

Ultrasound Protocol: Thyroid and Parathyroid

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Last Review Date: [Link to Last Review Date Table](#)

Link to: [General Imaging Requirements and Pathology Protocol PDF](#)

List of Required Images

Thyroid

- One transverse image dual screen or virtual convex at mid gland representative of overall appearance.

All images to be included on both right and left lobes

- **Transverse**
 - Superior
 - Mid, with and without measurements; width and height (AP)
 - Inferior
 - Single color CINE through gland
 - CINE transverse superior-inferior with complete visualization of the thyroid lobe.
- **Sagittal**
 - Lateral
 - Mid, with and without measurement length
 - Mid with color Doppler
 - Medial
 - CINE sagittal lateral-medial with complete visualization of the thyroid lobe.
- **Isthmus Transverse**
 - Mid, with and without measurement height (AP)
 - Mid with color Doppler
 - If isthmus is not fully seen on the above cines, provide CINE transverse superior-inferior with complete visualization of the isthmus.

Additional Images for Anatomy-Specific Pathology

Thyroid Nodule Documentation (ACR TI-RADS Chart is at the end of this section)

Initial Scan: Measure 4 most suspicious nodules in gland based on TI-RADS guidelines. All measurements in cm.

- **Guidelines for what to measure:**
 - **SOLID:**
 - Measure solid nodules that are 1.0 cm or more (in any dimension).
 - Measure solid nodules that are 0.5-1.0 cm, only if they have suspicious features, such as: hypoechoic (2-3 pts), calcifications (1-3 pts), taller than wide (3 pts), and/or irregular margins (2-3 pts). Otherwise, do not document.

- CYSTIC/PARTIALLY CYSTIC: Measure nodules that are 1.0 cm or more (in any dimension).
- Smaller nodules (solid < 0.5 cm; cystic/partially cystic < 1.0 cm) do **NOT** need to be measured or formally detailed on worksheet.
 - HOWEVER: Please note on worksheet "Additional small solid/cystic nodules present."
- **Nodule Numbering Order**
 - N1 through N4: must be annotated with nodule number and nodule location on images.
 - Right lobe superior to inferior → isthmus → left lobe superior to inferior (for example, if 3 nodules are in the right lobe (N1-N3), then a left nodule will be N4. If no right nodules or isthmus nodules, the first nodule on the left is N1).
- **Measure nodule size in 3 dimensions.**
 - True transverse plane: height (AP) and width dimensions. (Careful attention to height > width, which receives 3 points in TIRADS scoring.)
 - True sagittal plane: length (SI) dimension.
- **Worksheet Documentation:**
 - Number nodules. Nodule numbers on images should match numbers on worksheet.
 - Measurements always documented in this order: Length x Height x Width.
 - On the thyroid diagram, draw only a circle for the nodule with the nodule number beside/inside the circle. (N1)
 - Location
 - **Side:** Right, Isthmus, Left
 - **Which third:** Superior, Mid, Inferior
 - **Which area within the third:** Anterior, Posterior, Medial, Mid, Lateral, Anteromedial, Anterolateral, Posteromedial, Posterolateral
 - Features
 - **Composition:** Solid/Mostly Solid, Mixed Solid/Cystic, Spongiform, Cystic/Mostly cystic. Show comet-tail artifact for colloid.
 - **Margin:** Smooth, Ill-Defined, Irregular/Lobulated (jagged, spiculated, sharp angles), Obvious extension beyond thyroid.
 - **Echogenic Foci:** Absent or present. If possible, elaborate on microcalcifications vs. macrocalcifications.
 - Nodule features that do **not** need to be described on the worksheet.
 - **Echogenicity:** Radiologist will evaluate echogenicity in relation to the normal thyroid tissue and the strap muscles.
 - **Vascularity:**
 - Add more CINEs if gland size warrants to ensure that all nodules are visualized.
 - Dedicated color images of each nodule with color are not necessary, EXCEPT:
 - (1) If there is truly dramatic vascularity of a nodule in real-time: provide short color Doppler of the nodule, CINE if helpful.
 - (2) Cyst: provide single image with color box over anechoic cyst.
 - (3) Vessel: if appears like a hypoechoic nodule or cyst on a still image, provide image with color box to show it is a vessel.

