

# TI-RADS

- One score is assigned from each of the following categories:
- **Composition:** (choose one)
  - cystic or completely cystic \*: 0 points
  - spongiform \*: 0 points
  - mixed cystic and solid: 1 point
  - solid or almost completely solid: 2 points
- **Echogenicity:** (choose one)
  - anechoic: 0 points
  - hyper- or isoechoic: 1 point
  - hypoechoic: 2 points
  - very hypoechoic: 3 points
- **Shape:** (choose one) (assessed on the transverse plane)
  - wider than tall: 0 points
  - taller than wide: 3 points
- **Margin:** (choose one)
  - smooth: 0 points
  - ill-defined: 0 points
  - lobulated/irregular: 2 points
  - extra-thyroidal extension: 3 points
- Any and all findings in the final category are also added to the other four scores.
- **Echogenic foci:** (choose one or more)
  - none: 0 points
  - large comet tail artifact: 0 points
  - macrocalcifications: 1 point
  - peripheral/rim calcifications: 2 points
  - punctate echogenic foci: 3 points

# TI-RADS

- If multiple nodules are present only the four highest scoring nodules (not necessarily the largest) should be scored, reported, and followed up.
- \* Predominantly cystic or spongiform nodules are inherently benign. If these features are present no further points will be added (automatically TR1)

# Scoring and classification

- **TR1:** 0 points
  - benign
- **TR2:** 2 points
  - not suspicious
- **TR3:** 3 points
  - mildly suspicious
- **TR4:** 4-6 points
  - moderately suspicious
- **TR5:**  $\geq 7$  points
  - highly suspicious

# Recommendations

- **TR1:** no FNA required
- **TR2:** no FNA required
- **TR3:**  $\geq 1.5$  cm follow up,  $\geq 2.5$  cm FNA
  - follow up: 1, 3 and 5 years
- **TR4:**  $\geq 1.0$  cm follow up,  $\geq 1.5$  cm FNA
  - follow up: 1, 2, 3 and 5 years
- **TR5:**  $\geq 0.5$  cm follow up,  $\geq 1.0$  cm FNA
  - annual follow up for up to 5 years

# Recommendations

- Biopsy is recommended for suspicious lesions (TR3 - TR5) with the above size criteria.
- If there are multiple nodules, the two with the highest ACR TI-RADS grades should be sampled (rather than the two largest).
- Interval enlargement on follow up is felt to be significant if there is a increase of 20% and 2 mm in two dimensions, or a 50% increase in volume.
- If the ACR TI-RADS level increases between scans, an interval scan the following year is again recommended.

# Risk of malignancy

- TR1: 0.3%
- TR2: 1.5%
- TR3: 4.8%
- TR4: 9.1%
- TR5: 35%

# Practical points

- "Punctate echogenic foci" can encompass both microcalcifications and inspissated colloid, depending on technique and size of the colloid foci in a nodule.
- Unlike microcalcifications, foci of inspissated colloid are not associated with malignancy and they often appear differently to microcalcifications on closer inspection. Inspissated colloid is not a high risk feature.