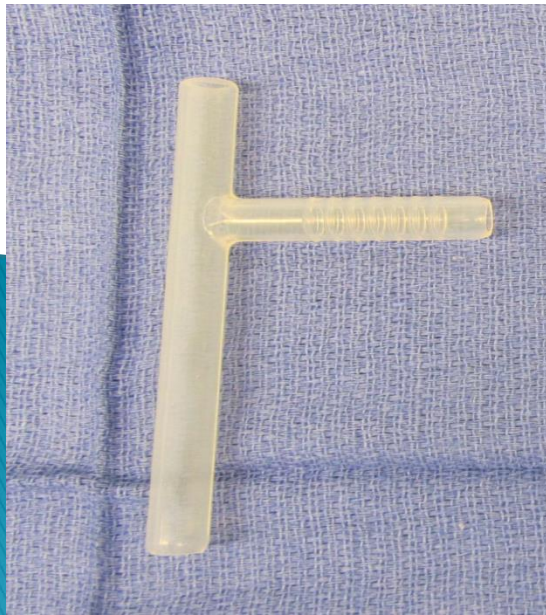
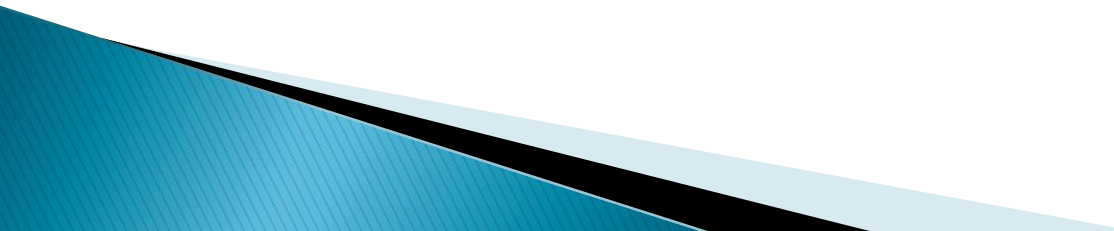


# A Healthsystem Change in Practice in the Care of Patients with Tracheal T Tube During a Code

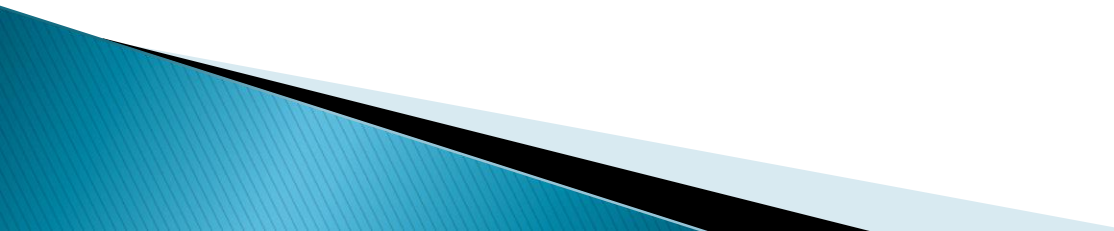
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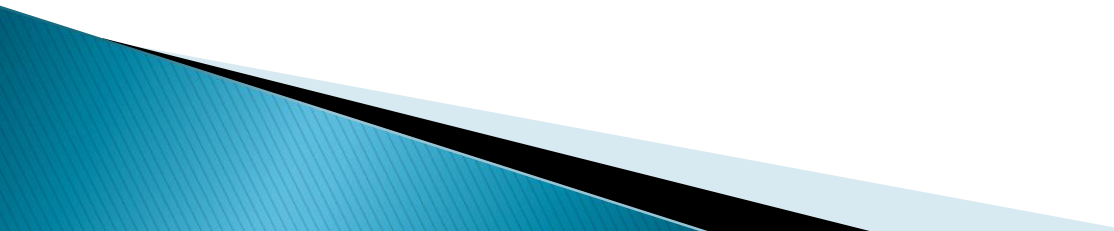
# Objectives and Disclosure Statement: Malou Blanco Yarosh, MSN,RN,CNS

- ▶ At the end of the presentation, attendees will be able to:
    - 1) State differences between tracheal T Tube and conventional tracheostomy tube.
    - 2) Describe specific airway patency resuscitative efforts on patients with tracheal T tube.
  - ▶ No conflict of interest, no sponsors, no commercial support provided for this presentation.
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# PROBLEM STATEMENT

