

## Thyroid and Parathyroid Ultrasound Protocol

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**Last Reviewed:** July 2018

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**\*\*NOTE for all examinations:**

1. If documenting possible flow in a structure/mass, all color/Doppler should be accompanied by a spectral gate for waveform tracing  
**\*\*EXCEPTION: Thyroid nodules; spectral tracing does not need to be provided**
2. CINE clips to be labeled:
  - MIDLINE structures: “right to left” when longitudinal and “superior to inferior” when transverse
  - RIGHT/LEFT structures: “lateral to medial” when longitudinal and “superior to inferior” when transverse
  - \*\*each should be 1 sweep, NOT back and forth\*\***

### Thyroid

#### General

-Longitudinal: lateral, mid, medial both lobes

-Transverse: inferior, mid, superior both lobes and isthmus

#### WHEN & WHAT to CINE:

-If completely normal gland: no CINE is required

-If any part of gland is abnormal:

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1. Both lobes (even if only 1 is abnormal): Transverse CINE from submandibular gland/hyoid bone to sternal notch through each lobe SEPARATELY
  - If possible, include portion of isthmus on each side
  - If not possible, separate transverse CINE through isthmus
2. ONLY abnormal lobe (s): Longitudinal CINE

## **Size and Volume:**

- Measure size of each lobe and provide volume; provide prior volume if relevant prior is available (if no volume on prior, provide prior measurements)
- Measure thickness (AP) of isthmus on transverse view

## **Vascularity:**

- Representative color Doppler images in longitudinal of each lobe and transverse of isthmus

## **Nodules:**

*For reference, ACR TI-RADS Summary Table is attached at the end of this document. This is used by radiologists to describe and categorize nodules and highlights important features to document in nodule imaging.*

*\*\*If measuring a nodule that has been previously biopsied, please provide SIZE (at time of biopsy or immediately preceding formal study), DATE of biopsy and PATHOLOGY results (if available)\*\**

## **For organization:**

- Nodules should be labeled, measured and described in the following order to maintain consistency between examinations:
  - 1. Right lobe: superior to inferior
  - 2. Isthmus: right to left
  - 3. Left lobe: superior to inferior

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-**Label** each nodule on the images to match labels and description on worksheet: Nodule 1 on the images should be same as nodule 1 on the worksheet, Nodule 2 on the images should be same as nodule 2 on the worksheet, etc.

--> Note, in a multinodular gland with nodules in the right, isthmus and left, this may mean that the 1<sup>st</sup> nodule measured on the left is called "Nodule #4". *Do not start numbers over from #1.*

→ Attempt to re-label nodules the same as prior examinations, i.e.:

-Nodule #4 on examination from 2015 should be labeled Nodule #4 on examination from today

-If Nodule #4 is no longer well seen, document this and continue numbering as per prior examination/worksheet

Document on worksheet: *Location, Size, Basic features (composition, calcifications, margin)*

## 1. **Location:**

→ Which side: Right or left lobe

→ Which third: Inferior pole, interpolar, or superior pole

- Which area within this third: Anterior, posterior, medial, lateral, anteromedial, anterolateral, posteromedial, posterolateral

2. **Size** in 3 dimensions: measure in horizontal and vertical (rather than oblique) for consistency across exams

NOTE: Make AP measurement for nodule in the transverse plane on the same image where you measure transverse dimension

3. **DESCRIBE** basic features: composition, calcifications, and margin (in Sonoreview: Select features on worksheet):

1. Composition: solid, cystic/partially cystic or spongiform

-If possible show comet-tail artifact for colloid

2. Echogenic Foci/Calcification: absent or present

-If possible, elaborate as to macrocalcification versus microcalcification

3. Margin: smooth or suspicious

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-Suspicious = jagged, irregular, portion of nodule extends beyond thyroid, etc.

NOTE: For worksheets, please draw only an oval/circle for the nodule. It is not necessary to detail internal architecture on the diagrams. The legend has been removed for clarity.

**Provide adequate images that document nodule vascularity & echogenicity:** *Do not need to be described on worksheet by technologist. Radiologist will assess at time of imaging review.*

**-Vascularity:** Evaluate vascularity of each nodule in real-time.

-Provide: Single color CINE (transverse) through gland.

-->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:

**NOTE EXCEPTIONS:**

(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

**-Echogenicity:** Provide images that clearly show nodule in relationship to remainder of thyroid and strap muscles

-Technologist does not have to denote echogenicity on worksheet but it *is important to tailor images to help radiologist document accurate echogenicity* (CINEs can help here)

→ For reference:

- Radiologists evaluate echogenicity as it relates to the thyroid gland and the strap muscles. Definitions used by radiologists (per TIRADS document, see table at end of protocol for reference)

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- Echogenicity = hyper – iso – hypo - VERY hypo
  - Hyperechoic is > thyroid
  - Iso is = thyroid
  - Hypoechoic is < than thyroid but = or > strap muscle
  - VERY hypoechoic is < strap muscle

## **Guidelines for what to measure:**

-Size:

→ SOLID: Measure nodules that are 5 mm or more (in any dimension)

→ CYSTIC/PARTIALLY CYSTIC: Measure nodules that are 1 cm or more (in any direction)

\*\* Smaller nodules (solid < 5mm; cystic/partially cystic < 1cm) do **not** need to be measured or formally recorded on worksheet

- HOWEVER: Please note their presence and general description

→ For example: “multiple small additional solid/cystic nodules bilaterally”

-Multinodular gland: Measure the 3 most suspicious nodules per side and 2 most suspicious in the isthmus

