

PATIENT 1

Procedures Performed: *Tracheostomy, Bronchoscopy*

Tent Facilitation* (**based on feedback from medical team*)

- Good visibility
- Able to extend/retract as needed
- Provided easy emergency access to airway if needed
- Able to easily suspend the vent tubing from Velcro straps on tent hoops
- Patient's arms were placed above the U-shaped base which helped hold the base in place but also provided easy access to IVs, art line for medication administration as well as hemodynamic monitoring

Patient post-tracheostomy

Feedback from Medical Team

Physician Proceduralist

Experienced greater increase in comfort performing procedure under tent. Felt there would be greater aerosolization into the proceduralist's face otherwise (even with appropriate PPE).

Respiratory Therapist

Able to easily suspend the vent tubing from Velcro straps on tent hoops.

Nursing

Thought the device was innovative and noted that it did not interfere with their ability to deliver care.

Bronchoscopy post-tracheostomy to confirm patency

PATIENT 2

Procedures Performed: *Tracheostomy, Bronchoscopy*

Tent Facilitation* (**based on feedback from medical team*)

- Easily retractable for sterile field placement
- Adequate visibility for ultrasound and surgical aspects of the procedure
- Adequate space for instrument handling
- Easy access to CVP monitoring
- Horizontal slits significantly improve range of motion without compromising proceduralists' safety

Patient during tracheostomy

Feedback from Medical Team

The patient was in a negative pressure room, but the proceduralists expressed being significantly more comfortable performing the trach under the tent than without it given the patient's positive COVID status.

Physician Proceduralist

Trach proceduralist felt that the tent would be a valuable asset for other important procedures and phases of patient care, including use of trach mask during future ventilation weaning process for this patient.

Respiratory Therapist

Liked the design and was able to assist on both procedures with no problems. The RT was thankful that our team was working on the device and felt it could be used for other procedures performed at their ICU such as trach mask and extubation.

Bronchoscopy post-tracheostomy to confirm patency

PATIENT 3

Procedures Performed: *Intubation*

Tent Facilitation* (**based on feedback from medical team*)

- Easily retractable for securing of ET tube and placing patient on vent
- Adequate visibility for Glidescope video screen
- Adequate space for instrument handling
- Accessible for providers using the tent for the first time

Feedback from Medical Team

Intubation using Glidescope GO

“The Aerosolve system appears well designed to allow access for airway management, while still providing protection to clinical providers.”

–Sam Schechtman, M.D

Department of Anesthesiology,
University of Michigan

Director, Head and Neck
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Management

Physician Proceduralist

Intubation went very smoothly with first pass success. Thought tent was great and could easily see Glidescope video screen through tent plastic. They liked the additional barrier between them and patient’s airway.

Respiratory Therapists

Thought the tent was great and the design was intelligent. They felt the tent worked well overall and that it didn’t interfere with their ability to provide care for initial resuscitation and induction for intubation in a hemodynamically unstable patient.

Nursing

Able to access port and IVs and start pressors prior to induction. Indicated they felt much more comfortable caring for a critically ill patient with unknown COVID status during aerosol generating procedure.

PATIENT 4

Procedures Performed: *Nebulizer Treatments, Lung/Cardiac Ultrasound Exam*

Tent Facilitation* (**based on feedback from medical team*)

- Tent environment comfortable for patient who was previously claustrophobic with NIV and other situations
- Easy to move during patient transfer between ED and ICU
- Flexible to allow patient to rest semi-recumbent and use pillow
- Accessible for providers using the tent for the first time

Feedback from Medical Team

Ultrasound being performed under tent

Patient

Tent placed without issue and patient felt very comfortable inside. Able to converse with care team and could hear inside tent as well. Able to rest semi-recumbent and use pillow without blocking HEPA filter. The patient remained in tent for > 3 hours and stated they could have tolerated it for much longer.

Physicians

First experience with tent. Able to do a full lung and cardiac ultrasound exam with tent in place without issue.

Respiratory Therapy

Thought tent was very easy to use. Could pass NIV tubing under tent (from foot to head) and adjust NIV mask without issue.

Nursing

Able to apply tent to patient independently and transfer patient from resus bay to EC3 room with tent in place without issue. Moved from ED stretcher to ICU bed with tent in place with no complications.

