



# CLINICAL PRACTICE GUIDELINE

## Practice Guideline:

*Esophagogastric Tamponade Tube (EGTT): Assisting with Insertion, Care and Removal*

**Approval Date:**  
August 2024

**Page:**  
1 of 18

**Approved By:**  
Standards Committee  
Professional Advisory Committee

**Supersedes:**  
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### [PART A: PREPARATION](#)

### [PART B: INSERTION](#)

### [PART C: CARE AND MAINTENANCE](#)

### [PART D: TRANSPORTATION](#)

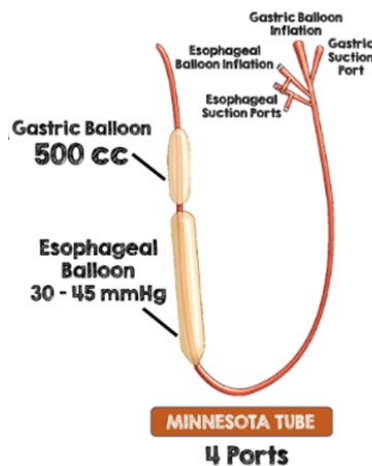
### [PART E: DISCONTINUING TAMPONADE THERAPY & REMOVAL](#)

## 1.0 PURPOSE AND INTENT

- 1.1. Registered Nurses in Critical Care Units and Emergency Departments may assist with insertion, and provide ongoing care for patients requiring EGTT placement.

## 2.0 DEFINITIONS

- 2.1 **Esophagogastric tamponade tube (EGTT):** a tube used in emergency situations to control bleeding from gastric or esophageal varices. The gastric and/or esophageal balloon exerts direct pressure against the varices and provide tamponade. The suction lumens allow the evacuation of accumulated blood from the stomach or esophagus and intermittent instillation of saline to help evacuate blood or clots.



Picture: from Bridwell, R. E. et al., 2022

- 2.2 **Variceal bleeding:** Esophageal and gastric varices develop because of portal hypertension and vascular congestion. Rupture of the dilated veins may result in gastrointestinal hemorrhage and hypovolemic shock. In severe cases and without immediate bleeding control, death may occur.

## 3.0 GUIDELINES

- 3.1 Inclusion criteria:

- Significant hemodynamic instability (i.e.: unable to undergo endoscopy or sclerotherapy).
  - Bleeding unresponsive to medical therapy (including endoscopic hemostasis and vasoconstrictor therapy).
  - Primary treatment options for variceal bleeding are unavailable or not timely
- 3.2 Contraindications include:
- Latex allergy
  - Uncontrolled airway (absence of an advanced airway device)
  - Recent esophageal or gastric surgery
  - History of esophageal strictures
- 3.3 Relative contraindications include:
- Hiatal hernia
- 3.4 Complications may arise from balloon misplacement, balloon migration, balloon overinflation, rebleeding, or prolonged use. These include: aspiration, airway or large vessel obstruction, esophageal perforation or rupture, and mucosal ulceration.
- 3.5 It is required that airway intubation occur prior to attempting insertion of the EGTT due to the risk of aspiration and airway obstruction.
- 3.6 Difficult insertion may occur from coiling in the oropharynx or esophagus, and may require the physician / physician delegate to use direct or video laryngoscopy to assist with tube placement.
- 3.7 **Any changes of the gastric balloon volume and esophageal balloon pressure are to be done by the physician / physician delegate.**
- 3.8 **Never deflate / manipulate gastric balloon volume while the esophageal balloon remains inflated.**
- 3.9 **Traction must be maintained while esophageal balloon is inflated.**
- 3.10 EGTT is intended as a temporizing measure until more definitive therapy can be carried out, and is recommended to be used for up to 24 to 48 hours.