- ▶ The absence of a universal adapter **in the head and neck nursing unit** for a tracheal T Tube, needed to fit and seal onto the Ambu-bag during a code, resulted in a catastrophic event.
  - ▶ Patient suffered brain anoxia with resultant persistent and continuous vegetative state.
- 

# Purpose

- ▶ Implement practice change across the health system on the management of patients with tracheal T tube during a code.
  - ▶ Zero mortality and morbidity after implementation of practice change.
- 

# Catalyst for Change

- ▶ Three codes involving head and neck patients with surgical airways resulted in adverse outcomes.
  - ▶ Events root-cause analyzed.
  - ▶ Root cause analysis showed multifactor failures in system.
  - ▶ Department of Nursing led trans-professional and trans-departmental efforts for corrective action.
  - ▶ Review of evidenced-based national standards: Anesthesia, Head and Neck, Society of Otolaryngology and Head and Neck Nursing Standards.
  - ▶ Algorithm for difficult airways formulated based on interprofessional standards.
  - ▶ Interprofessional and interdisciplinary algorithm jointly approved by the Departments of Anesthesia, Nursing and Head and Neck.
- 

# Difficult Airway Code Blue Algorithm: Patient with Trach or T-tube

Recently Decannulated Trach [Dressing over Trach Site]

1. Attempt to reinsert trach or endotracheal tube into stoma
2. Attempt oral or nasal intubation
3. Insert LMA
4. Cricothyrotomy

VENTILATE Via Trach Confirm with CO2 Monitoring

Non-functioning Trach or Tracheal T-Tube Present

## Trach Patient:

1. Remove inner cannula & suction distal airway, insert new inner cannula
2. Remove and reinsert new trach or endotracheal tube

## T-Tube Patient:

1. Suction T-tube and apply adaptor from end of endotracheal tube to T-tube for ventilation
  2. Remove T-tube using a hemostat and insert a trach or endotracheal tube
- Attempt oral or nasal intubation, LMA, or cricothyrotomy if above ineffective

VENTILATE Via Trach Confirm with CO2 Monitoring

Patient with History of Difficult Intubation / Sign Posted at HOB

1. Direct laryngoscopy with oral or nasal intubation
2. Glidescope or fiberoptic intubation
3. Insert LMA
4. Cricothyrotomy

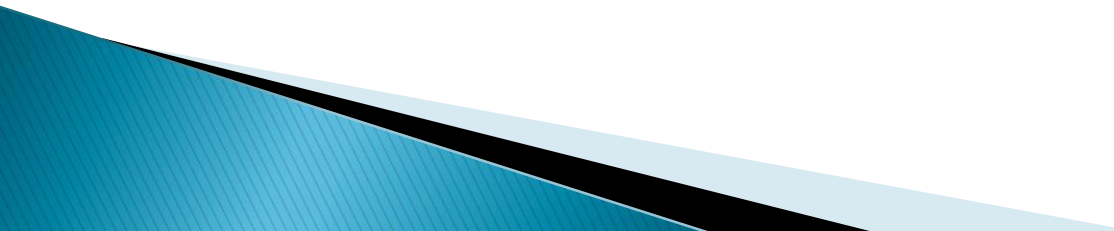
VENTILATE Via Airway Confirm with CO2 Monitoring

# Current State: Nursing Department

- ▶ Two designated head and neck surgical units in UCLA Health System Ronald Reagan campus.
- ▶ Bases of Clinical Nursing Practice
  - Evidence and research-based specific **guidelines**
  - National **specialty standards** for the care of a patient with a tracheal T Tube
- ▶ Specialty-specific head and neck **competencies** used for on boarding of new staff
  - Suctioning and airway management in the event of a code on a patient with a tracheal T Tube.
- ▶ Completion of **mandatory specialty head and neck seminar** prior to independent practice in unit.
- ▶ Successful demonstration by Clinician to Preceptor: Ability to safely care for patients with tracheal T tube.