Patient receiving nebulizers inside tent

PATIENT 5

Procedures Performed: Endoscopic Retrograde Cholangiopancreatography (ERCP)

Tent Facilitation* (*based on feedback from medical team)

- Custom arm holes allowed for endotracheal tube access and manipulation throughout procedure
- Providers could quickly and easily pass vent tubing through custom hole made in tent above patient's head

Feedback from Medical Team

Patient was intubated and prone by anesthesia. Tent was placed over patient and white arm boards tucked underneath patient's arms. A fluoroscopy unit is used during these cases, and the tent had to be partially collapsed to allow the fluoro unit/c-arm to clear the tent hoops. This did not affect usage of the tent or the procedure.

Tent hoops slightly collapsed to accommodate over table fluoroscopy.

Gastroenterologist

First experience with tent and thought it was great. Cut custom arm holes in locations that worked for her for the procedure. Was able to pass the endoscope through side hole cut in the tent and intubate the esophagus without issue.

CRNA

Made custom holes for her hands which allowed endotracheal tube access and manipulation throughout the case.

CRNA monitoring patient's airway

PATIENT 6

Procedures Performed: Non-Invasive Ventilation, Intubation

Tent Facilitation* (*based on feedback from medical team)

- Tent environment comfortable for patient
- Custom arm holes allowed staff to place patient on NIV and then intubate
- Accessible for providers using the tent for the first time
- Tent canopy allowed for clear visualization of Glidescope video screen
- Tent structure allowed staff to exchange procedure tools between each other, to position the patient's head, and to auscultate patient without difficulty

Feedback from Medical Team

Respiratory Therapist

First experience with tent. Cut custom arm holes in locations that worked for her to place patient on NIV and to assist with intubation.

EM Junior Resident

First time using the tent. Intubated patient without difficulty. Resident used GlidescopeGo and had no issues with visualization of video screen through the plastic canopy and passed the tube with ease on first attempt.

EM Senior Resident

First time using the tent. Assisted with intubation and cut own individual arm access holes through side of tent. Had no issue assisting with head positioning or handing tube to junior resident. Auscultated without difficulty.

Nursing

First experience with tent. Found it easy to set up and take down. No issue accessing patients IVs for med administration and able to pass orogastric tube without difficulty within tent.

Patient on NIV in tent

Intubation with junior and senior resident and RT with arms in tent

PATIENT 7

Procedures Performed: Percutaneous dilatational tracheostomy (PDT)

Tent Facilitation* (*based on feedback from medical team)

- Flexible to allow nursing staff to access patient's IV for medicine administration
- Accessible for providers using the tent for the first time

Feedback from Medical Team

Tent placed over patient and connected to exhaust fan without issue. Access holes initially cut on patient's right to accommodate ventilator tubing. Subsequently cut holes at head of canopy and on left side for the proceduralist performing tracheostomy (from left) and bronchoscopy (from head of bed). The endotracheal tube was withdrawn under real-time ultrasound and bronchoscopic guidance within the tent. The proceduralist then completed the procedure through the slits on the left side.

Withdrawal of endotracheal tube using real-time ultrasound within the Aerosolve tent

Respiratory Therapist

First experience with tent. Was able to handle all disconnections and connections of ventilator tubing to the endotracheal tube and then to the tracheostomy tube, through the slits on the right side.

Proceduralist

Had performed two prior tracheostomies within the tent. Was able to fit all necessary equipment within the tent and complete the procedure without complications.

Nursing

First experience with tent. Had no issues accessing patients IVs for medicine administration.

Confirmation of guidewire location using real-time ultrasound within the tent.

PATIENT 8

Procedures Performed: Heated High-Flow Nasal Cannula

Tent Facilitation* (*based on feedback from medical team)

- Tent environment was comfortable for patient and allowed patient to communicate with hospital staff and family members
- Easily assembled and deployed by a first year EM resident under supervision

Feedback from Medical Team

Shortly after the patient was brought to the resuscitation bay with COVID-19 status unknown, ED nursing suggested / requested use of the tent due to the possibility of COVID-19, the patient's critical illness, and the likely need for aerosol generating procedures.

Respiratory Therapy & Nursing

Tent was well received. They stated the tent did not interfere with heated high-flow nasal cannula or other interventions.

The patient stated they were comfortable and had no issues with the tent. They were able to communicate easily with family and hospital staff.

"As we move past the surge and into the tail of COVID 19 at Michigan Medicine, it is vital that we discover innovative ways to provide high quality care and the safest way possible. I strongly believe that the Aerosolve Compact Respiratory Isolation System will be a tremendous asset to both the patients as well as the health system."

–Phil Choi, M.D

Assistant Professor of Internal Medicine
Division of Pulmonary and Critical Care, University of Michigan
Medical Director, Assisted Ventilation Clinic