Follow Up Scan:

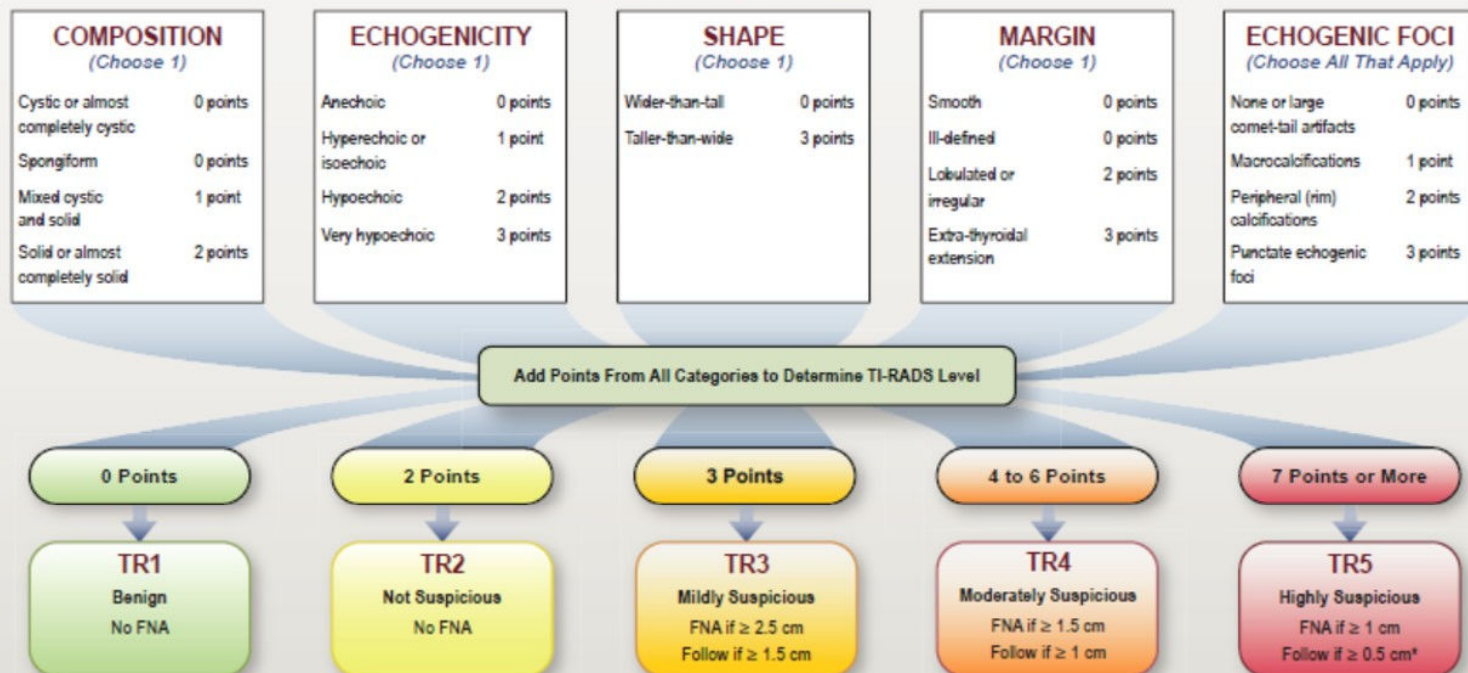
- Nodules that did not require follow-up per the prior study report do **NOT** need annotating on images or documenting on worksheet, if no new suspicious feature and/or no significant change in size.
- If numerous new suspicious nodules are seen, only a **maximum of 6 nodules** should be annotated with measurements and documented on worksheet. For example, if 4 nodules are being followed, only 2 new nodules can be added to the new report, for a total of 6, even if you see 5 new nodules. Select those with the most significant suspicious features such as; very hypoechoic, taller than wide, irregular/extrathyroidal margins, punctate echogenic foci/microcalcifications, or rapid size increase.
- For follow up of studies performed prior to 8/1/2026 that have more than 6 nodules designated to be followed, continue to follow all of the nodules requiring follow up.
- Nodule Numbering System:
 - **Keep the same numbering system as on the initial study.** N1 will always be N1 and N4 will always be N4 on follow up studies. Even if initial N2 and N3 are not being followed, you would not change N4 to a lower number.
 - **If Nodule #X did not require follow up and is stable, do not re-use that nodule number.**
 - **If Nodule #X is no longer seen, document this and do not re-use that nodule number.**
 - Give **NEW nodules** the next sequential numbers after all of the previously used nodule numbers. For example, N1-N4 were previously documented. N2 and N3 did not need following. The two new nodules will be labeled N5 and N6; they will not be labeled N2 and N3. Additionally, do NOT change initial N4 to N2 on the follow up study and then give the new nodules labels of N3 and N4. On the follow up study, N1, N4, N5, and N6 will be documented. N1 and N4 are the same nodules as on the prior. N5 and N6 are new nodules. Even if the new nodules are on the right side or isthmus and prior nodules are on the left, the new nodules are labeled with the next sequential number, not previously used on any prior study. This will ensure that N1 is always compared to N1; N3 is always compared to N3, etc.
- If measuring a **previously biopsied nodule**, please provide SIZE at time of biopsy or from the immediately preceding formal US study, DATE of biopsy, and PATHOLOGY results (if available).