# Current State

- ▶ Algorithm was a Nursing-led effort .
  - ▶ Departments of anesthesia and head and neck chairs, residency education chairs were involved.
  - ▶ Algorithm is placed in all emergency crash carts.
  - ▶ The goal was to prevent incidents like the one described.
  - ▶ T tube adapter housed in Respiratory Therapy department.
- 




# Current State

- ▶ Anesthesia and head and neck residents jointly educated on algorithm.
- ▶ Nursing staff educated on new algorithm and algorithm placed in all crash carts.
- ▶ Two weeks post-education, a head and neck patient was successfully resuscitated following new algorithm.
- ▶ Algorithm and competencies specifically state that an adapter be applied to the T tube for ventilation.
- ▶ A year post -algorithm implementation, algorithm not followed when head and neck patient with a tracheal T tube had respiratory arrest, patient sustained anoxic brain injury.
- ▶ In this particular case, Nursing requested an adapter from R.T. to apply onto tracheal T tube. No adapter present at bedside.

# Current State

- ▶ Code blue team unaware that the end of the endotracheal tube could be used as an adapter to connect to the tracheal T tube per algorithm.
- ▶ Adapter needed to maintain a seal between the T tube and the ambu bag to bag the patient.
- ▶ Anesthesiologist plugged the tracheal T tube and attempted to intubate the patient orally.
- ▶
- ▶ The algorithm was not followed in this case, which calls for the removal of the tracheal T tube and the insertion of a regular tracheostomy tube.
- ▶ In the absence of the adapter, nursing staff (night shift staff as the code happened off hours) aggressively called for the removal of the T tube and the placement of a regular tracheostomy tube to no avail.
- ▶ The patient sustained a catastrophic brain anoxia with resultant vegetative state.

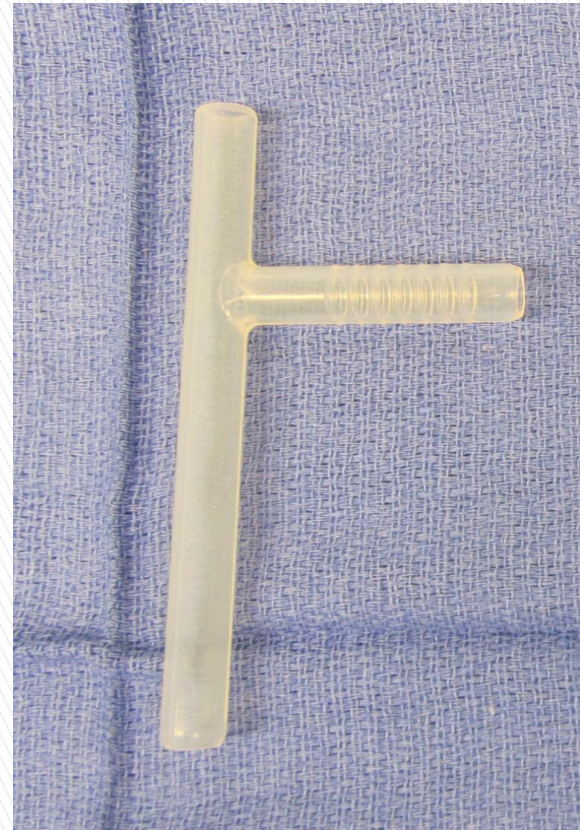
# Analysis of Current State

- ▶ Despite initial education, definite knowledge deficits exists among respiratory therapists, code blue MDs on the management of patients with tracheal T Tubes.
  - ▶ The health system failed in that the adapter was not available when needed.
  - ▶ The adapter should have been made available at the unit level, despite its cost or classification as a “slow moving item”.
  - ▶ These adapters should have been listed in our PAR and placed at our supply room.
  - ▶ The ET tube connector could have been used as a substitute per algorithm but nurses and MDs did not utilize it.
  - ▶ Changes in frontline leadership, directors and chairs contributed to non-sustained practice change.
- 

# Tracheal T Tube

## What is a Tracheal T-tube?

- Tracheal T-tube is a tracheal airway stent made of silicone and shaped like the letter “T”
- It maintains an adequate tracheal airway, while providing support of a stenotic trachea that has been reconstituted or reconstructed
- Comes in various sizes
  - Most commonly used sizes at UCLA are #10 for women and #11 for men

