

Hybrid Model for Surgical Airway

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January 23, 2024

Learning Objectives

- Limitations of traditional training methods + benefits of a hybrid model.
- Creation of the hybrid model + diverse group of learners who can benefit.
- Use in on-going training and competency for emergency surgical airway access.

Traditional Training Methods



Task Trainers

- Expensive to purchase
- Can require repair/maintenance
- Expensive replacement parts
- Limited realism - Synthetic Tissue



Pig Tracheas

- Access to tissue
- Limited realism – no surrounding anatomy
- Real Tissue/better haptics



Human Cadavers

- Cost prohibitive
- Facility Resources
- Limited availability
- Real Tissue/better haptics + High realism

Hybrid Model

Combines the feel of real tissue with a physical head and neck



- Plastic Head
- Foam Neck



- Pig Trachea
- Pig Skin

Head Prep



- Remove neck, leave flap at back

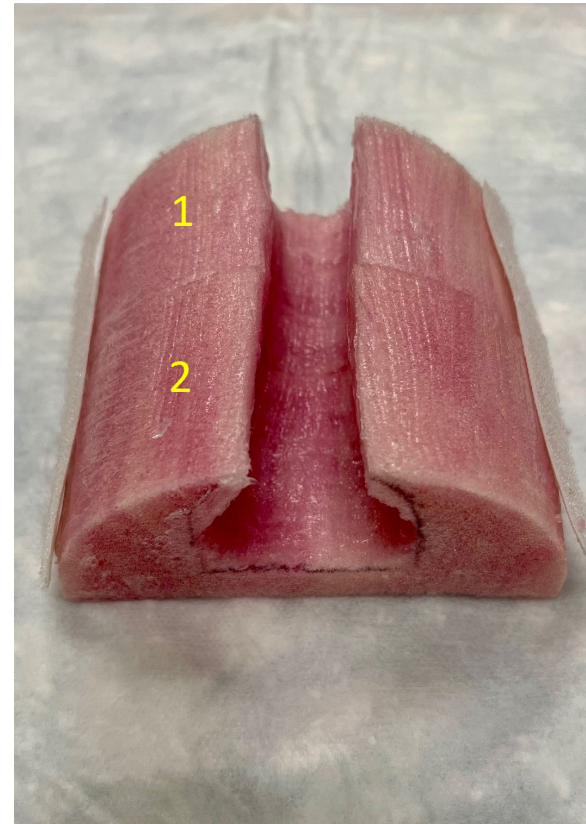


- Hollow out inside to create room for larynx

Neck Prep

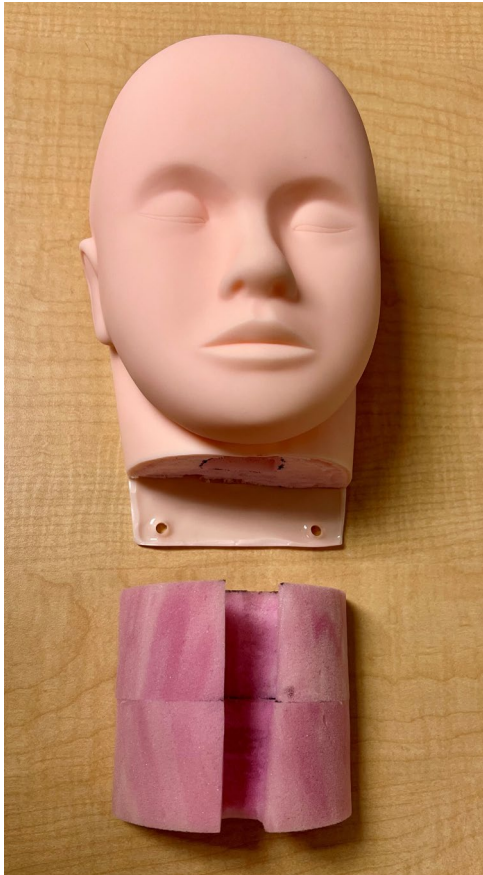


- Inside piece of foam donut
- Cut in half

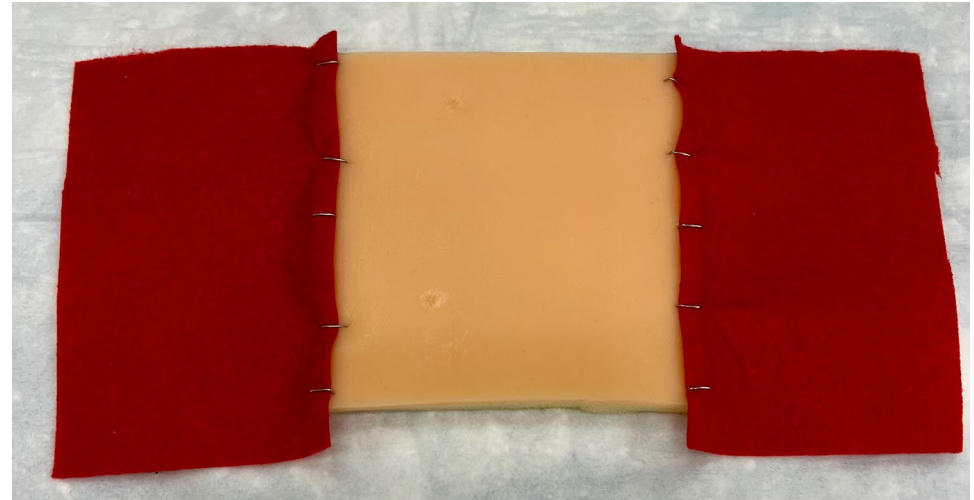


- Core out center
- Silicone 2 pieces together
- Cover in Silicone (2 coats)
- Attach Velcro to sides

Assembly



- Use Silicone to attach neck to head, cover all exposed foam in silicone



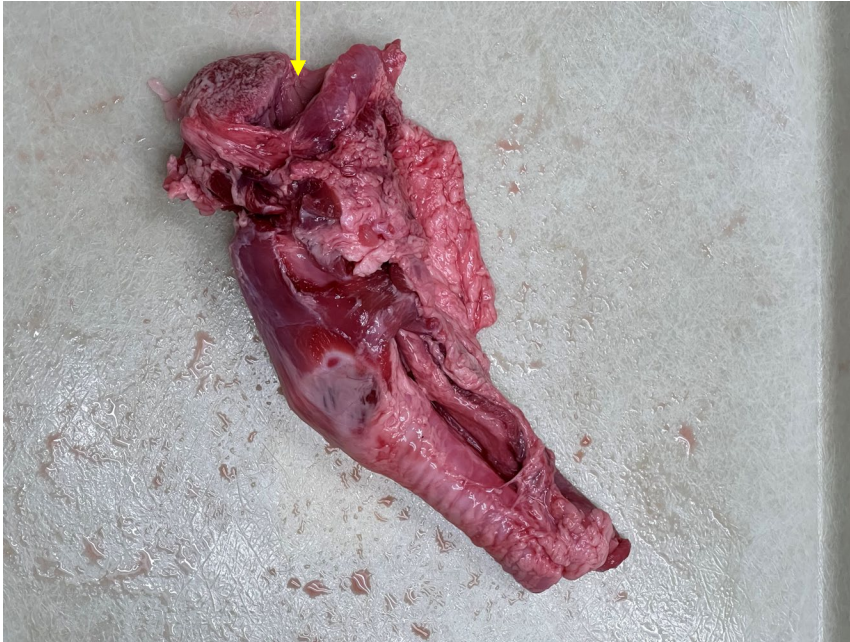
- Use a skin stapler to attach felt to skin (can use pig skin or fake skin)

