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CCTC Minnesota Procedure: Minnesota Tube, Assisting with Insertion and Care of Patient

Purpose:

To control bleeding from esophageal or gastric varices that have not responded to medical therapy (ie. Sclerotherapy, banding ligation) using a quadruple lumen tube - one lumen for gastric suction, one to inflate an esophageal balloon, one to inflate a gastric balloon and one for esophageal suction.

Consideration:

Recommended that patient be intubated prior to Minnesota tube insertion due to high risk for aspiration.

Contraindications:

1. **Esophageal strictures**
2. **Recent esophageal surgery**

Complications:

1. **Potential for respiratory complications - aspiration, asphyxiation**
2. **Potential for perforation of esophagus**
3. **Necrosis or erosion of esophagus or stomach**

MINNESOTA TUBE INSERTION

Equipment

- Minnesota tube (leave in refrigerator until insertion as a cold, stiff tube is easier to insert)
- kelly clamps X 4
- 60 ml catheter tipped syringe
- wash basin
- 1 litre bottle sterile water (for irrigation)
- water-soluble lubricant
- scissors
- lidocaine spray
- personal protective equipment
- 500 ml bag of IV solution (for weight)
- adhesive tape
- tongue depressor
- black marker
- portable sphygmanometer
- montgomery tie tapes
- traction equipment (from patient equipment room includes 2 pulleys, 2 T-bars and cross bar traction set, 3 metre rope)
- suction regulator and suction tubing X 2

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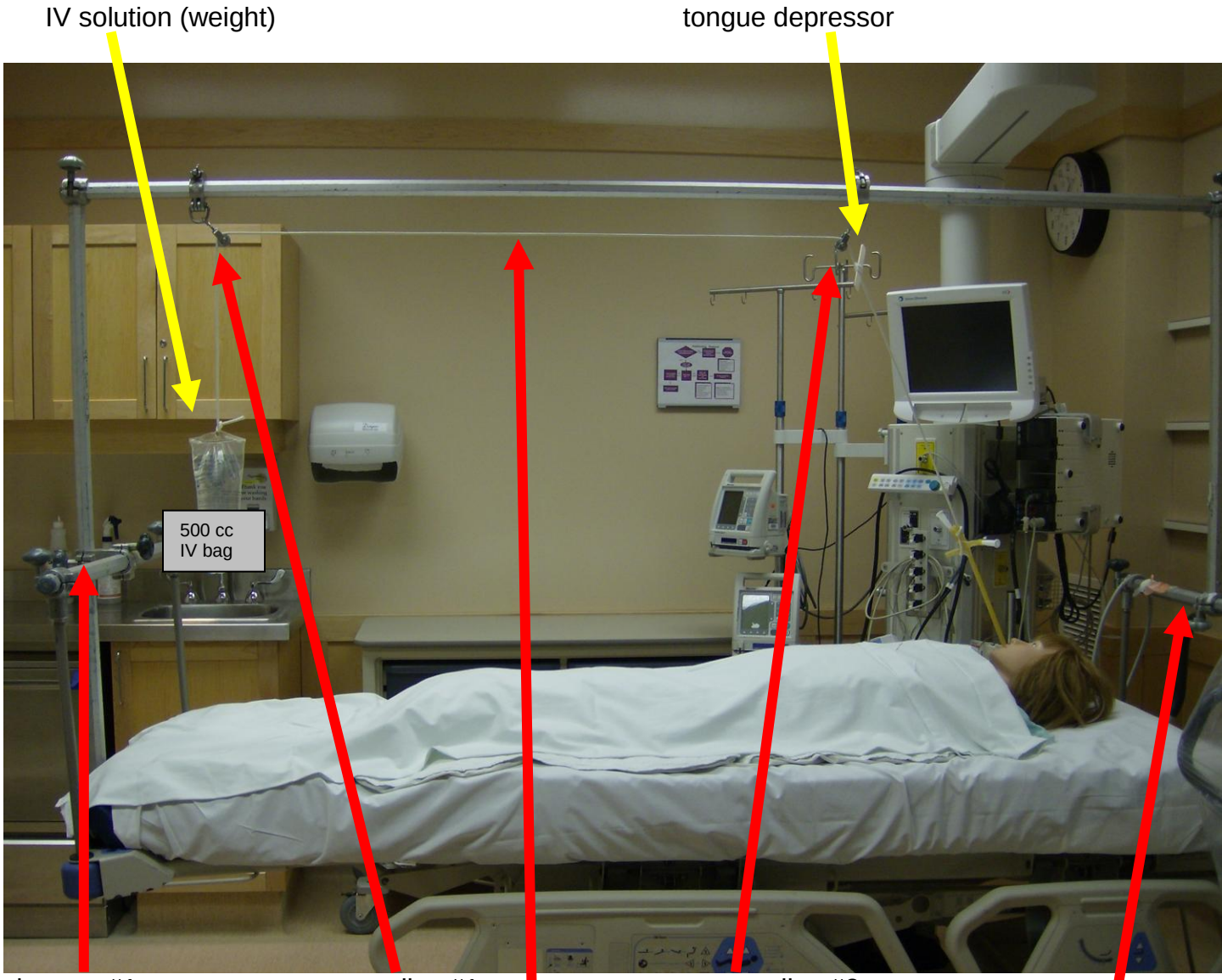
- PPE- non-sterile gloves, gown, facemask and shield