Neck Compartments: Abnormal Lymph Node Documentation

Document **3** most abnormal lymph nodes on each side. When abnormal LNs present, evaluate the contralateral side. Accurately describe location of nodes on worksheet. Do not save measurements for or document normal lymph nodes.

- Transverse mid portion of each LN
- Sagittal mid portion of each LN
- **Measure in the following two dimensions:**
 - Maximum long axis
 - Shortest cross-sectional measurement perpendicular to the long axis
- **Examples of abnormal lymph nodes:**
 - Short axis = or > 1.0 cm (submandibular: 1.5 cm)
 - Thick, irregular, and/or nodular cortex
 - Hypervascular cortex
 - Effaced echogenic hilum or non-visualized vascular pedicle
 - Microcalcifications (regardless of size or other morphology)

ACR TI-RADS



COMPOSITION	ECHOGENICITY	SHAPE	MARGIN	ECHOGENIC FOCI
Spongiform: Composed predominantly (>50%) of small cystic spaces. Do not add further points for other categories. Mixed cystic and solid: Assign points for predominant solid component. Assign 2 points if composition cannot be determined because of calcification.	Anechoic: Applies to cystic or almost completely cystic nodules. Hyperechoic/isoechoic/hypoechoic: Compared to adjacent parenchyma. Very hypoechoic: More hypoechoic than strap muscles. Assign 1 point if echogenicity cannot be determined.	Taller-than-wide: Should be assessed on a transverse image with measurements parallel to sound beam for height and perpendicular to sound beam for width. This can usually be assessed by visual inspection.	Lobulated: Protrusions into adjacent tissue. Irregular: Jagged, spiculated, or sharp angles. Extrathyroidal extension: Obvious invasion = malignancy. Assign 0 points if margin cannot be determined.	Large comet-tail artifacts: V-shaped, >1 mm, in cystic components. Macrocalcifications: Cause acoustic shadowing. Peripheral: Complete or incomplete along margin. Punctate echogenic foci: May have small comet-tail artifacts.

*Refer to discussion of papillary microcarcinomas for 5-9 mm TR5 nodules.

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For Thyroidectomy and Parathyroid evaluation, continue to the next page...

Partial or Complete Thyroidectomy

- If available, provide date of surgery, side of malignancy/abnormality and pathology on the worksheet.
- All images to be included on both right and left thyroid beds unless partial thyroidectomy, then follow the above “Thyroid” protocol for the portion(s) still present.

Thyroidectomy Bed:

- **Transverse**
 - Minimum **3** representative still images superior-inferior
 - CINE superior-inferior through thyroid bed
 - CINE out laterally superior-inferior from submandibular gland/hyoid bone to clavicle
- **Sagittal**
 - Minimum **3** representative still images lateral-medial
 - CINE lateral-medial through thyroidectomy bed
- **Transverse**
 - Midline neck isthmus bed

Any mass or cysts should be measured and documented per the Pathology Protocol

- **Neck Compartments**

Document **3** most abnormal lymph nodes on each side. In presence of abnormal nodes, contralateral side should be evaluated also. ***see Abnormal Lymph Node Documentation section above**

Parathyroid

- Perform only if the study indication is to evaluate the parathyroid gland or hyperparathyroidism.
- Note: Usually the 4 parathyroid glands will be abutting the inferior and posterior aspect of the thyroid gland and will be hypo to iso-echoic with a feeding vessel.
- Representative still and CINE images in sagittal and transverse:
 - From carotid artery bifurcation superiorly to thoracic inlet inferiorly: scan through carotid arteries to midline bilaterally.
 - As parathyroid glands may be hidden below the clavicles in the lower neck and upper mediastinum, it may be helpful to have the patient swallow during the examination with constant real-time observation.
 - Upper mediastinum may be imaged with an appropriate probe by angling under the sternum from the sternal notch.