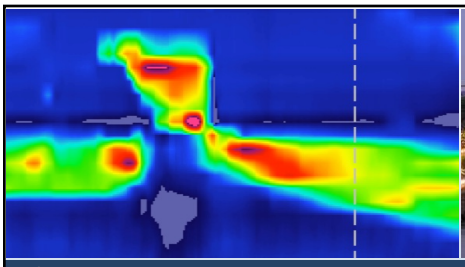

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The Charleston Pharyngoesophageal Manometry Program • April 7-8, 2023 • Charleston, SC

The Nuts & Bolts of Pharyngoesophageal Manometry

Haley Sibley, MD

Evelyn Trammell Institute for Voice and Swallowing

Department of Otolaryngology – Head and Neck Surgery

Medical University of South Carolina

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EQUIPMENT AND SETUP

- Consent
- Pre-Anesthesia Equipment
  - Cotton pledget
    - Lidocaine 4% for anesthesia
    - Oxymetazoline for decongestion
  - Benzocaine spray (esophageal only)
  - Nasal speculum
  - Bayonet forceps
- Calibration*
  - Distilled water
  - Shallow flat bottom basin

*Laborie (MMS) system

- Insertion
  - Water soluble lubricant
  - Gloves
  - Water with straw
  - Tape
- During Study
  - Saline/electrolyte sports drink
  - Other consistencies depending on exam
  - Spoon, straw, small cup
- Removal
  - Towel or “chuck” pad
  - Tissues

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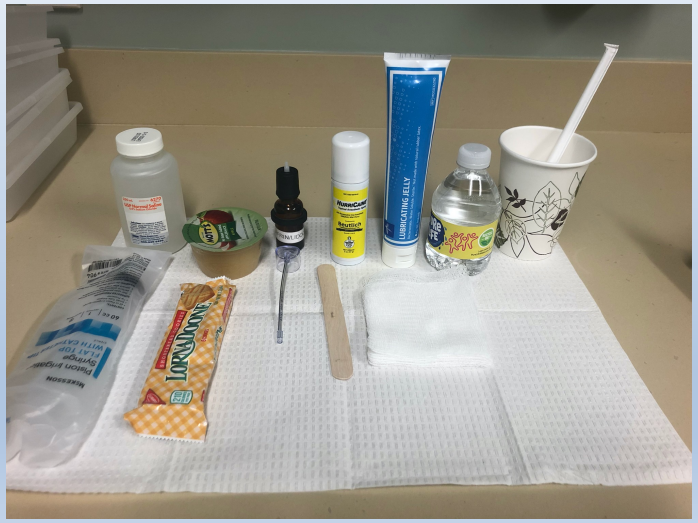
EQUIPMENT AND SETUP



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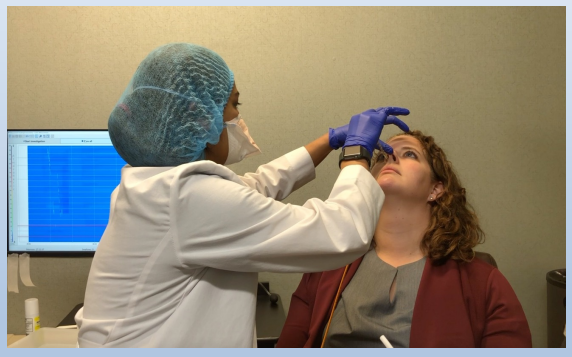
PATIENT POSITIONING

- Pharyngeal
  - Upright
  - Multiple consistencies
    - Dry swallow
    - Thin
    - Pudding
    - Cookie
- Esophageal
  - Positioning
    - Supine
    - Upright
  - Consistency
    - Saline



