

UC Davis Medical Center
Emergency Medicine Airway Equipment:
Contents, Cleaning and Stocking

Introduction: Due to the large volume of critically ill patients who present for care at the U.C. Davis Emergency Department (E.D.) we have developed a mechanism for equipment maintenance that provides for rapid processing and restocking. What follows is a description of the equipment maintained in the E.D. for use in routine and difficult airway management in both adults and children.

Airway boxes

Rationale: We have developed a standard equipment list for both adult and pediatric airway supplies. The boxes are painted with an A for adult and P for pediatric for quick identification. These supplies are maintained in a compact and efficient kit which is distributed in a tackle box. This box is portable and reliably supplied to the E.D. from central processing.

Process: The routinely used equipment is cleaned and stocked in the hospital central processing department. A total of twenty-five adult boxes and their respective contents and ten pediatric boxes and their respective contents are maintained in this manner. The senior emergency medicine resident is ultimately responsible for verifying the box contents and including the “*Airway Medication Packet*” (see below) in the readied boxes. After use, the boxes are placed in the “dirty” utility room of the resuscitation room for pick-up and delivery to central processing for cleaning and restocking. Importantly, to avoid contamination of the unused box contents, the used laryngoscope is placed in a plastic zip lock bag before it is replaced into the box.



Figure 1. Airway box.

Equipment Content: Certain redundancy has been designed into the stocking system to provide a fail safe for the possibility of critical equipment failure.

Adult boxes:

Laryngoscope handles (2 each)

Laryngoscope blades: Miller size 2 and 3. MacIntosh size 2, 3 and 4.

Tubes -- cuffed endotracheal tubes in the following sizes:

8.0 pre-styletted (two each)

7.5 pre-styletted (two each)

7.0, 6.5, 6.0 pre-styletted (one each)

Replacement 14 fr. stylette

Colorimetric end-tidal CO2 detector (1)

Twill tape (60 in.) (two each)

Syringe 20 ml (two each)

Syringe 60 ml with taper tip (1)

Magill forceps, large (1)

Cricothyrotomy kit (scalpel #20, Trousseau dilator, tracheal hook)

Tracheostomy Tube (Portex Blue Line, cuffed, 6.0 (I.D.))

Transtracheal catheter, 14 gauge (1).

Medication, standard (1 packet). For contents and processing, see below.



Figure 2. Contents of the adult airway box (medications not shown).



Figure 3. Contents of adult airway box, including medication packet.

Pediatric boxes:

Laryngoscope handles (2 each)

Laryngoscope blades: Miller size 0, 1, 2, and 3. MacIntosh size 1, 2 and 3.

Tubes – cuffed endotracheal tubes in the following sizes (1 each):

7.0, 6.5, 6.0, 5.5, 5.0, 4.5, 4.0, 3.5, 3.0

Tubes – un-cuffed in the following sizes (1 each):

2.5, 2.0

Stylettes (1 each): 6 fr., 8 fr., 14 fr.

Colorimetric end-tidal CO₂ detectors: pediatric (1), adult (1)

Twill tape (60 in) (two each)

Syringes 10 ml (two each)

Magill forceps, large (one) and Magill forceps, small (one)

Transtracheal catheter, 14 gauge (1)

Cricothyrotomy kit (scalpel #20, Trousseau dilator, tracheal hook)

Broselow tape.

Needle, 18 gauge (2), needle-less adapters (2)

Adhesive tape

Medication, standard (1 packet). For contents and processing, see below.



Figure 4. Example of pediatric airway box (medications are not shown).

Medication Process – the *Airway Medication Packet* is filled by pharmacy and stored in the Pyxis system. Upon removal from the Pyxis system, the packages are stored inside the airway box. After stocking medications inside the airway boxes, the previously placed red (i.e. “stop”) tie-lock is replaced with the green (i.e. “go”) tie-lock. The green tie-lock then signifies that the contents of the box have been verified and that the medication bag has been added. Further, the green tie-lock should have the same expiration date, as the medication bag, to signify when the medications will expire. After use, the unused medications are to be placed in the “Return Airway Medication Bin” located in the resuscitation room, under the counter next to bed #1 for pick-up by pharmacy.