#### **4.0 EQUIPMENT**

- 4.1 **Facility specific insertion trays / kits may be uniquely organized.**
- Esophagogastric Tamponade tube
  - Basin
  - 4 – Clamping Forceps (with padding if available)
  - 4 – Gauze (5cm x 5 cm) for forceps if padding is unavailable
  - Pressure Manometer (mmHg or cm H<sub>2</sub>O)
  - Personal Protected Equipment (PPE) such as gloves, gowns, face shield/protection
  - Oral / tonsil suction set up (Yankauer, suction bottle, suction tubing)
  - Low intermittent suction set up for 2 drainage lumens – either separate or Y connected (suction regulators, cannisters, suction tubings, Y connector)
  - 2 - Catheter adaptors (Luer-Lock female end tapering to a graduated end) - optional
  - 2 - Stopcocks
  - 2 - 50 mL Catheter tipped syringe
  - 2 - 50 mL Luer-Lock syringe

- Water soluble lubricant
- Measuring tape
- 500 mL bottle saline for irrigation
- Tape
- Scissors
- Permanent black marker (single patient use)
- Orogastric tube (OGT) or nasogastric tube (NGT) for esophageal drainage (Add to Senstaken-blakemore tube only)

#### 4.2 To maintain ordered traction to established EGTT:

- Bedframe balanced suspension traction – pulley system
- Bed IV Pole (optional)
- Rope (3 meter) or roll of gauze bandage
- 500 gram weight or 500 mL saline bag as equivalent
- 1 kg weight or 1000 mL saline bag as equivalent

## 5.0 PROCEDURE

### PART A: PREPARATION

### PART B: INSERTION

### PART C: CARE AND MAINTENANCE

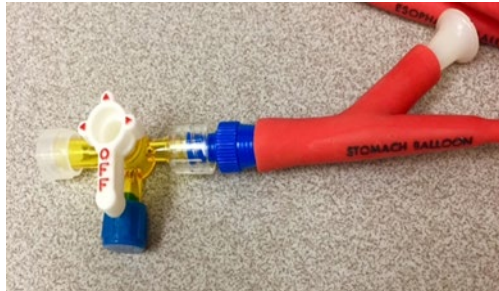
### PART D: TRANSPORTATION

### PART E: DISCONTINUING TAMPONADE THERAPY & REMOVAL

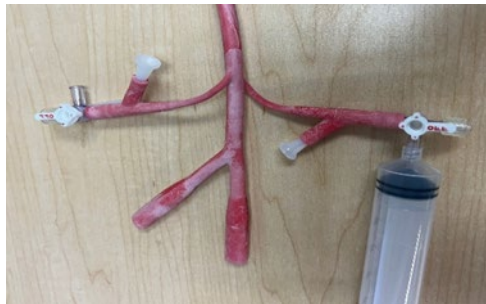
#### **PART A: PREPARATION**

1. Perform hand hygiene before direct patient contact and subsequently as clinically indicated. Follow Routine Practices and perform point of care risk assessment (PCRA) to determine use of appropriate PPE.
2. Explain purpose for EGTT insertion to the patient and family where applicable.
3. Consider utilizing 2 nursing staff for procedure. Person 1 will remain clean with no patient contact, while person 2 will have contact with patient and assist the physician / physician delegate with preparation and insertion.
4. Transfer patient to bed / stretcher compatible with bedframe balanced suspension traction – pulley system if available, as time permits or as soon as possible after tube insertion.
5. Set up bedframe balanced suspension traction – pulley system.
  - 5.1. If bedframe balanced suspension traction – pulley system is not available, hang ordered weight over stationary IV pole at the foot of bed, ensuring it is free hanging and aligned straight to where EGTT exits the mouth or nose.
6. Set up oral / tonsil suction at bedside.
7. Set up suction apparatus' for esophageal and gastric drainage.
  - 7.1. Ensure suction is adjusted to less than 150 mmHg.

- 7.2. Use a Y connection if limited suction sources are available.
8. Connect stopcock to catheter adaptor. Insert stopcock/adaptor apparatus into gastric balloon inflation lumen. Leave the manufacturers side lumen plug in place.
- 8.1. If the catheter adaptor is not available or is too narrow, the stopcock (female Luer connection) can be directly inserted into the EGTT balloon inflation lumen.



