


**GUAM MEMORIAL HOSPITAL AUTHORITY  
TELEMETRY-PROGRESSIVE CARE UNIT POLICY AND PROCEDURE MANUAL**

<b>APPROVED BY:</b>	<b>RESPONSIBILITY:</b>	<b>EFFECTIVE DATE</b>	<b>POLICY NO.</b>	<b>PAGE</b>
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<b>TITLE: NURSE'S ROLE IN TRANSESOPHAGEAL ECHOCARDIOGRAPHY</b>				
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**PURPOSE:**

1. To establish nursing guidelines for the performance of Transesophageal Echocardiography in approved areas within the Guam Memorial Hospital Authority.
2. Cardiac ultrasound provides structural, functional, and hemodynamic information. As a component of cardiac ultrasound, Transesophageal echocardiography (TEE) is an important and highly accurate diagnostic procedure for patients with suspected or known cardiovascular disease, or trauma. Transesophageal echocardiography involves inserting an endoscopic probe into the esophagus, and manipulating the probe through multiple imaging planes to obtain tomographic views of the anatomy and physiology of the cardiac chambers, valves, major vessels, pericardium, and great vessels. Moreover, its clinical applications include, but are not limited to: detection and assessment of endocarditis and its complications, aortic dissection and other aortic pathologies, intracardiac thrombi and other masses, intracardiac and extracardiac shunting, evaluation of valvular disorders including prosthetic valve function, and evaluation of a variety of coronary heart diseases in both children and adults.

**POLICY:**

A Cardiologist may perform "Transesophageal Echocardiography" in the Operating Room, Critical Care, Telemetry, and Progressive Care Units, with an Anesthesiologist and the assistance of a Registered Nurse and Certified Echocardiogram Technologist/Sonographer.

**PROCEDURE:**

**I. NURSING COMPETENCY**

The Registered Nurse must possess current certification in Adult Cardiac Life Support (ACLS) skills and training.

The Registered Nurse must possess a current, validated competency in the administration and monitoring of conscious sedation/analgesia.

**II. NURSING RESPONSIBILITIES**

1. Initial screening
2. Scheduling
3. Patient education
4. Confirming an informed consent

5. Pre-Procedure preparation
6. Monitoring a patient with an Anesthesiologist who administers medication for sedation.
7. Assessment and monitoring
8. Documentation
9. Assistance during procedure
10. Emergency management
11. Recovery
12. Documentation

### **III. EQUIPMENT**

1. Ultrasound imaging system
2. Transesophageal probe (biplane or multiplane)
3. Cardiac monitor
4. Auto or manual blood pressure device
5. Oxygen set-up
6. Pulse oximeter
7. Suction apparatus
8. Crash cart

### **IV. MATERIALS/SUPPLIES**

- |   |  |
|---|--|
| 1. Bite block                                       | 11. EKG electrodes   |
| 2. Nasal canula                                     | 12. Tongue blade   |
| 3. Suction gauge, canister, and catheter (Yankauer) | 13. Intravenous access/Heplock   |
| 4. Emesis basin                                     | 14. Prescribed I.V. fluid  |
| 5. Water-soluble lubricant                          | 15. 0.9% NaCl 10cc syringe (2)<br>with three-way stopcock<br>for contrast (if ordered) |
| 6. Lidocaine or Cetacaine spray and applicator      | 16. Sterile 4x4 gauze  |
| 7. Lidocaine viscous/jelly                          | 17. Alcohol prep pads  |
| 8. Disposable procedure gowns                       | 18. VHS tape/CD  |
| 9. Gloves (sterile/unsterile)                       |  |
| 10. Face mask with protective eye cover             |  |

### **V. PROCEDURE**

#### **A. Preparation phase:**

1. The request for a "Transesophageal Echocardiogram" procedure must be specifically made in writing in the physician's order sheet, by the attending physician or consulting Cardiologist, after a thorough patient medical history is obtained.
2. Assessment of the patient's past and current medical history must include the following risk factors and considerations:
  - a. Esophageal disease (dysphagia, varices, strictures, obstruction)
  - b. Bleeding tendencies (hemophilia, blood thinning/anti-platelet/anticoagulant therapy)
  - c. Pulmonic diseases or distress requiring home oxygen use
  - d. Recent illness
  - e. Prosthetic heart valves (including date and type)
  - f. Isolation precautions (including disease and date tested)
  - g. Drug allergies

