Airway carts reduce cognitive load, improve preoxygenation techniques

BAYSTATE MEDICAL CENTER

The emergency department at University of Massachusetts Medical School Baystate Medical Center in Springfield is the largest in the western part of Massachusetts, with 94 licensed bays that span 72,000 square feet, and over 120,000 patient visits each year.

Challenge

Emergency airway management is a critical skill for emergency physicians to master, but with many steps for preparation, the potential for numerous complicating factors, and a need to work quickly, it can be difficult for physicians to easily recall all the steps necessary to plan for and complete a successful intubation.

Action

In 2012, Baystate Medical Center opened a new emergency department, which prompted a review of existing equipment in the ED. As part of this transition, and to improve airway management outcomes, Baystate took the opportunity to develop and implement a standardized airway cart to make all airway equipment easily accessible to ED clinical teams. The standardized airway cart is used throughout the emergency department and all staff are trained on best practices in airway management using the cart as a guide for preparation. This allows physicians to cognitively off-load the steps it takes to prepare for intubation and rely on the cart to provide prompts.

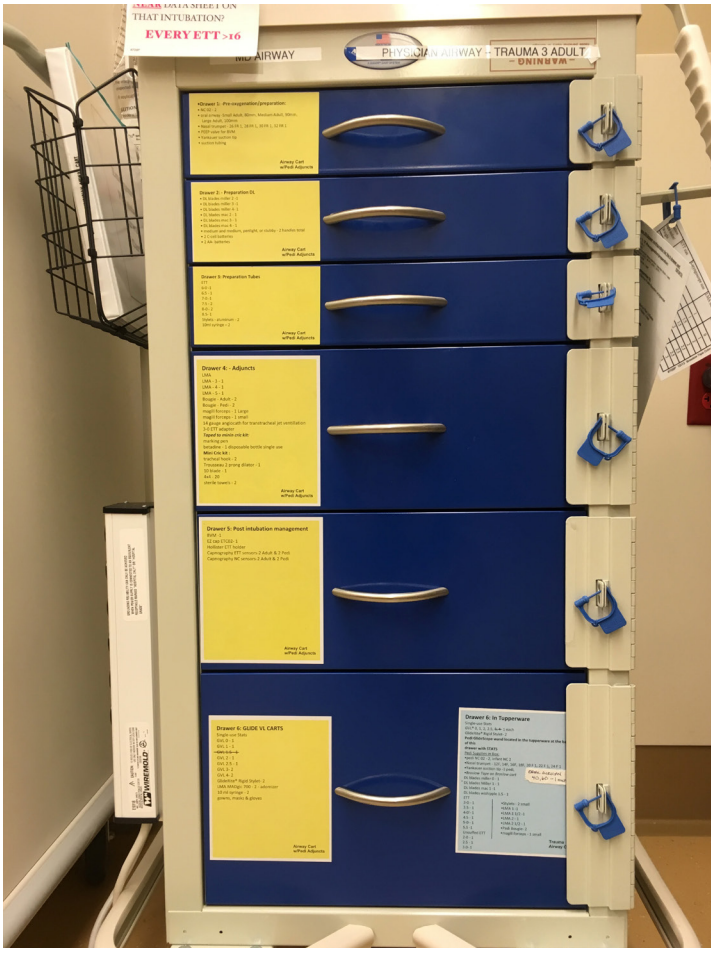
Each airway cart has six drawers, and each drawer contains materials that correspond to a crucial step in the airway procedure planning process. The top drawer focuses on pre-oxygenation, and contains all the materials that a physician might need to open up the airway, keep the airway open and improve positive pressure. The next drawer down offers a selection of tubes for use depending on the patient's physical characteristics, followed by a drawer below that containing an array of laryngoscopes. The next drawer down holds all of the adjunct equipment, including bougies that act as a tube introducer for use when there is an obstructed view of the airway, supraglottic airway devices, and materials for a front of neck or surgical airway if necessary.

This drawer helps a physician think through all of the challenges that might come with a particular intubation and to prepare for those challenges in advance. The next drawer holds materials needed for post-intubation management, including the Hollister devices to secure the ET tube, Bag Valve Masks, and wave form capnography. The bottom drawer holds supplies for videolaryngoscopes and awake intubations, and soon Baystate will have a videoscope paired with every cart.

Roll-out of the carts was paired with education, which included orientation to the cart contents and a reminder of the steps necessary to prepare for an intubation. Training included a special emphasis on preoxygenation, an important first step that, at the time, was often skipped for expedience, but makes a significant difference in terms of outcomes. Now, preoxygenation is standard practice at Baystate and is considered an essential and routine step.

Lessons Learned

There are several key ingredients to success, according to Lucienne Lutfy-Clayton, MD, an associate professor in emergency medicine who led the effort and specializes in airway education. First, there needs to be a planning



process to identify the essential items for the cart, including any specialized equipment that the ED team might need. Second, there must be an upfront investment of resources to find the right carts, purchase them, and stock them with the equipment. Finally, it is important to have a strategy for education and implementation so that staff become familiar with the carts and they become integrated into practice.

◀ **Example of an airway cart at Baystate Medical Center**

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