Medication contained in packet:

- Etomidate (1) – prefilled syringe (40 mg/ 20 ml)
- Succinylcholine (1) prefilled syringe (200 mg/ 10 ml)
- Rocuronium (1) prefilled syringe (100 mg/ 10ml)
- Atropine – (1) prefilled syringe (0.5 mg/ 5 ml)
- Lidocaine – (1) prefilled syringe (100 mg/ 5 ml)



Figure 5. Medication packet label. Note the expiration date located at the bottom left. This signifies the date of the first medication that will expire in the bag and is the date that should be written on the green “go” tab when it is placed on the box.



Figure 6. Contents of medication packet

Tie-Lock Color Coding: The color system is used to rapidly identify a box that is ready for use. The boxes arrive in the E.D. from central processing with a red tie-lock. When they are stocked with medications by the emergency medicine resident the green tie-lock (which comes with the medication packet) is used to replace the red tie-lock. A box with a green tie-lock has been stocked with medications and its content verified by the resident. Upon opening a box for use, the green tie-lock is discarded. Hence, a box without a tie-lock is assumed to have been used and must be sent back to processing for stocking and cleaning. Please note, that there are significant costs for inadvertently

UC Davis Emergency Medicine Airway Equipment Protocol and Procedures

sending an un-used box back for processing simply because it does not have a tie-lock. If a box is opened but not used, a new green tie-lock must be placed on the box. There is a supply of green tie-locks stored in the drawer in the physician box of Pod C and in the resuscitation room desk top drawer. The color system is summarized as follows:

Red = Stop. The box is clean but has not been stocked with medication nor its contents verified.

Green = Go. The box has been previously stocked with the medication packet and its contents have been verified. It is ready for use.



Green + Expiration Date = Go, as above, but with the medication process completed with verification of the expiration dates.



Please note, only boxes in the resuscitation bays and on top of the crash carts should have medications drawn into syringes.

None = Un-usable. The absence of a tag assumes that the box has been opened and must be assumed to now be incompletely stocked and/or contain contaminated equipment.

Difficult Airway Cart

Rationale: In order to accommodate certain important but infrequently used devices and equipment, we have created a difficult airway cart. The cart is portable and has a large working surface for equipment set up. This cart resides in the adult resuscitation room. The E.D. nursing staff assists in stocking of contents. However, the ultimate responsibility for the contents resides with the senior emergency medicine resident who is required to check the cart at the beginning of each shift.



Figure 7. Difficult airway cart.

The contents of the cart are as follows:

Side: Portable battery operated bronchoscopes (see detailed section below).

After each use the scope must be immediately wiped down and the operating channel irrigated. It must then be immediately given to the E.D. technician for proper cleaning. Do NOT place the scope into a bag, as it may be inadvertently discarded. The initial

irrigation of the channel is of vital importance as secretions can dry in the channel and make subsequent cleaning very difficult. This initial cleaning and irrigation is the responsibility of the physician using the scope. Ultimately, the senior emergency medicine resident is responsible for the care and handling of this fragile piece of equipment.



Figure 8. Bronchoscope case on the difficult airway cart.

1st drawer: Mucosal atomizer device (MAD) with syringes, cricothyrotomy kits, wire cutters, Scalpels (#11, 15, 20), Guedel Blade with handle, Pharyngeal Airway (Size 9, 10)



Figure 9. The first drawer of the difficult airway cart.

2nd drawer: Laerdal Trachlight (assembled and ready for use). King LT Tubes (Sizes #4 & #5), GlideRite ETT (7.0 & 7.5)



Figure 10. The second drawer of the difficult airway cart.

3rd drawer: Nasal intubation equipment: Endotrol ETT (7.0), Chenoweth stylette, headless stethoscope. Trach equipment: *Shiley* cuffed tracheostomy tube (size 6)



Figure 11. The third drawer of the difficult airway cart.

4th drawer: Intubating LMA (size 3, 4, 5), ETT (6.0, 6.5, 7.0, 7.5, 8.0) w/ stabilizer rods.



Figure 12. The fourth drawer of the difficult airway cart.

5th drawer: Percutaneous cricothyrotomy kit (Cook *Melker*, cuffed). Jet insufflator (high pressure tubing and regulator). Airway Exchange catheter kit (Cook), Retrograde Intubation Kit (Cook)



Figure 13. The fifth drawer of the difficult airway cart.

6th drawer: Surgical Tracheostomy trays (1 each – pediatric and adult).



Figure 14. The sixth drawer of the difficult airway cart.

Additional equipment

Pediatric LMAs are located in the “Broselow cart” in the pediatric area. The sizes included in the cart: 1, 1.5, 2, 2.5, 3. Note these are not “intubating” LMAs.