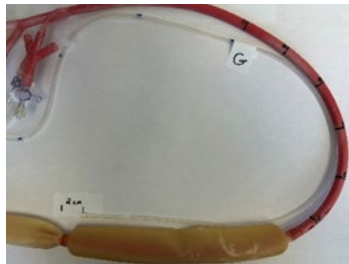
Stopcock with adaptor



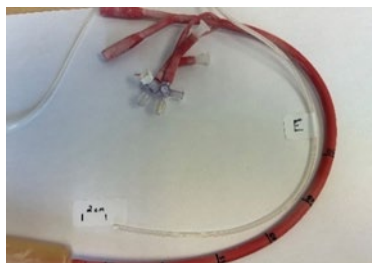
Stopcock direct attachment

- 8.2. Regardless of equipment used to for balloon inflation, ensure side port remains occluded with the manufacturers plug. [See Appendix B.](#)
9. Connect second stopcock to second catheter adapter.
10. Attach second adaptor to **esophageal balloon inflation lumen**. Leave the manufacturers side port plug in place.
- 10.1. If the catheter adaptor is not available or is too narrow, the stopcock (female Luer connection) can directly inserted into the EGTT balloon inflation lumen. [See Appendix B.](#)
11. Test gastric and esophageal balloon integrity as follows:
- 11.1. Attach 50 mL Luer-lock syringe to **gastric balloon lumen** stopcock, ensuring stopcock is off to the side port.
- 11.2. Inflate the **gastric balloon** in increments of 100 mL with air. Turn stopcock off to EGTT and measure the pressure using a pressure manometer device. Ensure the manufacturers plug remains in place to obstruct the alternate lumen.
- 11.3. Measure the pressure at each 100 mL increment.
  - Pressure value is used to establish a baseline to compare to an insertion value later on. There is no normal value.
- 11.4. Clamp gastric **balloon lumen** of EGTT with gauze padded forceps at max. inflation volume.
  - The suggested max. inflation volume varies per EGTT.

- 250cc for Sengstaken-Blakemore tube
  - 500cc for Minnesota tube
- 11.5. Repeat above steps with **esophageal balloon**, to a maximum pressure less than 45 mmHg (61 cmH<sub>2</sub>O). Ensure the manufacturer's plug remains in place to obstruct the side port.
  12. Submerge inflated balloons in basin filled with water. If air bubbles are observed, or if there are any signs of balloon deflation dispose of EGTT and obtain replacement.
  13. Remove EGTT from basin.
  14. Actively deflate both balloons completely with syringe and reclamp.
  15. For an EGTT **without** esophageal suction lumen (i.e. Blakemore) and at the direction of the physician / physician delegate, prepare gastric tube (NGT / OGT) for esophageal drainage by performing the following measurements:
    - 15.1. Some EGTT's do not have an esophageal suction lumen. If the patient requires esophageal drainage / suction, a separate NGT / OGT will need to be inserted separately ([Insertion Step 20](#)).
    - 15.2. Hold the gastric tube (NGT / OGT) parallel to the EGTT with the tip of the gastric tube 2cm above the gastric balloon. Using the permanent marker, mark the gastric tube 'G' at the level of the 50cm measurement on the EGTT.



- 15.3. Hold the gastric tube (NGT / OGT) parallel to the EGTT with the tip of the gastric tube 2cm above the esophageal balloon. Using the permanent marker, mark the gastric tube 'E' at the level of the 50cm measurement on the EGTT.



## PART B: INSERTION

1. Perform hand hygiene before direct patient contact and subsequently as clinically indicated. Follow Routine Practices and use of appropriate PPE.
2. Prepare and administer sedation as ordered. Ensure patient has received adequate sedation to tolerate insertion of EGTT and minimize agitation which may lead to balloon displacement.