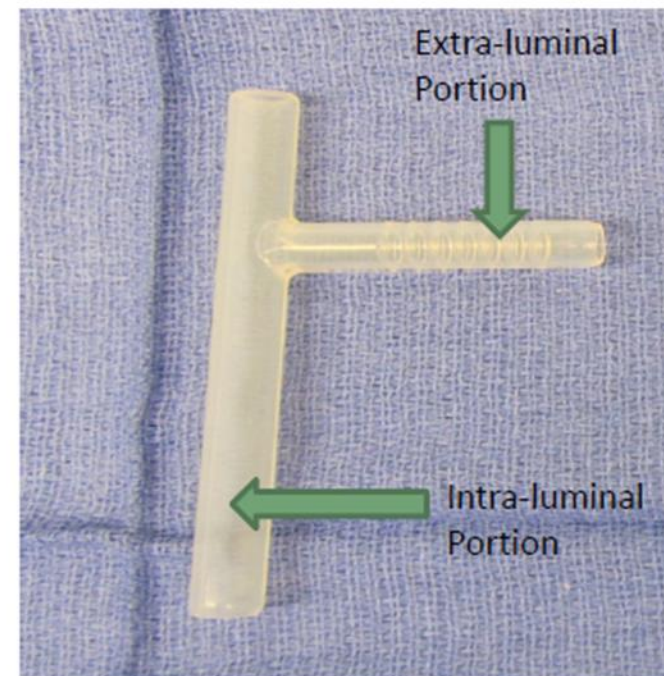
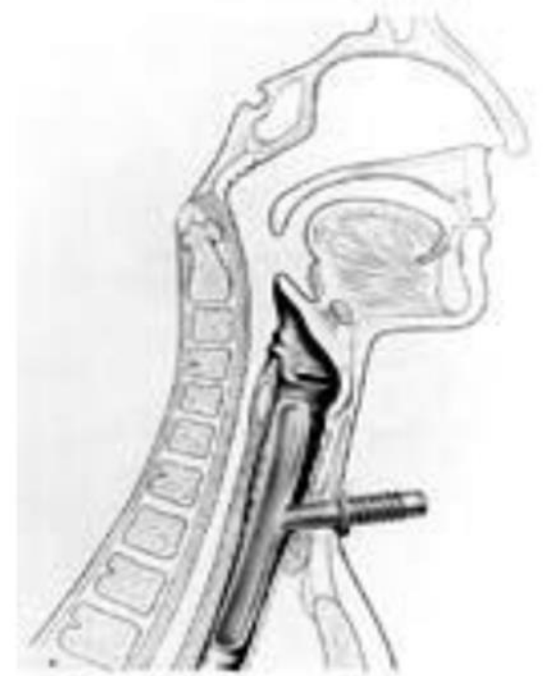


