effort (<50 lbs)
- h. *Size:*
 - i. Less than 3 ft wide (approximately 25 x 28 in)
 - ii. Less than 4 in height when compressed (initial step height)
- i. *Weight:*
 - i. Able to be moved on wheels
 - ii. Less than 50 lbs
- j. *Materials:*
 - i. Prototype – Steel, Aluminum frame
 - ii. Wheels
 - iii. Electric jack
 - iv. Polymers – acrylic, Plexiglas
- k. *Aesthetics, appearance, and finish:*
 - i. Paint – Blue
 - ii. Safe appearance

2. Production Characteristics

- a. *Quantity:*
 - i. *One prototype this semester*
- b. *Target Product Cost:*
 - i. Less than \$500

3. Miscellaneous

- a. *Standards and Specifications:* FDA approval, IRB review board
- b. *Customer:* Hospitals, clinics, nursing homes
- c. *Patient-related concerns:* Elderly, frail patients, amputees
- d. *Competition:*
 - i. Hoyer Lifts
 - ii. EZ way
 - iii. Litegait
 - iv. Lift tables