Assisting with Insertion

1. Set up traction on bed (see photo below)



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2. Explain procedure to patient and family.	Decrease anxiety.
3. Perform hand hygiene and don personal protective equipment.	Reduces risk of transmission of microorganisms and secretions. In accordance to the MoHLTC 4 moments of hand hygiene and LHSC infection control policies.
4. Premedicate as ordered. Lidocaine spray may be ordered.	Ensure comfort and tolerance of procedure. Lidocaine may be ordered to anesthetize posterior pharynx.
5. Position patient high Fowler's or left lateral decubitus, if possible	Facilitates passage of tube and reduces risk of aspiration.
6. Observe the physician as he/she tests each balloon before insertion by placing the tube in basin of sterile water. a) Testing the gastric balloon: Ensure esophageal balloon is deflated, clamped and plastic plug (supplied with tube) inserted into port. Connect the sphygmomanometer to the gastric balloon port. Using the second access off the gastric balloon port, inject 100, 200, 300, 400 and 500 ml of air using a catheter-tipped syringe. Make note of the pressure readings at each interval. b) Deflate gastric balloon, clamp and place plastic plug (supplied with tube) into port.	Check for integrity and air leaks Knowing the pressures may prevent unintentional esophageal perforation during insertion. Ensuring balloon is deflated, eases insertion.
6. Lubricate tube including both balloons.	Eases insertion of tube.
7. Observe as physician inserts tube either orally or nasally to 50 cm mark (labeled on tube).	This indicates the tip of the tube is in the stomach as recommended by the manufacturer.
8. Confirm placement of tube as ordered by physician.	May be either xray, fluoroscopy or by endoscopic procedure.
9. Connect both esophageal and gastric suction ports to low intermittent suction.	Prevent regurgitation of gastric contents and saliva.
10. Once placement confirmed, physician will inflate gastric balloon with 100 ml of air. Connect sphygmomanometer to gastric balloon port. Ensure pressure reading is within 15 mm Hg from initial reading.	Readings >15 mm Hg indicate balloon is located within the esophagus which could result in esophageal rupture. The physician must deflate the gastric balloon and reinsert into stomach. This second confirmation of placement is necessary due to the possibility of tube dislodgement when the endoscope is removed.
11. Slowly inflate the gastric balloon with increments of 100 ml of air to a maximum of 500 ml using the	Readings >15 mm Hg indicate balloon is located within the esophagus which