Pig Trachea Prep

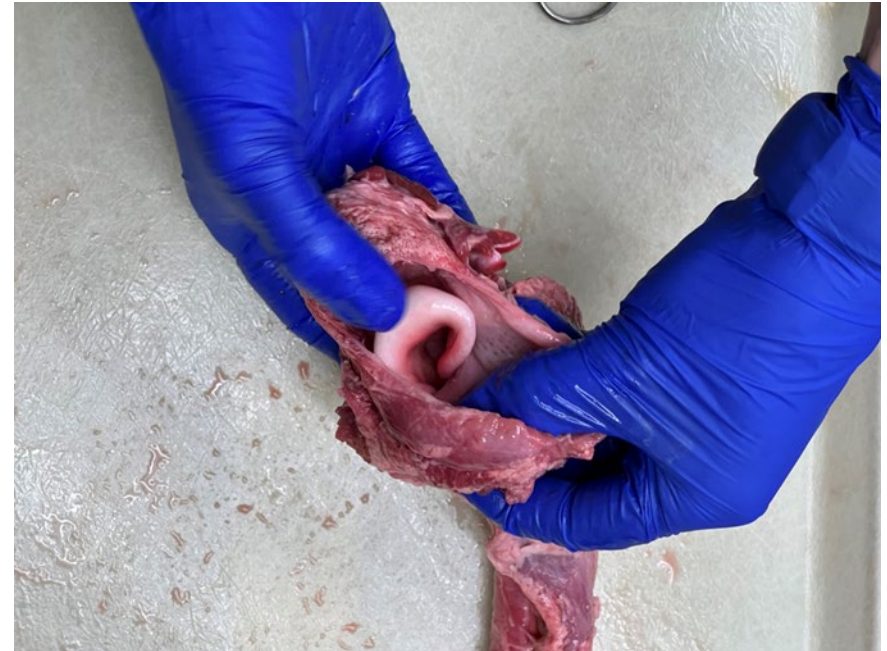
- The critical part to identify is the cricothyroid cartilage.
- Avoid cutting any tissue around this area.