3. Position patient supine with head of bed greater than or equal to ( $\geq$ ) 30° unless contraindicated.
  - 3.1. Positioning facilitates passage into the esophagus and reduces the risk of aspiration.
4. Record baseline vital signs: heart rate (HR), blood pressure (BP), respiratory rate (RR), oxygen saturation (SpO<sub>2</sub>), tidal volume (VT), and peak airway pressure if applicable.
5. Monitor continuously throughout procedure and document HR, BP, RR, and SpO<sub>2</sub> every 5 minutes. Passage of a large bore tube may impair the airway, cause vagal stimulation with bradycardia, or predispose a patient to vomiting and potential aspiration.
6. Assist physician / physician delegate with topical anaesthetic application to posterior pharynx or nasal passage (depending on planned insertion site).
7. Apply water soluble lubricant to distal 15 cm of the EGTT.
8. Assist physician / physician delegate with insertion of the EGTT to the entire length of the tube or at a minimum 50 cm (marked on the tube by manufacturer).
9. Assist physician / physician delegate with **initial** inflation of **gastric balloon** as follows:
  - 9.1. Using a 50 mL Luer-Lock syringe, instill 50 mL air into the **gastric balloon lumen** via the stopcock.
    - If resistance is felt, immediately stop and notify physician / physician delegate. Remove all air, and assist physician / physician delegate with repositioning of EGTT. Ensure the manufacturers plug remains in place to obstruct the side port.
  - 9.2. Close stopcock to **gastric balloon lumen** of EGTT and clamp tubing with gauze padded forceps. Remove syringe.
    - Clamping the balloon lumen tubing prevents air leaking from the balloon.
10. Obtain portable abdominal X-ray to confirm placement. Direct confirmation of gastric balloon placement in the stomach allows for the continuation of the insertion procedure.
11. Assist physician / physician delegate to complete inflation of the **gastric balloon** as follows:
  - 11.1. Attach the pressure manometer to the side port of the **gastric balloon stopcock**.
  - 11.2. Inflate the gastric balloon with air in 100 mL increments (100, 200, 300, etc.) measuring the pressure at each increment. Ensure the manufacturers plug remains in place to obstruct the side port.
  - 11.3. Compare the pressure to that measured during Preparation Step 10 at each 100 mL increment.
    - A difference of 15 mmHg (20 cmH<sub>2</sub>O) pressure compared to Preparation Step 10 (10.3) (page 5) indicates that the gastric balloon remains in the esophagus and further inflation could cause esophageal distention or

rupture. In this case, the balloon should be deflated and repositioned into the stomach.

- 11.4. Repeat 11.2 & 11.3 until the suggested maximum **gastric balloon** inflation volume is instilled.
  - The suggested max. inflation volume varies per EGTT.
    - 250cc for Sengstaken-Blakemore tube
    - 500cc for Minnesota tube
- 11.5. Clamp tubing **gastric balloon lumen** with 2 gauze padded forceps immediately after the junction with the side port (closer to patient).
  - Clamping the balloon lumen tubing prevents air leaks from the balloon.



- 11.6. Close stopcock to **gastric balloon lumen** of EGTT and remove syringe.
12. Assist physician / physician delegate with gastric lavage:
    - 12.1. Physician will instill room temperature saline in **gastric aspiration lumen** using the 50 mL catheter-tipped syringe.
    - 12.2. Physician / physician delegate will gently aspirate, assessing amount and quality of fluid withdrawn.
    - 12.3. Discard aspirated fluid.
    - 12.4. Repeat above steps until clear of clots.
      - Gastric lavage prevents clots from occluding the EGTT and allows for assessment of ongoing bleeding after traction is applied.
  13. Attach suction tubing to **gastric aspiration lumen** and adjust intermittent suction to 60–120 mmHg.
  14. Attach suction tubing to **esophageal aspiration lumen** (if available) and ensure continuous suction is set to 120 – 200 mmHg.
  15. Physician/ physician delegate will pull EGTT back until resistance is felt to tamponade gastric bleeding. Most bleeding occurs from the location of the gastroesophageal junction. Positioning of the **gastric balloon** at the gastroesophageal junction creates the tamponade effect.

16. Assist physician / physician delegate with attaching EGTT to rope set through the traction – pulley system with ordered weight (0.5 – 1 kilogram) for traction. See sample set ups in [Appendix A](#).
  - If weights are not available, 500 mL or 1000 mL IV crystalloid solutions may be substituted.
  - If bedframe balanced suspension traction – pulley system is not available, hang ordered weight over stationary IV pole at the foot of bed, ensuring it is free hanging and aligned straight to where EGTT exits the mouth or nose.
17. Using a permanent marker, mark the EGTT at point of exit from mouth or nose to identify insertion depth.
18. Obtain repeat portable abdominal X-ray to confirm completely inflated **gastric balloon** remains in the stomach.
19. If bleeding continues, assist physician / physician delegate with inflation of **esophageal balloon** as follows:
  - 19.1. Attach pressure manometer to stopcock of **esophageal balloon lumen**.