Tracheal T Tube

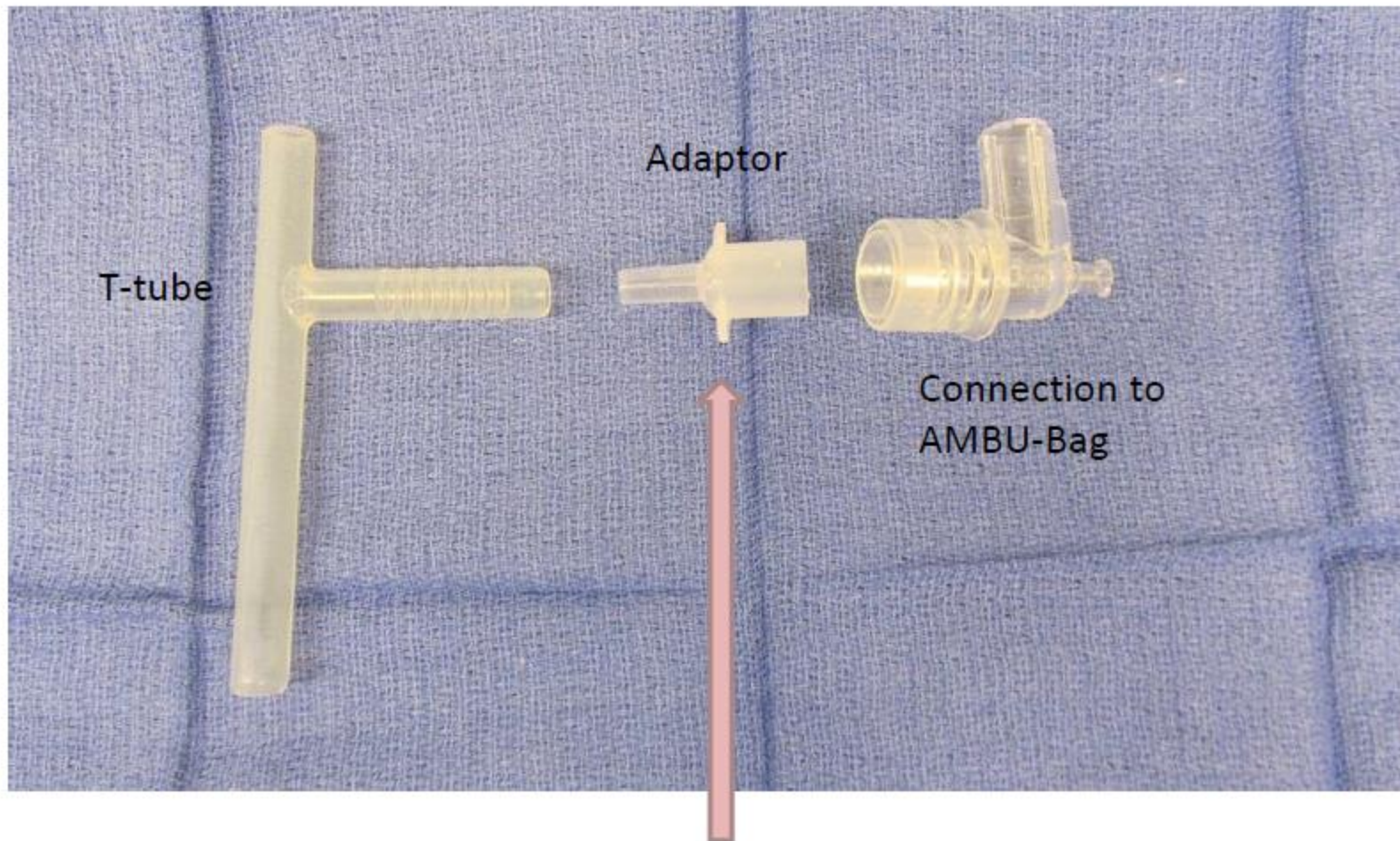


# Other Features of T-tubes

- Serves as both a stent, to prevent airway collapse, and a tracheostomy tube, for breathing
- Because it is made of silicone, it initiates little to no tissue reaction
- Extra-luminal end can be plugged so speaking and breathing through the nose and mouth is possible while the T-tube stent is in place
- Mucus and crusts in general do not adhere to the silicone. HOWEVER,
  - T-tube does NOT have an inner cannula and mucus plug prevention is important
  - Regular suctioning and keeping the tube capped is key to mucus plug prevention
  - In case of significant mucus plug the T-tube may need to be removed.



