

OEM Contract Innovation, Design & Manufacturing Motorized Bed Mover



Statistics compiled by the US Department of Labor indicated that direct and indirect costs associated with back injuries in the healthcare industry are estimated to be \$20 billion annually. Nursing aides and orderlies suffer the highest prevalence (18.8%) and report the most annual cases (269,000) of work-related back pain among female workers in the United States.

When it comes to the forces required to move equipment in hospitals, beds with patients are among the highest. Add inclines and carpeting on the floor and the risk of employee injuries caused by excessive push/pull forces is a serious concern. With the continuing obesity problem, the average weight of patients is rising which only increases these forces.

That is why when a major manufacturer of bariatric hospital beds came to us to investigate a motorized solution, we decided to help with a customized ergonomic solution.

The project started when our engineering team collaborated with their marketing, quality and engineering personnel to develop concepts for a motorized solution that would meet their requirements. Jointly we developed a detailed product specification that identified some of the unique challenges to motorize the movement of a bariatric

bed around a hospital facility including:

- Safe, yet simple connection to the bed.
- Provide enough power to move the fully loaded bed, 1800 pounds, up and down an ADA compliant incline without assistance from caregiver. Some of the existing solutions did not have the power to move a loaded bed up an incline without assistance from the caregiver.
- Minimal added length when connected to the bed so that it would be able to load into any hospital elevator.
- Easy to use hand controls.
- Meeting cost and project budget projections.

Once the detailed product specifications were defined, reviewed and approved by the customer, the project moved forward into the innovation and design phase. Periodic design reviews were held to evaluate progress and to affirm the direction of the design.

Inclusive within the design process, prototypes were built and evaluated by the OEM customers. Critical feedback from these trials were evaluated and led to

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changes in the design, one being a unique adjustable mast and user interface control. The final design has a mast and control that can be independently adjusted by the user to provide a comfortable and ergonomic position for a wide range of user heights.

Another challenge was traction. Without it, the power of the heavy duty drive system would result in the wheels spinning and the bed not moving. This design challenge was overcome by transferring some of the load of the bed directly to the mover. A holding trough, lined with a scuff resistant plastic was designed to fit the bed frame. This feature also allowed the mover to be securely attached to the hospital bed throughout the entire transport process including inclines.



Industrial Designers worked with the OEM customer to develop the look and feel of the plastic cover to match their corporate branding requirements. The cover needed to sustain this look throughout the life of unit while enduring the rigors of a hospital environment. To find a solution, the design team turned to a high impact plastic material using a rotomolding process. Finally product labeling, branding and colors were matched to the exact corporate requirements of the OEM customer.

After a pilot run, the unit was released into manufacturing using a modular, mobile cell based manufacturing concept.

With the introduction of the motorized bed mover, hospitals that incorporate this product as part of their Safe Patient Handling programs are helping to reduce the number of work related MSD injuries in their facilities. Not only are they helping their work force, but with reduced workers compensation claims, they are helping to increase their bottom line performance as well.

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