Pediatric King LT Tubes are located in the “Broselow Cart”. The sizes included in the cart are: 2.0, 2.5, 3.0.



Figure 15. The pediatric Broselow cart.

Oral/Nasal airways are located in all of the patient bedside stands as well as the peds resuscitation room.

Jet insufflator is located in both the pediatric Broselow cart and the difficult airway cart.

Glidescope Cobalt: is located in the main resuscitation room. This system relies on disposable small adult and large adult blades. These blades are stored on the Glidescope rack. Back-up blades are stored in the ED storage room. Importantly, none of the Cobalt equipment needs to leave the ED for processing. If cables or screen become soiled they can be cleaned with disinfectant wipes.

Pediatric Glidescope: is located in the pediatrics resus room. It currently has two blade formats. The smallest are the disposable Cobalt and are appropriate for infants and toddlers (similar to a small Miller blade) and the larger non-disposable is more appropriate for larger children to young adults (similar to a mid size Macintosh in the 2-3 range). Please note that the handle of the non-disposable Glidescope must be thoroughly cleaned after each use. The intubator must cap the cable-port and insert the handle into a

clear zip lock bag. **Please, be careful that this handles is NOT thrown away; they are plastic and look disposable.** The bagged handle must then be given to the E.D. technician for cleaning. Note: it cannot be autoclaved. Finally, this equipment should be plugged in to an outlet during storage to maintain battery charge.

SunMed introducers (disposable bougies)

Adult size: can accommodate a tube as small as approximately 5.5 ET. They are located on the PHS supply carts in the RR, Area A, Area B, Area C, and Area D. They should be placed at the head of each RR bed and with the airway boxes on top of crash carts in Area A, B, C, and D.

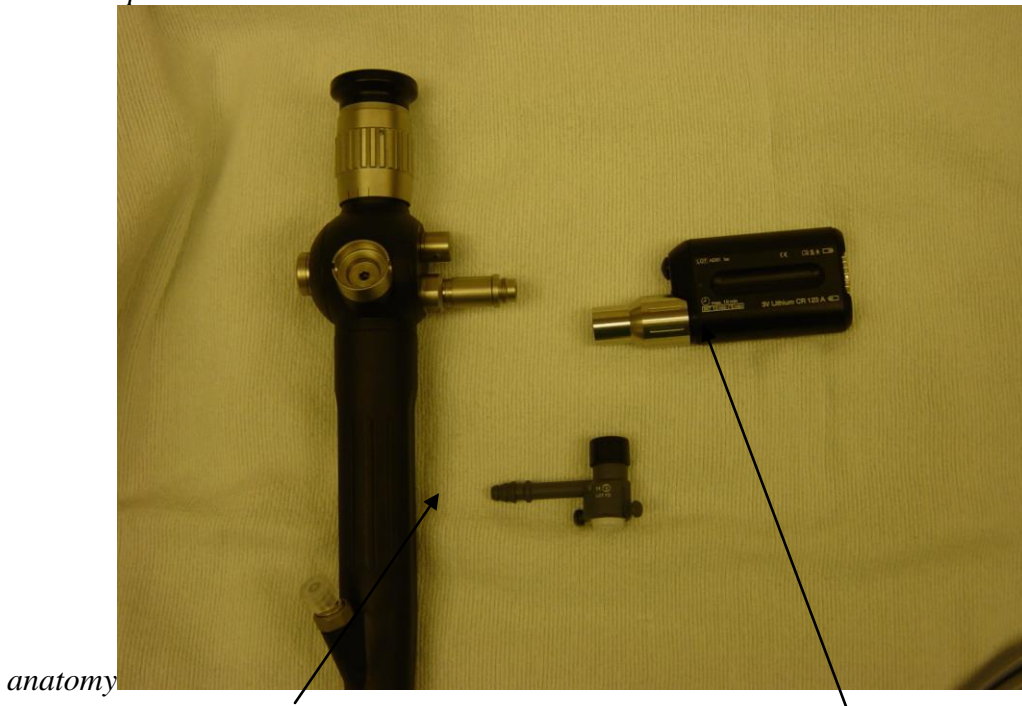
Pediatric size (10 Fr): can be used in as small as a (well lubricated) 4.0 ET. These are located at the head of the beds in the pediatric resuscitation room and are located on the PHS supply cart in Area B.