- 19.2. Open stopcock to pressure manometer.
- 19.3. Compress bulb repeatedly until **esophageal balloon inflation** achieves a pressure of 35-45 mmHg (47 - 61 cmH<sub>2</sub>O) as prescribed by the physician / physician delegate.
  - **Use minimum pressure necessary to tamponade bleeding, up to maximum of 45 mmHg (61 cmH<sub>2</sub>O).** Higher pressures in the esophageal balloon may lead to ulceration or necrosis of esophageal tissues.
- 19.4. Clamp **esophageal balloon lumen** with 2 gauze padded forceps immediately after the junction with the plugged side port (closer to patient).
  - Double clamping the balloon lumen tubing prevents air leaks from the balloon.





- 19.5. Close the stopcock apparatus to the **esophageal balloon lumen** and remove syringe.
  - The majority of variceal bleeds occur at the lower esophageal sphincter and are tamponaded by the gastric balloon. The esophageal balloon inflation may not be required.
20. If using an EGTT **without** esophageal suction lumen (i.e. Blakemore), at the direction of the physician / physician delegate, insert a gastric tube (NGT / OGT) just above the esophageal or gastric balloon depending upon which is inflated to remove secretions that accumulate above that balloon.
  - The gastric tube (NGT / OGT) was previously prepared with a “G” to identify the depth for above the gastric balloon and a “E” to identify the depth above the esophageal balloon in [PREPARATION Step 15](#).
21. Remove PPE and perform hand hygiene after completing task.

### PART C: CARE AND MAINTENANCE

1. Maintain patient with head of bed greater than or equal to 30° (unless contraindicated).
2. Ensure traction is in proper alignment and free hanging at all times. After the initial 24 hours, physician / physician delegate will reassess need for traction on a daily basis.
  - 2.1. **Traction is not to be removed while esophageal balloon is inflated.**
3. Patient may be turned every 2 hours, provided they are hemodynamically stable and traction alignment is maintained.
4. Assess exit marking hourly and with every change in patient position. Notify physician / physician delegate if tube has migrated out 3 cm or greater.
5. Monitor and document assessment of oral and nasal mucosa every 2 hours.
6. Provide oral and nasal care (as applicable) every 4 hours per standard practice and as needed.
  - 6.1. Nasal care consists of removing dried blood or secretions from the nasal orifice and proximal nares and applying a water soluble lubricant to keep the mucosa moist.

- 6.2. Frequent reassessment is required for signs of mucosal ulceration to the oropharynx, nose, or lips.
7. Monitor and document **esophageal balloon pressure** hourly if inflated, as follows:
- 7.1. Connect pressure manometer to closed stopcock on **esophageal balloon lumen**.
  - 7.2. Remove double clamps on **esophageal balloon lumen**.
  - 7.3. Open stopcock to pressure manometer and measure pressure at end-expiration.



- The pressure necessary to tamponade bleeding is usually 35 – 45 mmHg (47-61cmH<sub>2</sub>O), up to maximum of 45 mmHg (61 cmH<sub>2</sub>O).
  - Value may be lower as tolerated or in the absence of bleeding ([see Step 8](#) below).
- 7.4. Close stopcock.
  - 7.5. Reclamp **esophageal balloon lumen** with 2 gauze padded forceps.



- 7.6. Remove pressure manometer.
8. If no evidence of bleeding, assist the physician / physician delegate to decrease the **esophageal balloon pressure** by 5 mmHg (7 cmH<sub>2</sub>O) every 3 hours until the pressure is 25 mmHg (34 cmH<sub>2</sub>O) by performing the following:
- 8.1. Repeat steps above ([7.1 – 7.3](#)) to attach and monitor **esophageal balloon pressure**.