- h. Other (i.e. spinal arthritis, radiation to the chest, unstable vital signs, smoke inhalation, pregnancy, dentures)
3. Contraindications to be considered include, but are not limited to the following:
  - a. Uncooperative/unwilling patient
  - b. Dysphagia
  - c. Mediastinal radiation
  - d. Active upper gastrointestinal bleeding
  - e. Penetrating/blunt chest trauma
  - f. Recent gastrointestinal surgery
  - g. Known esophageal pathology (i.e. malignancy, diverticulum, varices, fistulas, stricture)
  - h. Extreme oropharyngeal muscle weakness
  - i. Severe, uncontrolled bleeding disorders, active gastrointestinal hemorrhage
  - j. Unstable respiratory status
  - k. Unstable cervical spine

**\*\*Any abnormal or questionable findings will be discussed with the Cardiologist, attending physician, and patient. Complications and considerations will be resolved or require further testing before the procedure is scheduled (i.e. the need for prophylactic antibiotics, obtaining H&H, PT/PTT levels, barium swallows, etc...)**

4. Scheduling will take into account the availability of the Cardiologist, Anesthesiologist, Certified Echocardiogram Technologist/Sonographer, and Registered Nurse. Consideration must be made of the patient's schedule as well as the availability of an appropriate inpatient, technical, or procedural room in which to perform this procedure.
5. Risks, benefits, and alternatives will be explained and described in detail by the attending physician or Cardiologist. Informed consent for the procedure must be given by the patient and obtained by the Registered Nurse, who must ensure the appropriate permit is signed and well-documented. Clear, concise pre-procedural instructions are provided and reinforced by the Registered Nurse and Certified Echocardiogram Technologist/Sonographer.
6. Patient education will include, but is not limited to the following: purpose and goal of the procedure; procedure for administering conscious sedation/analgesia; sensations patient may experience; assessment and monitoring; pain relief interventions; drugs to be administered (side effects and complications, and their treatment); patient and family's role; physician and nurse's role; post recovery expectations and instructions.
7. Patient is instructed to be NPO at least 4 to 6 hours prior to the procedure. Oral medications may be given with minimal sips of water, if deemed necessary and ordered by the attending physician or Cardiologist.

#### **B. Procedure phase:**

1. The patient will be taken to the appropriate procedure room. The Registered Nurse will reinforce the physician's explanations of the procedure to patient and/or family. The Registered Nurse and physician will confirm that the patient understands the procedure and reaffirms informed consent previously given.
2. The Registered Nurse will prepare the following: fully equipped crash cart, defibrillator, emergency and resuscitative drugs, airway and ventilatory equipment. All supplies and equipment to be used for the administration and monitoring of conscious sedation/analgesia and emergency management are fully stocked and functional.
3. Obtain and document baseline data on patient: temperature; heart rate and rhythm;

respiratory status, including oxygen requirements; depth of respirations, breath sounds, and oxygen saturation; blood pressure; skin condition; level of sedation and mental status; ability to ambulate; weakness and/or sensory loss in extremities (if indicated); and description and intensity of any current painful condition.