Pig Trachea Prep

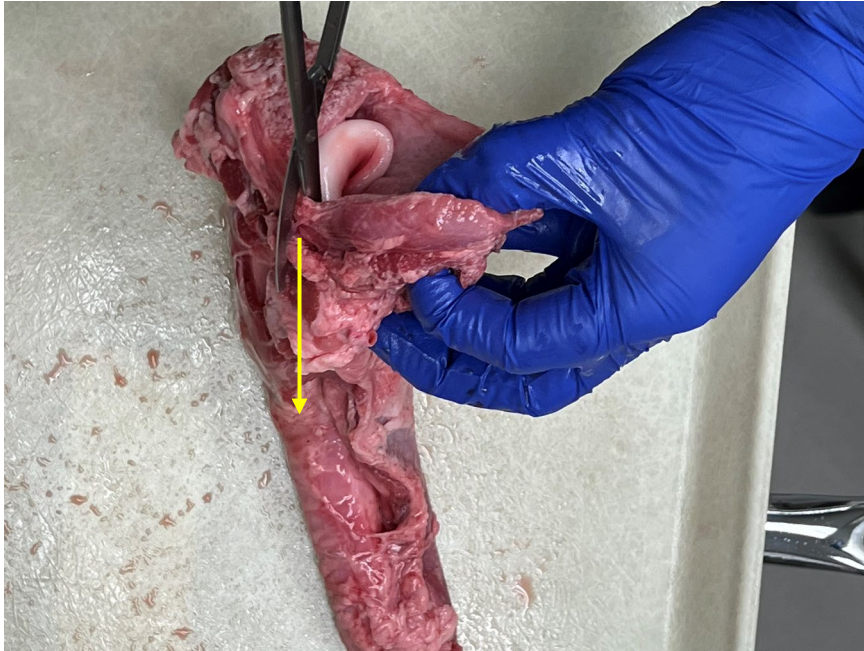


- Locate the top of the larynx



- Find the opening and locate the epiglottis

Pig Trachea Prep



- Cut along the larynx towards the trachea to remove excess tissue



- Dissect soft tissue up the side of the trachea to the larynx

Pig Trachea Prep



- Cut soft tissue across the top of the larynx including the epiglottis



- Trim the bottom of the trachea and the top of the larynx

Pig Trachea Prep



Assembly For Use



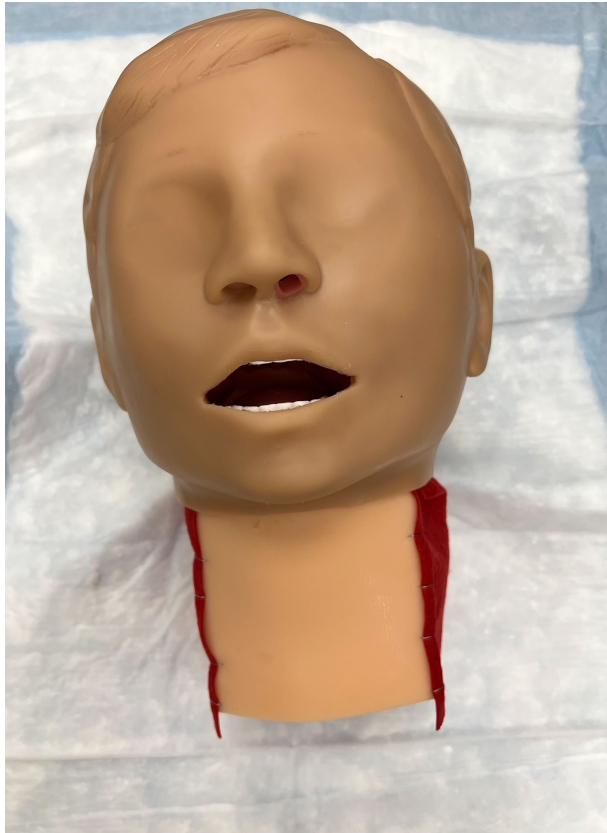
- Wedge prepped trachea into slot



- Cover with skin/felt
- Attach felt to velcro

Alternatives:

Repurposing old trainers



Current Procedures

- Percutaneous Cricothyrotomy
 - Needle
 - Melker
- Open Cricothyrotomy
 - Scalpel/Bougie
- Tracheostomy



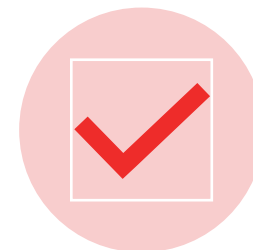
Benefits



CONFIDENCE



MUSCLE MEMORY



STAYING CURRENT WITH
UPDATED PRACTICES

Applications & Learners

- Initial Skills Training
 - Surgical Residents – PGY1
- Initial & Continued Training
 - EM Residents – PGY 1-5
- Competency Assessment
 - Surgical Residents – PGY1/2
- Skill Retention
 - Practicing Physicians & Surgeons
 - ICU Fellows



Model Costs

Reusable Model

- Rubber Head (Amazon) **\$13**
https://www.amazon.ca/dp/B07N1DTWZ4?psc=1&ref=ppx_yo2ov_dt_b_product_details
- Apple Corer (Amazon) **\$14** – one time cost
https://www.amazon.ca/gp/product/B09Y58VCSL/ref=ppx_yo_dt_b_asin_title_o05_s00?ie=UTF8&psc=1
- Type 1 Clear Household Silicone **\$12** – good for multiple necks
[All-Purpose Silicone Sealant, Indoor/Outdoor Window & Door Waterproof Caulk, Clear, 299-mL | Canadian Tire](#)
- Foam Donut (Cardinal Health) **\$3**
<https://www.cardinalhealth.com/en/product-solutions/medical/surgical/or-positioning/devon-foam-positioners.html>

GE

Consumables

- Skin Stapler **\$5** – good for multiple
- Felt (dollar store) **\$3** for a roll – good for multiple
- Pig Skin (harvested from research pigs) **\$0**
- Pig Tracheas (collected by VetMed from abattoirs) **\$5-10**

Thank you!

Questions?

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www.ucalgary.ca/atssl