- 8.2. Slowly release air until desired pressure is attained.
- 8.3. Close stopcock.
- 8.4. Reclamp **esophageal balloon lumen** with 2 gauze padded forceps.
- 8.5. Remove pressure manometer.
- 8.6. **If signs of bleeding are observed**, assist physician / physician delegate with re-inflation of esophageal balloon by 5 mmHg (7 cmH<sub>2</sub>O) by compressing the pressure manometer bulb repeatedly.
- 8.7. Assess pressure reading at end of expiration.
  - Any manipulations of gastric balloon volume or esophageal balloon pressure are to be done by the physician / physician delegate.
  - Using the lowest pressure to create tamponade effect decreases the risk of necrosis.
- 8.8. Document changes to **esophageal balloon pressure**.
9. If no evidence of bleeding, assist physician / physician delegate with **complete deflation of esophageal balloon every 6 hours** for 15 minutes as follows:
  - 9.1. Repeat steps above ([7.1–7.3](#)) to attach and monitor **esophageal balloon pressure**.
  - 9.2. Note the pre-deflation pressure value prior to releasing all air.
  - 9.3. Press the pressure manometer release valve fully, allowing all air to escape.
  - 9.4. Leave the **esophageal balloon** deflated for 15 minutes. Complete deflation for short durations of time decreases the risk of necrosis.
  - 9.5. Once time has lapsed or if signs of rebleeding occur, assist physician / physician delegate with re-inflation of **esophageal balloon** by compressing the pressure manometer bulb until the pressure tamponades and bleeding stops (45 mmHg (or 61 cmH<sub>2</sub>O)).
    - Any manipulations of gastric and esophageal balloon pressure are to be done by the physician / physician delegate.
    - Notify physician / physician delegate immediately if any signs of rebleeding occur.
10. Maintain suction to gastric and esophageal aspiration lumens:
  - **Gastric:** Low intermittent (60 -120 mmHg)
  - **Esophageal:** Moderate continuous 120 – 200mmHg)
  - Suction should be similarly applied to alternate NG/OG tube's if inserted separately.
11. Assess drainage hourly. Notify physician / physician delegate if combined drainage (not including flushes) is greater than 100mL per hour.
12. Maintain patency of esophageal and gastric aspiration lumens as follows:
  - 12.1. Irrigate **esophageal aspiration lumen** with 5-10mL of sterile saline every 2-4 hours or as ordered.

- 12.2. Irrigate **gastric aspiration lumen** with 50 mL of sterile saline every 30 minutes or as ordered.
13. Obtain an abdominal x-ray daily as prescribed or if there is indication of EGTT displacement.

#### **PART D: TRANSPORTATION**

1. At a minimum, a Nurse, Respiratory Therapist, and Physician / physician delegate should be readily available throughout patient transport and tests or procedures outside of the ICU or ED.
2. Maintain consistent traction weight during transport: either maintain ordered traction frame on bed, or utilize portable traction device when frame not practical.
3. Minimize interruption of traction therapy and maintain alignment of EGTT tubing.
  - Correct placement of EGTT must be maintained during transportation.
  - Ensure EGTT is secured appropriately and assess exit marking on tube with any patient movement.

#### **PART E: DISCONTINUING TAMPONADE THERAPY & REMOVAL**

1. Perform hand hygiene before direct patient contact and subsequently as clinically indicated. Follow Routine Practices and use of appropriate PPE.
2. Assist physician / physician delegate while they **deflate esophageal balloon** as follows:
  - 2.1. Unclamp esophageal balloon lumen.
  - 2.2. Using a catheter tipped syringe, aspirate air from **esophageal balloon lumen**.
  - 2.3. Observe for signs of rebleeding for 12-24 hours, or as directed by physician / physician delegate. **Up to 50% of varices rebleed after the balloons are deflated.**
  - 2.4. If rebleeding occurs, notify physician / physician delegate immediately and prepare to assist physician / physician delegate with reinflation of the **esophageal balloon** as described in [INSERTION Step 19](#).
    - Deflation and removal of the EGTT should be done in stages allowing time for assessment of rebleeding.
    - **Never deflate gastric balloon while esophageal balloon is still inflated to minimize risk of esophageal tearing.**
3. If no signs of rebleeding after 12-24 hours of esophageal balloon deflation, then assist physician / physician delegate with deflation of the gastric balloon as follows:
  - 3.1. Confirm deflation of esophageal balloon.
  - 3.2. Remove weight from traction – pulley system and untie rope from EGTT.
  - 3.3. Secure EGTT to patients' nose/cheek using tape.

