Boston Medical Center, Boston, Massachusetts

A successful redesign and standardization of BMC's adult emergency cart

Exceptional care. Without exception.

Avalo® Series Emergency Medical Cart

Facility Overview

Boston Medical Center (BMC) is a private, not-for-profit, 567-bed, academic medical center located in Boston's historic South End. The primary teaching affiliate for Boston University School of Medicine, BMC is the largest safety net hospital and busiest trauma and emergency services center in New England.

Focusing strongly on urban health, Boston Medical Center is a founder of Boston HealthNet, a network affiliation of the medical center, Boston University School of Medicine, and 14 community health centers. Established in 1995, Boston HealthNet is an integrated health care delivery system whose partners provide outreach, prevention, primary care and specialty care, and dental services at sites located throughout Boston and in nearby communities.

As the principal teaching affiliate of Boston University School of Medicine, BMC is devoted to training future generations of health care professionals. BMC operates 66 residency training programs with 817 resident and fellowship positions.

The Challenge

In 2016, Boston Medical Center was using 25–35 year-old code (emergency) carts from several different facilities that were merging into a new hospital campus. The mix of carts differed in height, appearance, access and maneuverability. In constant need of repair, they no longer met BMC's workflow needs. As part of the new hospital campus development and clinical campus redesign, BMC recognized the need for newly designed code carts.

The Solution

BMC initiated a quality improvement project to identify common issues with its current carts and to evaluate design solutions for standardizing new code carts, focusing on usability and patient safety.

A Code Committee was established with members that included nurses, physicians, pharmacists, respiratory therapists, purchasing, and administrators. The Code Committee's survey of the nursing staff uncovered three primary challenges: cluttered carts, difficulty locating stock, and inconsistent cart access.

The Code Committee identified and tested two different crash carts: one metal and one HDPE plastic. The project involved a multi-phase approach including user surveys, usability testing, feedback and redesign.

The two cart platforms were evaluated for the following factors:

- **Maneuverability** – lightweight, easy to move, smooth rolling lockable casters
- **Functionality** – drawer design for workflow needs, orderly storage for supplies and medications
- **Durability** – constructed to last
- **Stability** – designed for stable maneuverability
- **Secure Access** – security for medications with quick access
- **User-Friendly Design** – cart aesthetics and ergonomics, flexible organization, drawer dividers, and drawer labeling

The last factor – user-friendly design – was the strongest consideration. Users had to quickly and easily identify critical medications and supplies. The placement of accessories were considered to ensure they provided an ergonomic workspace and improved functionality. Cart height, weight, and movement had to accommodate all staff members. Lastly, cart security was tested to ensure medications were secure, but quickly accessible for timely code response.

Results and Benefits

Following the Code Committee's cart evaluation, nurse testing and feedback, Boston Medical Center chose the Avalo Emergency Cart from Capsa Healthcare.

The Code Committee highlighted these findings in choosing the Avalo Cart:

Design: The Avalo drawers are carefully designed with a selection of drawer depths and dividers to provide optimal visibility, grouping and organization of medications and supplies. Placement of accessories including the sharps container, oxygen tank, and writing shelf provide an ergonomic workspace. The swiveling defibrillator tray enables clinicians to keep a clean workspace on the cart top.

Functionality: Drawers open fully allowing access to contents in the rear, and remain closed when the cart is in motion. Labels on the front clearly identify the Adult Code Cart and the contents within each drawer.

Security: Cart contents are secured with a breakaway locking handle. A swift hand motion quickly breaks the tamper-evident seal giving access to all drawers and supplies for timely code response.

Stable Maneuverability: The cart is considered a convenient height, smooth, light and easy to move. The low center of gravity makes the cart stable and light. Upgraded wheels and a steering handle speed up movement. The braking system keeps the cart stable and securely parked until needed.

In the redesign process, BMC utilized the Avalo integrated divider system to re-organize their medication and patient supplies drawer by drawer. Current stock was analyzed, with some items removed, and others added. Specific locations were identified at the front of the top drawer for first line advanced cardiac life support (ACLS) medications to allow timely administration. The stock positions were then tested, finalized, and documented for best practice. To facilitate implementation, user guides were developed and included on each code cart with pictures of labeled drawer contents.

Feedback received from clinician's following implementation has been very positive. Users noted the new design is "very organized" and "less crowded". The new locations for medication has resulted in a decrease in the time to administer. Overall, the design is more efficient and focuses on patient safety.

BMC's quality improvement project resulted in a successful redesign and standardization of the hospital's code carts. Through the evaluation and testing process BMC learned there is much more to a superior crash cart/emergency cart than just its physical design. The Avalo Series Emergency Cart's blend of careful design, functionality, and logical organization enhances user efficiency and supports timely code team response.