

## GENERAL ULTRASOUND THYROID EXAM

### PURPOSE:

1. To determine the presence or absence of disease.
2. To identify and quantitate pathology, which may be present by evaluating characteristics, organs and vessels for focal or diffuse abnormalities
3. To improve patient outcomes by identifying abnormalities and disease, categorizing severity, and planning for interventional and/or medical correction.

### PROCEDURE:

1. The complete study may/may not include Real Time, Doppler or Color interrogation.
  - a) A complete thyroid study includes the right lobe, the left lobe, and the isthmus of the thyroid gland.
  - b) A complete parathyroid study includes two parathyroid glands on each side.  
(Note: The two parathyroid glands on each side of the thyroid may not always be visualized).
2. No patient preparation is required for these tests.
3. Test results with patient history information will be kept in a file in the department with the referring physician receiving an interpretation report.
4. At conclusion of test sonographer will complete:
  - a) Appropriate technologist worksheet with findings
  - b) Complete appropriate charging/billing information
5. Call preliminary report as indicated. (*See diagnostic criteria section*)

### STATEMENT OF INDICATIONS: One or more of the following indications must be present

1. Palpable neck masses
2. Abnormalities detected on other imaging examinations
3. Enlarged thyroid gland
4. Thyroid carcinoma
5. High risk patients for occult thyroid malignancy
6. Follow-up of thyroid nodules on medical suppression therapy
7. Enlarged parathyroid gland
8. Elevated serum calcium levels
9. Suspected primary or secondary hyperparathyroidism
10. Post parathyroid surgery or ablative therapy
11. Autologous parathyroid implants localization
12. Location for biopsy, ablation, or other interventional procedures.
13. Additional indication maybe used following ICD guidelines

### EQUIPMENT:

1. Real-time scanner using:
  - a) Linear (straight or curved) transducers (5MHz or greater)- wide near field
2. Doppler
3. Color Doppler
4. Ultrasound acoustic gel
5. Appropriate patient drape

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6. Towels
7. Appropriate cleaning solution for transducer

### PROCEDURE FOR THYROID ULTRASOUND:

1. The patient should be in the supine position with the neck extended by cloth, roll or bolster.
  - a) If the neck is thin and the thyroid very superficial, an offset gel pad may help visualization, and improve detail.
  - b) Patient swallowing raises the thyroid gland in the neck and may be helpful to image the lower poles.
  - c) Have the patient point out a palpable lump or a tender spot.
2. Apply ultrasound gel to the patient's neck and begin by placing the transducer transversely in the midportion of the neck until the thyroid tissue is identified (use the carotid artery and jugular vein as landmarks).
3. Make sure the texture is uniform bilaterally. A dual linear format is helpful in observing texture differences.
4. Scan anteriorly and image the isthmus, which connects the right and left lobes of the thyroid gland. (Note: it is important to use light pressure on the neck, otherwise tissue becomes compressed, or a small lesion can become displaced).
5. Scan to the right of isthmus and image the right lobe of the thyroid gland.
6. Scan anteriorly and image the superior pole of the right lobe, above the level of the isthmus.
7. Scan back down to the level of the isthmus and image the mid-pole. Measure the transverse dimension of the right lobe.
8. Scan slightly posteriorly and image the inferior portion of the right lobe of the thyroid, below the level of the isthmus.
9. In sagittal, locate the right carotid artery and scan medially to the right lobe of the thyroid and measure.
10. Image the medial, mid and lateral portions of the right lobe and measure mid thyroid
11. Scan the left lobe of the thyroid in transverse and sagittal following the same protocol as above.

### PROCEDURE FOR PARATHYROID:

1. Scan posterior to the thyroid gland to locate the parathyroid gland(s).
  - a) The upper glands lie posterior to the mid portion of the thyroid gland, and the inferior glands lie at the lower border of the thyroid.
2. Image the parathyroid gland in both transverse and sagittal from the carotid arteries to the midline bilaterally and extending from the hyoid bone superiorly to the thoracic inlet inferiorly.
  - a) Look for enlarged lymph nodes around the carotid sheath (CCA, IJV, and deep cervical lymph node)
3. If enlarged parathyroid glands are detected (>5mm), measure in two dimensions
4. If a mass is detected, measure in orthogonal planes.
5. Color Doppler can distinguish prominent thyroid vessels from cystic masses and may be used to identify vascular abnormalities adjacent to the thyroid.

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**SPECIAL STATEMENT REGARDING PROTOCOL:** It is understood that other additional views, Doppler sampling sites, color settings, velocity ratios and measurements etc., will be used by the professional sonographer in evaluating any pathologic or suspected pathologic condition.

### EVALUATION AND DIAGNOSTIC CRITERIA

1. Real-time evaluation and documentation should include but not be limited to:

- a) Thyroid
  - i) Size and shape of gland (norm: 5cm x 2cm)
  - ii) Echogenicity
  - iii) Echo-texture
  - iv) Lesion (cystic or solid)
    - a) Margins
    - b) Shape
    - c) Size
    - d) Location
    - e) Lobulations (> or <3)
    - f) Finger-like extensions
    - g) Enhanced through transmission (posterior enhancement)
    - h) Posterior attenuation
  - v) Punctate calcifications
  - vi) Fluid collection
- b) Parathyroid
  - i) Size and shape of gland (norm: 5mm x 2mm)
  - ii) Echogenicity
  - iii) Echo-texture
  - iv) Lesion (cystic or solid)
    - a) Margins
    - b) Shape
    - c) Size
    - d) Location
    - e) Lobulations (>or<3)
    - f) Finger-like extensions
    - g) Enhanced through transmission (posterior enhancement)
    - h) Posterior attenuation
  - v) Fluid collection

Doppler/Color Doppler criteria should include but is not limited to:

- a) Evaluating the presence or absence of blood flow
  - i) Internal in mass
  - ii) External to mass
  - iii) Laminar flow patterns
  - iv) Normal vascularity
  - v) Turbulence and mosaics
- b) The vascularity of the thyroid/parathyroid gland.

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**SPECIAL STATEMENT REGARDING DIAGNOSTIC CRITERIA:** This document is not meant to supersede the qualified interpreting physician's prerogative to add or adjust the interpretation according to his/her best judgement.

### GUIDELINES FOR CALLING PRELIMINARY REPORTS:

1. Reporting preliminary or technical findings is both desirable and necessary in clinical practice.
2. The sonographer may/may not make the preliminary nature of the report known to the referring or interpreting physician.
3. The technical findings must be interpreted within the above stated pre-established diagnostic criteria guidelines.
4. When to call the referring or interpreting physician with a preliminary report:
  - a) Thyroid Ultrasound
    - i) Suspected Carcinomas
  - b) Parathyroid Ultrasound
    - i) Suspected Hyperplasia/Carcinoma

### REFERENCES:

1. ACR Standard for the Performance of Thyroid and Parathyroid Ultrasound Examination. 1994
2. AIUM Standards and Guidelines for the Accreditation of Ultrasound Practices
3. Ultrasound Procedure Protocol-The Jefferson Ultrasound Research and Education Institute. Second edition. June 1995
1. SDMS GUIDELINES FOR ABDOMEN REVIEW Revised 1994