- 3.4. Unclamp gastric balloon lumen.
- 3.5. Using a catheter tipped syringe, aspirate air from gastric balloon lumen.
- 3.6. Observe for signs of rebleeding for 12-24 hours, or as directed by physician / physician delegate. **Up to 50% of varices rebleed after the balloons are deflated.**
- 3.7. If rebleeding occurs, notify physician / physician delegate immediately and prepare to assist with re-inflation of gastric balloon as outlined in [INSERTION Step 9](#).
  - **EGTT placement must be reconfirmed with x-ray prior to full inflation of gastric balloon.**
4. After 12 -24 hours of **gastric balloon** deflation and no observed signs of bleeding, assist the physician / physician delegate while they remove the EGTT device as follows:
  - 4.1. Remove suction from EGTT.
  - 4.2. Using a catheter tipped syringe, actively aspirate any remaining air in **esophageal and gastric balloons**. Clamp balloon lumens prior to removing syringe.
  - 4.3. Remove EGTT and discard.
5. Remove PPE and perform hand hygiene after completing task.

## **6.0 DOCUMENTATION**

Document the following in the Integrated Progress Notes, Flow Sheet or Electronic Patient Record as applicable:

- Date and time that the EGTT was established
- Patient response to procedure
- ECG, vital signs and ventilator settings (baseline, during, and post procedure)
- Type of EGTT inserted
- External length measurement
- Volume of air in the gastric balloon
- Pressure in the esophageal balloon (if applicable)
- Any manipulations performed to the esophageal balloon, resultant pressure, and patient response
- Suction settings and drainage volumes/consistencies
- Any immediate complications and interventions initiated
- Oral or nasal mucosal assessment and interventions performed

## **7.0 REFERENCES:**

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- (2) Bari, V., & Subramanian, R. M. (2022). Practical strategies related to the application of balloon tamponade therapy in acute variceal bleeding. Critical Care Explorations, 4(8), 1-5. <https://doi.org/10.1097/CCE.0000000000000748>

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- (5) Lee, R. (2017). *AACN Procedure Manual for High Acuity, Progressive, and Critical Care*. (7th ed.). Saunders.

## **8.0 PRIMARY AUTHOR (S)**

Critical Care Policy & Procedure Committee

**APPENDIX A: Bedframe balanced suspension systems**



Attaching Bedframe balanced suspension system to bed.



Option A for Bedframe balanced suspension traction / pulley system.



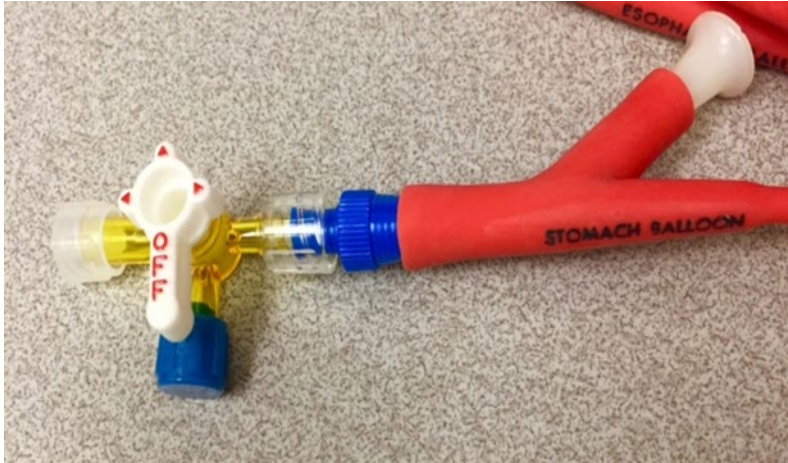
Alternate option for bedframe balanced suspension traction / pulley system.



Alternate option for traction / pulley setup during transport.



**APPENDIX B: Attaching stopcocks to balloon lumens**



Stopcock with catheter adaptor for balloon inflation and pressure monitoring.



Alternate option for direct stopcock insertion for balloon inflation and pressure monitoring.

**APPENDIX C: Applying clamps to maintain balloon volumes / pressures**



Clamping forceps on gastric balloon lumen to maintain volume.



Clamping forceps on gastric and esophageal balloon lumens.