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catheter-tipped syringe. Observe the pressure readings with each 100 ml increment.	could result in esophageal rupture.
12. Clamp the gastric balloon port.	To prevent air leaks from balloon.
13. Pull back gently on tube.	Ensure resistance on the gastroesophageal junction.
14. Confirm placement by abdominal xray after gastric and/or esophageal placement.	
15. Mark placement of tube with a black marker as it emerges from mouth or nose.	Reference point if tube dislodged.
16. If esophageal balloon is to be inflated/deflated this must be performed by MD: a) Connect the sphygmomanometer to the esophageal balloon port. b) Using the second access off this port, inflate the balloon to 35-45 mm Hg using a catheter-tipped syringe. c) Clamp the esophageal balloon port. d) MD must deflate esophageal balloon to adjust tube position.	Esophageal balloon will only be inflated if bleeding continues after gastric balloon inflated. Never inflate esophageal balloon first. Higher pressures may cause esophageal necrosis resulting in chest pain. To prevent air leaks from balloon. To prevent esophageal trauma. Ensure adequate balloon inflation for tamponade. Avoid mucosal injury and necrosis.
17. Apply traction by attaching a 500 ml bag of IV solution to the rope located on the pulley system (see photo). Tie rope to end of the esophageal balloon port.	Traction firmly holds tube in place and places pressure on varices.
18. Tape a tongue depressor 1" from the proximal pulley (see photo).	Acts as a safety to prevent dislodgement of tube.
19. Tape scissors to bed for quick access. Scissors must always accompany patient if transporting. If needed, cut tube closest to insertion site.	In event of esophageal balloon migration resulting in airway occlusion.
20. Remove PPE and perform hand hygiene.	In accordance with the MoHLTC 4 moments of hand hygiene and LHSC infection control policies in an effort to reduce risk of transmission of microorganisms and secretions.
Care of the Patient	
1. Inspect traction q4h and prn.	Ensure traction is being applied appropriately.
2. Inspect the tube placement and insertion site q1h.	Ensure proper placement of tube and for signs of ulceration.
3. Balloon will be deflated and traction released per physician preference within 12-24h by physician	To prevent mucosal necrosis.
4. Oral/nasal care q4h and prn.	To prevent mucosal necrosis.
5. If you are required to transport a patient with the	This maintains some traction on the

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Minnesota tube, remove pulley with the weight attached, and place on the bed near the foot. Scissors must remain with patient at all times.	Minnesota tube while in transport. In event of esophageal balloon migration resulting in airway occlusion.

Removal of Minnesota Tube

1. If no further bleeding, the MD will reduce pressure in the balloon gradually at his/her discretion.	Gradual deflation of balloon allows for the assessment that bleeding has stopped.
2. MD deflates esophageal balloon first.	If gastric balloon deflated first, an inflated esophageal balloon can migrate into the airway.
3. Observe patient for 12 hrs and monitor for signs of rebleeding	
4. If no bleeding reoccurs, release the traction.	Traction must be released before the gastric balloon is deflated.
5. MD will gradually deflate the gastric balloon in increments.	Gradual deflation of balloon allows for the assessment that bleeding has stopped.
6. If bleeding has not reoccurred in 24 hrs, cut the tube proximal to the patient.	Ensures complete balloon deflation before tube removal.
7. If bleeding reoccurs, the MD will inflate the gastric balloon and esophageal balloon if needed.	
8. Gently remove remaining Minnesota tube from the patient and dispose in Biohazard container. Remove PPE and perform hand hygiene.	In accordance with the MoHLTC 4 moments of hand hygiene and LHSC infection control policies in an effort to reduce risk of transmission of microorganisms and secretions.
Documentation	
1. On A/I flowsheet, document reason for insertion, time, site, MD, complications, patient tolerance, traction, confirmation of placement, status of balloon(s) inflation. Any adjustments made by MD to traction or balloon placement. 2. On kardex, date/time, site of insertion, status of balloon(s) inflation. 3.On fluid balance record, hourly output from esophageal and gastric suction.	

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Revised 2008
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References

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