4. Electrodes/leads will be attached to the patient for continuous ECG monitoring (via telemetry and/or bedside). Dentures and eyeglasses will be removed. Suction apparatus will be prepared and functioning properly.
  5. Intravenous access will be obtained for the administration of I.V. fluid therapy, conscious sedation/analgesia, and to provide a route for the administration of emergency medication that may be ordered by the Cardiologist.
  6. I.V. antibiotic prophylaxis may be administered by the Registered Nurse to patients at risk for endocarditis as recommended by the American Heart Association, for prosthetic heart valves, and as the physician deems necessary. This requires a physician's order.
  7. Using a protective mask, gown, and gloves, the Cardiologist, Registered Nurse and/or Certified Echocardiogram Technologist/Sonographer will apply the topical anesthetic to the patient's throat to provide a numbing effect to the patient's gag reflex. The patient is instructed to gargle and either swallow or spit the anesthetic agent into an emesis basin.
  8. The Registered Nurse will continue to monitor and document the patient's blood pressure, heart rate, respirations (rate and quality), oxygen saturation, and cardiac rhythm and rate every 3-5 minutes. Any deviations from the patient's baseline is documented and reported to the Cardiologist immediately.
- \*\*A one-to-one RN to patient ratio will be maintained during the administration of conscious sedation/analgesia. This means that the nurse will have no other responsibilities during the procedure and will not leave the patient unattended, or engage in tasks that will compromise conscious monitoring.**
9. The Anesthesiologist will administer sedation/analgesia.
  10. The patient will be closely monitored and evaluated for a therapeutic response, and should be comfortable but sufficiently alert and responsive to follow instructions. Moreover, optimal sedation is achieved when the patient responds to physical and verbal commands, is not anxious or afraid, has minimal changes in vital signs, experiences acceptable pain relief, and is cooperative during the procedure.
  11. The patient will be positioned into a comfortable left lateral decubitus position facing the examiner, unless otherwise ordered. A pillow or wedge may be used to support patient's back.
  12. The Registered Nurse will assist in maintaining a patent airway through optimal positioning, oral suctioning, and administering supplemental oxygen via nasal canula.
  13. The patient's chin will be positioned with the neck slightly flexed, and a bite guard will be inserted into the patient's mouth by the Cardiologist. The Registered Nurse or Certified Echocardiogram Technologist/Sonographer will assist in aseptically applying a water-soluble lubricant to the tip of the TEE probe.

14. The Cardiologist will carefully insert the TEE probe through the bite guard and into the patient's throat, while asking the patient to swallow. The TEE probe is advanced at a distance/length deemed safe, appropriate and optimal by the Cardiologist (usually 30 to 50 cm). The Cardiologist will maneuver the TEE probe within the esophagus to obtain visual images of the heart and great vessels. These images are recorded on VCR or disc.
15. The Registered Nurse will proceed with the physiologic monitoring of the patient for the entire duration of the procedure including level of sedation, mental status, and pain rating every 5 minutes, and skin color and condition every 10 minutes.
16. The Registered Nurse will continue to assist with suctioning, reinforce the physician's instructions, and offer emotional support, reassurance, and encouragement.
17. After the procedure is completed, the TEE probe will be removed gently from the patient and placed in a protective container for proper disinfection by the Certified Echocardiogram Technologist/Sonographer, as per institutional guidelines. The TEE probe is examined for evidence of bleeding, cracks or tears.

**C. Recovery phase:**

1. The patient will be kept NPO until gag reflex returns.
2. The Registered Nurse will examine the patient's mouth and pharynx for any abnormalities and report unusual findings to the physician.
3. The Registered Nurse will regulate any ordered continuous I.V. fluid infusion. Thereafter, a patent I.V. access will be maintained to deliver emergency medications as indicated, once I.V. fluids have been discontinued.
4. The Registered Nurse will continue to monitor and document the following: ECG, blood pressure, oxygen saturation.
5. The Registered Nurse will continue to assess and document vital signs, skin condition, level of sedation, mental status, and pain every 15 minutes for at least 60 minutes after the last sedative or analgesic drug dose is given.
6. The Registered Nurse will immediately report any emergent deviation in the patient's baseline condition to the Cardiologist and/or attending physician, including the following signs/symptoms:
  - a. Respiratory compromise (laryngospasm, hypoxia, bronchospasm)
  - b. Chest pain and/or tightness
  - c. Arrhythmias
  - d. Oropharyngeal bleeding
  - e. Nausea and/or vomiting
  - f. Prolonged sedation
  - g. Transient hypotension/hypertension
  - h. Fever
7. The Registered Nurse will continue routine monitoring and assessment of the patient, provided the post-procedural course remains uneventful.
8. The Registered Nurse will review post-procedural instructions with the patient and Family.

## **VI. DOCUMENTATION**

Nursing documentation should include the following:

- a. Date and time of procedure
- b. Initial patient assessment
- c. Pre- and post-procedure patient and family education
- d. Signed informed consent
- e. Vital signs, pulse oximetry, neurologic status, and pain evaluation immediately prior to sedation, during the procedure and post-procedure
- f. Medications administered and their effectiveness
- g. Assessments of gag, swallow, and cough reflexes
- h. Time of probe insertion and removal
- i. Characteristics of any secretions obtained when suctioned
- j. Post-procedure totals for medications and fluid given
- k. Occurrence of unexpected outcomes
- l. Nursing interventions