C-MACs are located in the adult and pediatric resuscitation rooms. Macintosh blade sizes 2, 3 and 4 are available. When done with the equipment the handle is to be removed, the connector capped, and placed into a clear plastic bag and given to the E.D. technician for cleaning. After cleaning the cap must be removed and any residual moisture blown out with wall air. If allowed to sit with fluid the connector will corrode and ruin the blade.

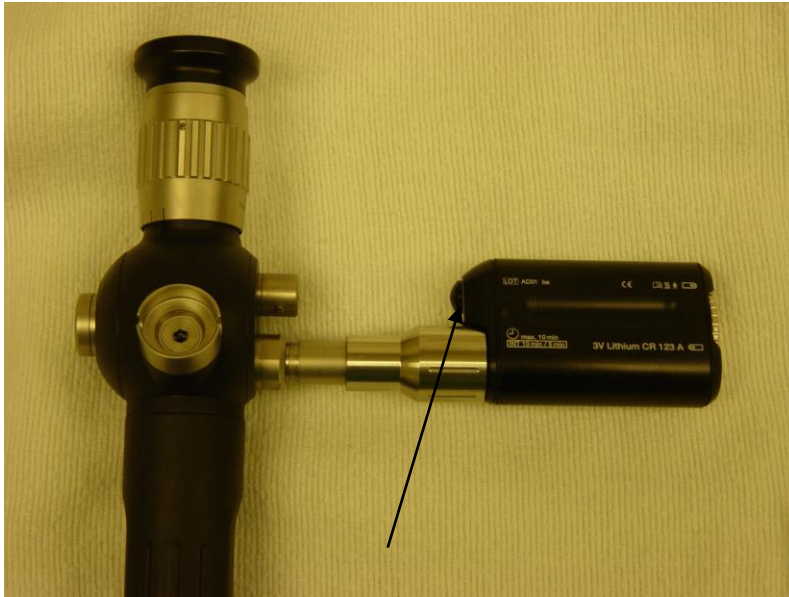
The Bronchoscope

Overview of the equipment and storage

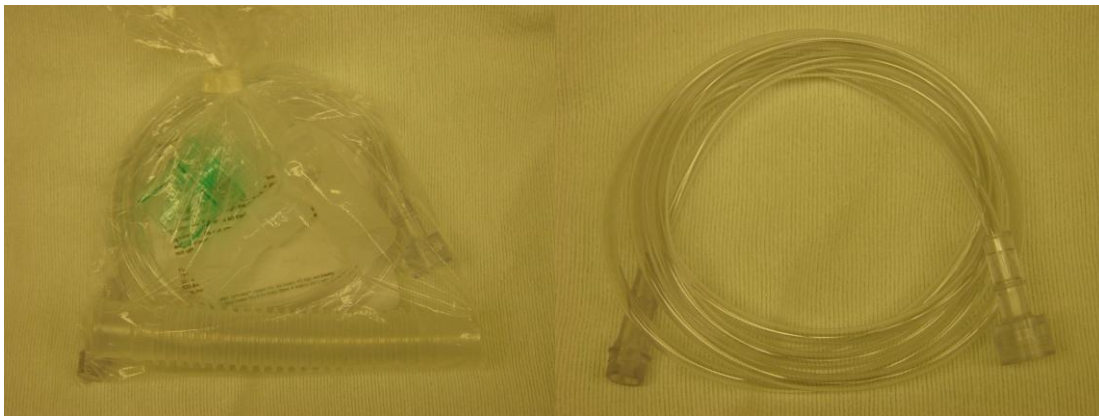
Basic scope



Disposable suction/insufflation trigger



Portable light source attached (arrow = off/on switch)



Obtain female-female tubing from nebulizer kit



Attach oxygen tubing (or suction) to trigger.

Connection to tower screen

Adaptor ring and light cable are stored in tower drawer





The light cable replaces the portable light source. This provides a brighter image and will not deplete the batteries



The box on the side of the difficult airway cart is used to store the scopes.

Note that the portable light source must be removed from the scope prior to storage.

Cleaning

After use:

- a) Irrigate channel with saline
- b) Give the scope directly to the technician who will be responsible for its cleaning
- c) DO NOT put into a hazardous materials bag
- d) Later, follow up and confirm that the scope has been cleaned and replaced
- e) Direct any questions re: cleaning responsibilities to the charge nurse on duty

Revised 5/11.

Questions/comments: A. Bair, M.D (pager 9256).