TRACH SAFE: KEEPING TRACHEOSTOMY PATIENTS SAFE AT HOME AND SCHOOL

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Objectives

• Summarize the evolution of Trach Safe and its promotion of airway safety for all trach patients

• Identify nursing practices that promote airway safety at home and at school

• Recognize and prevent airway emergencies in a trach patient

• Describe how to respond to an airway emergency in a trach patient
2013: Alarming increase in trach related deaths at home (n=4)
Identify Airway Risk Before Hospital Discharge

#1 Trach Safe Airway Endoscopy Prior to Discharge - >500 endoscopies performed since 2014

- Establish Emergency Airway Management Plan:
  - Bag through upper airway?
  - Intubate through upper airway?

- Airway Diagnoses and Explanation

- Information Guides:
  - Parent education
  - Home nursing education
  - Emergency Medical Services response

- Airway abnormalities identified; interventions improve airway safety prior to discharge
Education for Community Nurses

#2 Trach Safe Nursing Emergency Airway Management Course

- Five hour class taught by MD/RN/RT specialists
- 2 hours of high fidelity simulation—airway emergencies
- CPR via trach
- Suctioning
- Home safety
- Airway ventilation
- Trach changes
- 224 nurses have attended

#2 Trach Safe Nursing Emergency Airway Management Course
#3 Near Miss Data Collection on Home Airway Events

- Data collection each ventilator clinic, now in the EMR
- >200 patients, >720 clinic visits
- New database to guide safety improvements for home and drive changes in caregiver education
Trach Safe Results

• 87% had an abnormal finding on the 1st endoscopy

• 33% had an unplanned procedure to improve airway patency or safety
  • Granulation excision = 44%
  • Steroid injection = 22%
  • Dilation = 19%

• 84% of nurses had < 10 hours of trach training (pre-course survey)

• 69% of home nurses had never managed a trach-related emergency
  • 93% home or school-based nurses

• 84% of nurses reported a high confidence in trach skills after the emergency airway course
  • Responding to a dislodged trach tube
  • Responding to an obstructed trach tube

• 75% less unanticipated deaths at home
  • 2009-2014—8 unanticipated deaths
  • 2014-2018—1 unanticipated death
  • 2014-2020—2 unanticipated deaths
AIRWAY SAFETY

CRITICAL SKILL: UNDERSTANDING A TRACHEOSTOMY TUBE
PATIENT SAFETY AT HOME AND SCHOOL

WHY DOES THE PATIENT HAVE A TRACH TUBE?

WHAT HAPPENS TO THE PATIENT IF THE TRACH IS OUT OR PLUGGED?

WHAT IF THE VENT MALFUNCTIONS?

KNOWING THESE ANSWERS GUIDES LIFESAVING INTERVENTIONS
Patients with upper airway obstruction

**SUBGLOTTIC STENOSIS**

Cotton Meyer Grading System

<table>
<thead>
<tr>
<th>Grade</th>
<th>From</th>
<th>To</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>No stenosis</td>
<td>10% stenosis</td>
<td><img src="image" alt="Image 43x213 to 294x392" /></td>
</tr>
<tr>
<td>II</td>
<td>10% stenosis</td>
<td>70% stenosis</td>
<td><img src="image" alt="Image 184x46 to 436x158" /></td>
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<tr>
<td>III</td>
<td>70% stenosis</td>
<td>90% stenosis</td>
<td><img src="image" alt="Image 541x158 to 730x337" /></td>
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<tr>
<td>IV</td>
<td>No detectable lumen</td>
<td></td>
<td><img src="image" alt="Image 16x482" /></td>
</tr>
</tbody>
</table>

Lesions of the larynx, trachea and upper airway, Pediatric Surgery, 2012

**SMALL JAW/ TONGUE OBSTRUCTION**

**AIRWAY COLLAPSE**

Tracheomalacia

Bronchomalacia

**SECRETION REMOVAL**


Pediatric tracheomalacia, Seminars in Pediatric Surgery, 2016
Tracheostomy for Ventilation

--HYPOTONIA: SMA—Spinal Muscular Atrophy

--ABNORMAL RESPIRATORY DRIVE:

  CCHS

  Quadriplegia

--CHRONIC LUNG DISEASE: BPD

Or……**BOTH**------- BPD with Grade III subglottic stenosis
“There was a little girl who had a little curl. Right in the middle of her forehead; When she was good, she was very, very good, And when she was bad she was horrid.”
Maintaining airway patency, air movement and adequate ventilation are key goals of nursing care for patients who are tracheostomy/ventilator dependent.
PROMOTING AIRWAY SAFETY ➔ A-I-R