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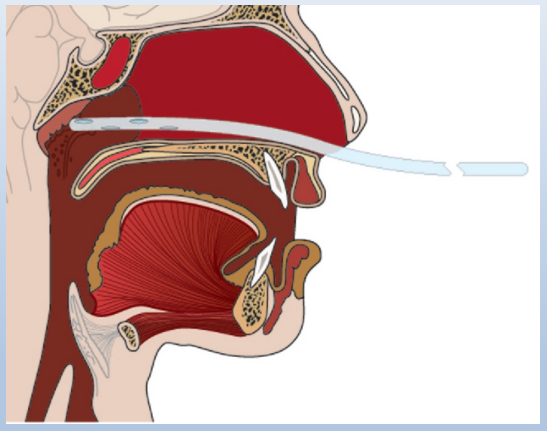
CATHETER PLACEMENT



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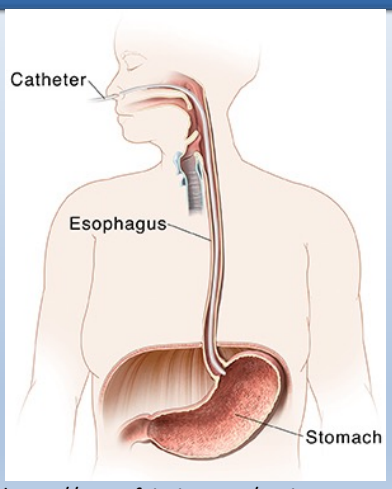

https://www.fairview.org/patient-education/82966

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HIGH RESOLUTION ESOPHAGEAL MANOMETRY STANDARD PROTOCOL
CHICAGO CLASSIFICATION VERSION 4.0©

STUDY PROCEDURE

Study begins in supine position [use supine normative values]
- ≥60 second adaptation period
- Document position with at least 3 deep inspirations
- ≥30 second baseline period
- 10 supine wet (5mL) swallows
- 1 multiple rapid swallow (MRS) sequence (MRS may be repeated up to 3 sequences if failed attempt or abnormal response)

Change position to upright [use upright normative values]
- ≥60 second adaptation period
- Document position with at least 3 deep inspirations
- ≥30 second baseline period
- ≥5 upright wet (5mL) swallows
- 1 rapid drink challenge

If no major motility disorder is found consider the following manometric evaluations
- For high probability of a missed EGJ outflow obstruction: Solid test swallows, solid test meal, and/or pharmacologic provocation
- For suspected rumination/belching disorder: Post-prandial high-resolution impedance observation

If equivocal results are found and/or there is suspicion for an obstruction that does not fulfill criteria for achalasia, consider the following supportive tests
- Timed barium esophagram, preferably with tablet
- Endoluminal functional lumen imaging planimetry (FLIP)

CONSIDERATIONS

Prior to procedure patients should fast for at least 4 hours and informed consent should be obtained. The CCv4.0 Working Group recommends using a solid state high-resolution manometry catheter with less than 2cm sensor spacing with combined impedance sensors. However, the protocol and classification can be performed with water perfused catheters if appropriate normative values are used. Although the protocol designed by the CCv4.0 working group is considered to be the optimal protocol, clinicians can modify this protocol based on limited resources and time as long as normative values are applied and other positions and provocative tests are used appropriately. Physicians choosing to begin the study in the upright position should consider performing 10 upright swallows. **Classification is based on the primary position in which 10 wet swallows are performed, either supine or upright. Assessment of swallows in the secondary position and with provocation provide supportive data**

In addition to Chicago Classification v3.0 metrics, final report should include baseline measures of the esophagogastric junction (EGJ) and symptoms experienced during the study and within 15 seconds of a motility dysfunction.