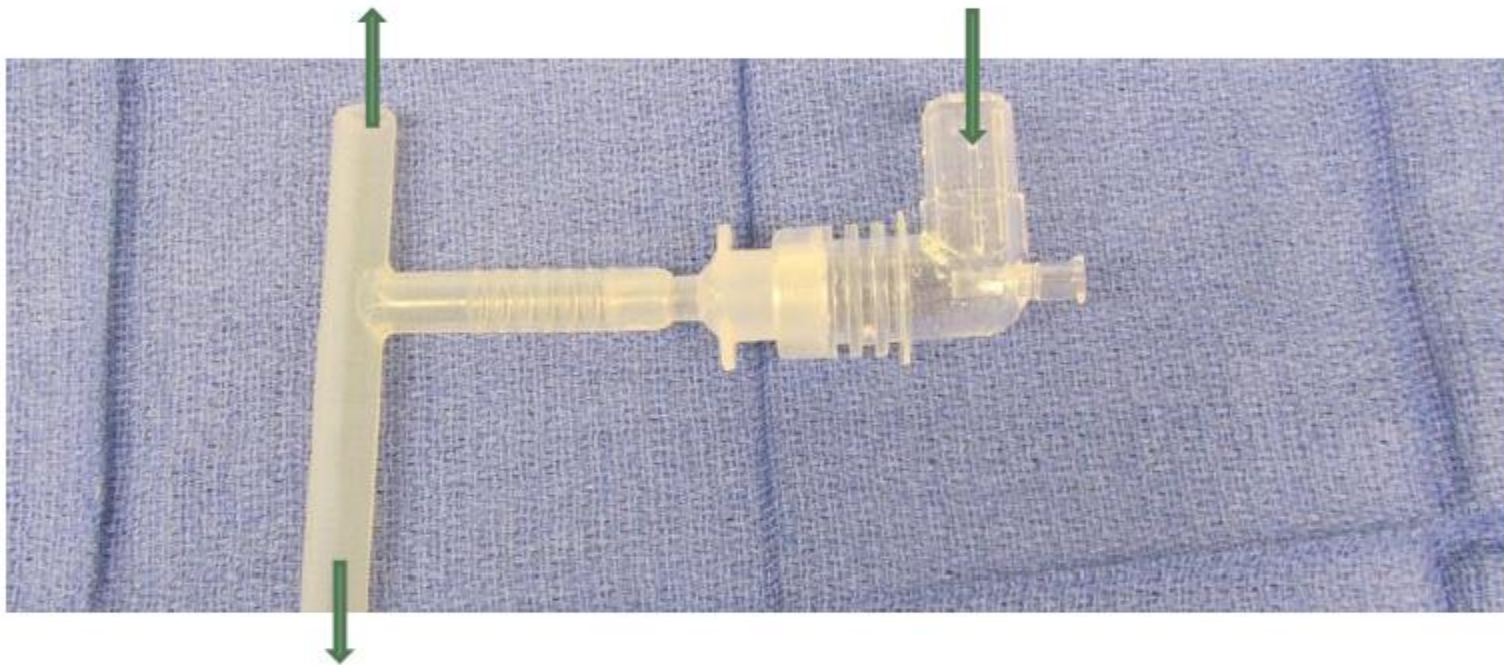
# Ventilating Through T-tubes







# Ventilating Through T-tubes



Note that when Ambu-bagging a patient via a T-tube, airflow is directed both

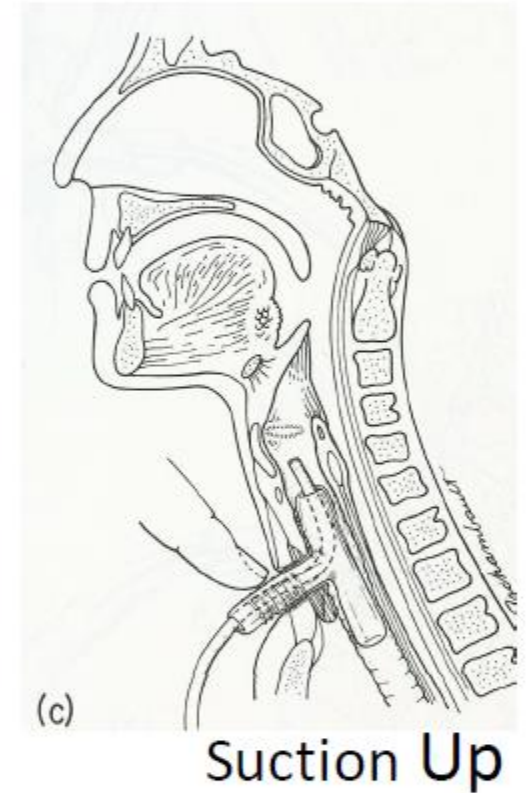
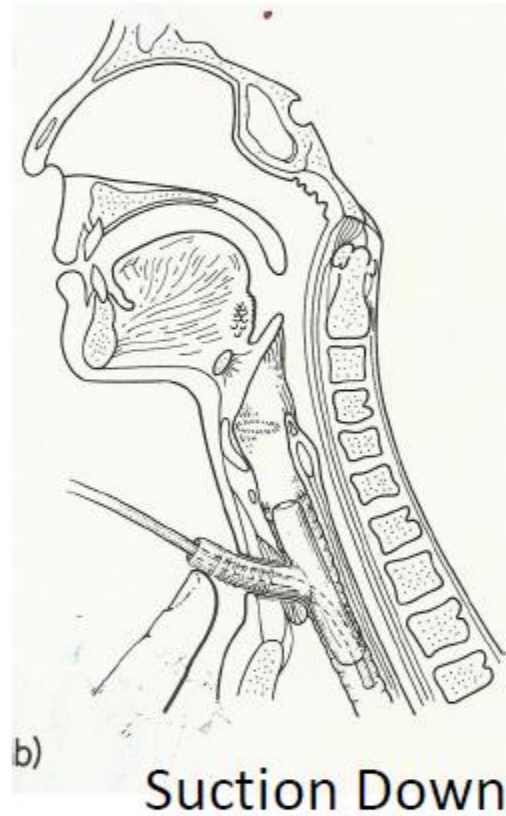
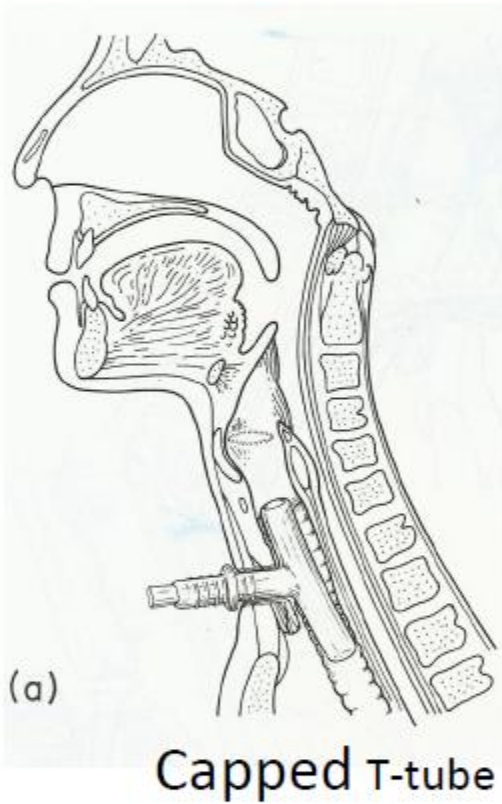