Reconizing emergencies

**ASSESSMENT**—Look, don’t touch, observe, gather data

RR/ HR/ fever/ Sats/ O2 use/ type of alarms/ retractions

SOB/ URI symptoms/ use of humidity/ cough history

Acute change? Trends? Timing? ➔ Compare against baseline

**STOP HERE AND INTERVENE IF EMERGENT:**

APNEA / BRADYCARDIA / HYPOXIA

GASPING RESPIRATIONS / ANXIETY/ FLAILING CHILD

CHANGE IN LOC / UNRESPONSIVE/ COLOR CHANGE
PROMOTING AIRWAY SAFETY ➔ A-I-R

WHEN IN DOUBT AND THE PATIENT IS IN DISTRESS, CHANGE THE TRACH TUBE

“When in doubt, change it out!”
PROMOTING AIRWAY SAFETY ➔ A-I-R
Recognizing emergencies

**INSPECTION**—All lung fields, after suctioning (transmitted sounds)

- Breath sounds—note how they change with suction/cough or if they persist
- Air movement, R<->L, air movement to bases, decreased
- Chest wall symmetry/excursion with respiration
- Trach secretion changes

An alarming machine can wait--
PROMOTING AIRWAY SAFETY → A-I-R

Resolution: How much time do you have?

Tube in the stoma / Keep it secure / Get it open / Keep it open

TRACH IN / TRACH OUT? 911?
PASS SUCTION CATHETER?
Humidity, humidity, humidity……
Suction / CPT / cough assist / oxygen
Meds—albuterol, hypertonic saline
Fever control

Find and follow trends
PROMOTING AIRWAY SAFETY

ENVIRONMENTAL ASSESSMENT

✓ BACKBOARD/HARD SURFACE FOR COMPRESSIONS?
✓ RESUSCITATOR BAG READY? PEEP VALVE ON?
✓ OXYGEN NEARBY, FULL AND READY?
✓ SPARE TRACH TUBES/TIES?—same/one size smaller
✓ BATTERIES CHARGING? FULL?
✓ EQUIPMENT PLUGGED/CHARGING
✓ SUPPLIES NEARBY?

...............THE GO BAG

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PROMOTING AIRWAY SAFETY: GO BAG

NO:

NOT IN THE CAR
NOT UPSTAIRS
NOT DOWNSTAIRS
NOT IN THE OTHER ROOM
NOT THE “EVERYTHING” BAG
“I DON’T KNOW THE EMERGENCY PLAN”

YES:

RIGHT NEXT TO THE CHILD
FULLY STOCKED
CHECKED DAILY
CORRECT SIZES OF TRACHS/CATHETERS
“I KNOW THE EMERGENCY AIRWAY PLAN”

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PROMOTING AIRWAY SAFETY
FIGHT COMPLACENCY

PROMOTING AIRWAY SAFETY

PREOCCUPATION WITH FAILURE

Search for early failure points:

✓ Trach secure in stoma, patent, with adequate humidity
✓ Trained caregiver awake and nearby
✓ Emergency airway plan is in place, ready to enact
✓ Routine and emergency supplies and equipment at hand
✓ Routine and emergency medications at hand
✓ Plan of care supports patient care and safety
RESPONDING TO AIRWAY EMERGENCIES

If at any time your child loses consciousness, start CPR.
AIRWAY SAFETY

CRITICAL SKILL: CPR VIA TRACHEOSTOMY TUBE

A ➔ AIRWAY

B ➔ BREATHING

C ➔ CIRCULATION
AIRWAY SAFETY

CRITICAL SKILL: CHANGING A TRACH TUBE

CLEAN HANDS/GLOVES

PHONE

TRACH / ONE SIZE SMALLER / TIES/OBTURATOR

TRAINED SECOND CAREGIVER (Unless emergent)

OXYGEN / SUCTION / RESUS BAG (PEEP Valve)

OXIMETER

LUBE / DRESSINGS
CRITICAL SKILL: CHANGING A TRACH TUBE

Suction tube in place, lift chin (shoulder roll)
Check cuff on new tube for patency (If present)
Lube to new trach trach, ties is place in eyelets
Person holding old trach removes down and out
New tube in, aim towards posterior wall and down
Remove obturator!
Tighten ties—one finger snugly between tie and neck
Suction, verify patency, inflate cuff
Check ties 30-60 minutes later (They can loosen over time)
Check ties every 2-4 hours, more for patients with a critical airway
AIRWAY SAFETY

CRITICAL SKILL: TALE

T  Trach in  ↔  Trach out

A  Airways patent—trach and internal free of infection

L  Lungs—clear/open/free of infection, ventilating

E  Equipment—working, charged, maintained
TRACH TUBES ARE LIFELINES FOR PATIENTS WHO DO NOT HAVE PATENT UPPER AIRWAYS OR RELY ON MECHANICAL VENTILATION