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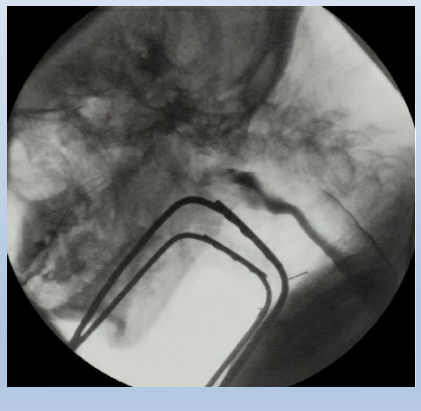
CONTRAINDICATIONS (ADULTS)

- Stenosis, stricture or obstructive mass
- Cognitive/behavioral impairment
- Altered Mental Status
- Hyperactive gag reflex
- Anticoagulation (relative/controversial)



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TROUBLESHOOTING

- **Patient gagging**:

→ Solution: Benzocaine, allow adaptation period, encourage breathing

- **Catheter presence in the larynx**:

→ Solution: catheter retraction, re-position (chin tuck), liquid swallows

- **Inability to pass through the UES/LES:**

→ Solution: L/R head turn, chin tuck; lay supine/sit upright

- **Difficulty swallowing one at a time**:

→ Encourage breathing, allow adaptation period

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SIDE EFFECTS AND COMPLICATIONS

Side Effects

- Minor discomfort
- Sore throat
- Gagging

Complications

- Epistaxis
- Vasovagal reactions
- Laryngospasm
- Injury to pharynx or larynx
- Esophageal Perforation

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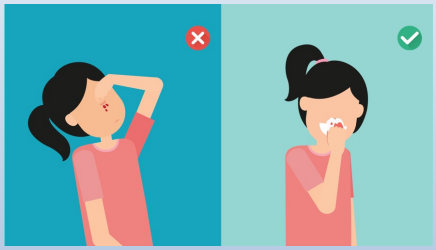
MANAGING COMPLICATIONS: EPISTAXIS

- Generally self limited
- Lean pt forward
- Afrin + pressure (to cartilaginous part of nose)
- If no resolution→may need ENT to pack/cauterize



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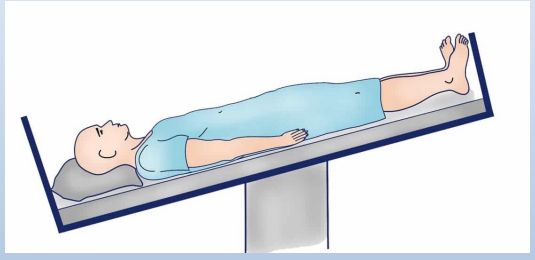
MANAGING COMPLICATIONS: VASOVAGAL SYNCOPE

- Recognize signs early
- Remove probe
- Get help
- Place in Trendelenburg position
- Take vitals, keep in Trendelenburg until blood pressure recovers
- Ammonia ("smelling salts")
- Cooling packs & fan



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MANAGING COMPLICATIONS

- Laryngospasm
  - Avoid contact with vocal folds if possible (chin tuck!)
  - Remove probe & get help
  - Topical or nebulized lidocaine
  - Positive pressure ventilation (bag-mask)

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EFFECT OF TOPICAL ANESTHESIA ON MEASUREMENTS

- Increases cooperation with the examination but not required
- 2017 study (Huckabee): small but significant reduction in max and mean pharyngeal pressure after applying 0.4mL of 2% viscous lido with cotton tip
  - Unclear clinical relevance
- 4% lidocaine & oxymetazoline or neosynephrine (adult)
- Lido and oxymetazoline on cotton pledget→pack nose→limits spread of anesthetic
- In adults: 4.5 mg/kg, up to 300 mg lidocaine without epinephrine
  - 4% lidocaine = 40 mg per ml

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TOPICAL ANESTHESIA AND SWALLOWING

Lester et al (2013) noted higher penetration aspiration scores in anesthetized groups vs. non-anesthetized groups. Anesthesia reduced discomfort and provided better tolerance.

Guiu Hernandez et al. (2017) noted difference in magnitude of pharyngeal swallow with no significant difference in comfort.

Hernandez et al (2020) – noted no significant difference in pharyngeal pressures.

<u>Conclusion:</u>

→ Use anesthesia judiciously

→ It may not always be necessary

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SUMMARY

- Preparation is key
- Be aware of contraindications
- Most patients tolerate procedure well
- Gentle handling of the catheter
- Follow manufacturer's and facility requirements for cleaning and disinfection

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