## **Neck Compartments:**

-Evaluate for abnormalities

-Document enlarged lymph nodes: location and size (3 dimensions), comment on presence of calcification

→ Measure 3 largest on each side, if enlarged or abnormal

→ Provide specific images of the central hilum including color Doppler in abnormal lymph nodes

-Accurately mark location of nodes on worksheet

## **Examples of abnormal nodes:**

-Thick, irregular, and/or nodular cortex

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- Hypervascular cortex
  - Effaced echogenic hilum or non-visualized vascular pedicle
  - Microcalcifications (regardless of size or other morphology)
  - Short axis = or > 10 mm (submandibular: 15 mm), regardless of morphology
  - Anything else deemed worrisome by technologist*
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## **Partial or Complete Thyroidectomy**

-If available, provide date of surgery, side of malignancy/abnormality and pathology (from Epic, clinic order, etc.)

*\*\*If partial, follow protocol above for "Thyroid" for the side still present\*\**

-Thyroid bed in longitudinal and transverse:

→ Transverse CINE through thyroid bed

→ Transverse CINE out laterally from submandibular gland/hyoid bone to sternal notch

→ Longitudinal CINE through thyroidectomy bed

→ Provide representative images: at least 3 in transverse and 3 in longitudinal

-Any mass or cysts should be measured and documented

## **Neck Compartments:**

-Evaluate for abnormalities

-Document enlarged lymph nodes: location and size (3 dimensions), comment on presence of calcification

→ Measure 3 largest on each side, if enlarged or abnormal (see above)

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→Provide specific images of the central hilum including color Doppler in abnormal lymph nodes

-Accurately mark location of nodes on worksheet

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## **PARATHYROID**

Note: Majority of parathyroid will be next to the thyroid gland, immediately posterior or inferior to the thyroid gland

→Generally hypoechoic to normal thyroid gland with feeding vessel

Representative still and CINE images in longitudinal and transverse images:

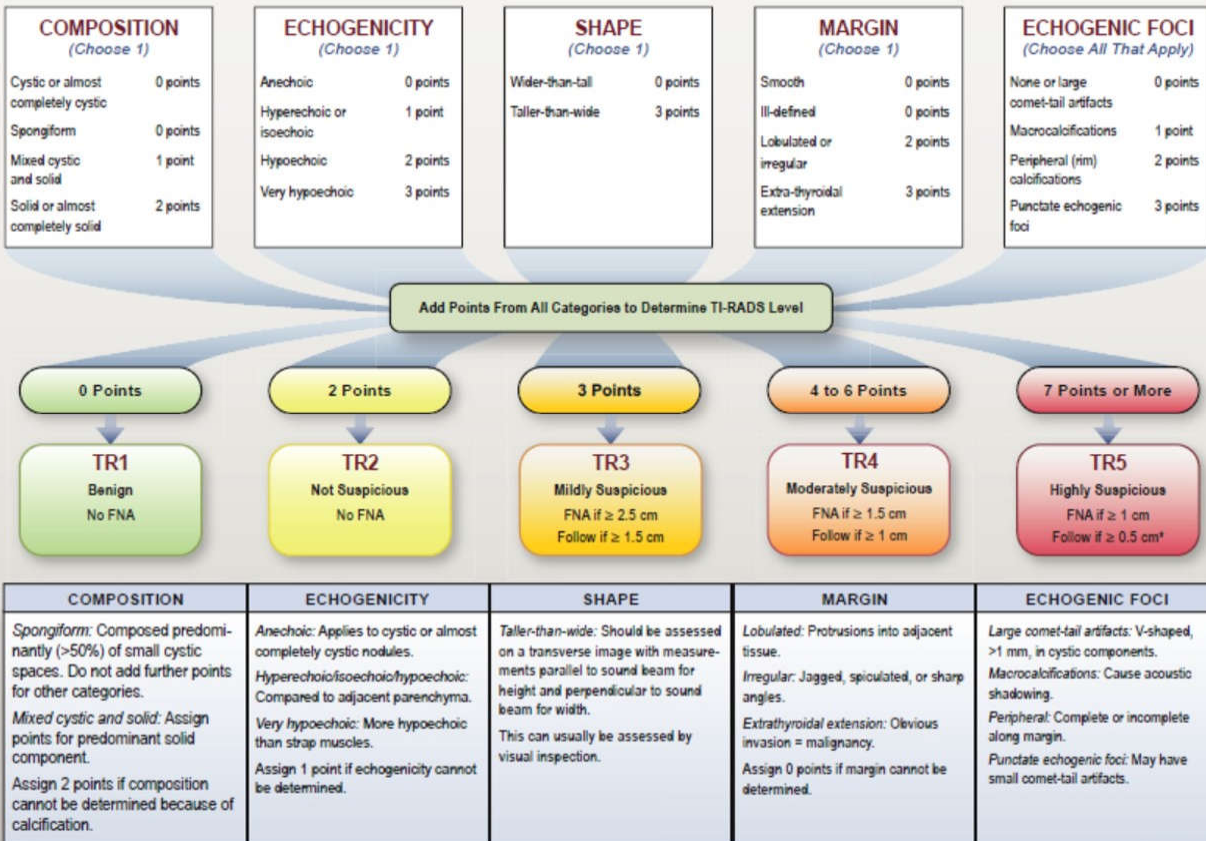
-From carotid artery bifurcation superiorly to thoracic inlet inferiorly: scan through carotid arteries to midline bilaterally

*\*\*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.*

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## ACR TI-RADS



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

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