# Ventilating through T-tubes



# Suctioning T-tubes



The external portion of the T-tubes should be directed up to suction down towards the lungs.  
The external portion of the T-tube should be directed down to suction up towards the vocal cords.

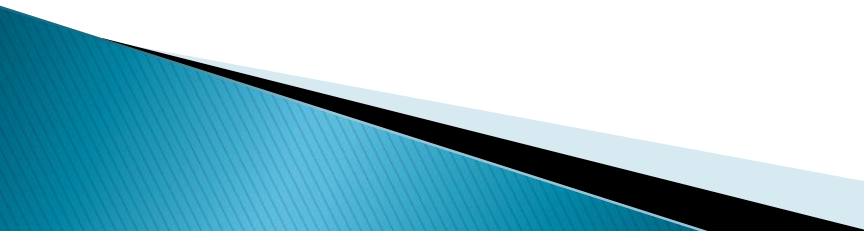
# IMPLEMENTATION OF CORRECTIVE ACTION

- ▶ Massive **re-education** of RNS, LVNs by Head and Neck Clinical Nurse Specialist, RTs, MDs and residency education chairs.
- ▶ Inclusion of tracheal T tube adapters in competencies interprofessionally
- ▶ ( RNs, MDs, RTs )
- ▶ Review of difficult intubation algorithm in all nursing competency classes and MD residency education
- ▶ Presence of T Tube adapters in unit emergency crash cart
- ▶ Non dependence on RT staff
- ▶ Empowering head and neck RNs to oblige code blue staff to follow set algorithm
- ▶ Specific orders and pictures of tracheal T tube on airway management highlighted in the Electronic Medical Record .

# SUSTAINABILITY OF HEALTH SYSTEM PRACTICE CHANGE

- ▶ Quality Department monitors event reports under “Tracheostomy” category.
- ▶ Reports submitted to Head and Neck Clinical Nurse Specialist for review and corrective action as needed.
- ▶ SUSTAINABILITY PLAN:
  - Head and Neck Clinical Nurse Specialist meets every quarter with the Anesthesia Residency Education Chair
    - Purpose of meeting:
      - Review the difficult intubation algorithm
      - Ensure that code blue anesthesiologists are competent in a code involving a head and neck patient with a tracheal T Tube.
- ▶ **Designated Head and Neck Clinical Nurse Specialist as subject matter expert to lead and monitor compliance with practice change.**

# Results

- ▶ To date, no repeat event, no adverse event has occurred or reported.
  - ▶ No death, no mortality reported.
  - ▶ Monthly reports submitted by the Head and Neck Clinical Nurse Specialist to Legal Department and University of California Office of the President (UCOP) on the results of the implemented action plan.
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# Questions?

