

Our Client and The Dual Problem

Our client is St. Margaret's Nursing Home in New Orleans, LA. During a hurricane evacuation, the nursing home moves their patients to a church gymnasium in Jackson, MS. Their current plan involves trundle beds that are stored on site and set up by church volunteers with some of the St. Margaret's staff. However, these trundle beds are plagued by many different problems.

Our task was two-fold: develop an interim modification of the current trundle beds to improve their safety and stability, providing a low-cost preliminary solution. In addition, we aimed to propose a new product to solve their demonstrated needs.

ST MARGARET'S



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Evacuation Cot

**Improve and develop a
solution for temporary beds
for use by a nursing home
during an evacuation.**



Team MegaPascal – Evacuation Cot

The Problem

The nursing home currently uses a very basic, temporary and semi-collapsible trundle bed. The primary issue with the trundle beds is the stability. Problems arose when the patient was transferred into or out of the bed and during independent patient movement while in the bed. The legs collapsed by folding in on themselves and the entire bed rolled over very easily. The client also re-



quested a side support that patients could use to stabilize themselves as they adjusted in the bed. Another issue is the back strain experienced by staff members when tending to the patients as the cots are

very low to the ground. A portion of the patients use feeding tubes, which requires the head of their beds to be raised.

The Goal

- Improve the current trundle bed with simple modifications to better meet the functional requirements of the client
- Provide a customized new commercial product that better satisfies the functional requirements of the client.

Functional Requirements:

The functional requirements were established and ranked based on importance with the primary requirements in Tier One.

Tier 1: Stability during normal operations and loading

1. Support weight up to 350lbs
2. Able to sustain a wide range of patient motion and positions during transfer
3. Adjustable to 45° incline
4. Suitable height for both patient and staff
5. Removable side support and boundary

Tier 2: Ease of storage and set up

1. Easily assembled by one or two people
2. Minimize required storage space
2. Durable and reusable

Tier 3: Sleeping surface must meet patient standards

1. Satisfactory comfort and sanitary needs
2. Anchored mattress
3. Minimal pressure exertion (a mattress that slopes at the foot is ideal per client suggestions)

The Current Bed

Stability was the major concern in modifying the current cot. The casters located in the center of the bed along with the U-shaped legs allowed the bed to easily roll. The casters were removed and replaced with wooden studs. Studs were also bolted to the collapsible legs. The added weight and support dramatically improved the stability of the unit. Cords fastened the legs to the frame which keeps them from collapsing from typical use.



The New Product

The Deluxe Surge Cot #4 by ARC Products from MedSled is wheelchair height and has a head elevator that encompasses a wide range of angles. The legs on either end can be locked and additional leg members help stabilize the frame. Product features satisfy the core functional requirements, but further modifications are made to enhance safety and ease of use, including construction of aluminum rails and a controlled release mechanism for the head-prop. Not only do these additional components increase patient and staff safety, but are detachable and do not detract from the physical integrity of the cot.

