

Table 1

Features of sonographic examination report

Thyroid Gland Features	Nodule Features	Lymph Node Features
Size of each lobe	Size	Size
Echogenicity	Location	Shape
Texture (smooth/heterogeneous)	Echogenicity	Calcifications/cystic change
Vascularity	Composition	Location
Tracheal deviation	Echogenic foci	Vascular pattern
Isthmus thickness	Margins	Echogenicity
	Vascular pattern	

Sonographic Pattern	US features	Estimated risk of malignancy	Consider biopsyFNA size cutoff (largest dimension)
High suspicion	Solid hypoechoic nodule or solid hypoechoic component of a partially cystic nodule with one or more of the following features: irregular margins (infiltrative, microlobulated), microcalcifications, taller than wide shape, rim calcifications with small extrusive soft tissue component, evidence of extrathyroidal extension	>70-90%*	Recommend FNA at > 1 cm
Intermediate suspicion	Hypoechoic solid nodule with smooth margins without microcalcifications, extrathyroidal extension, or taller than wide shape	10-20%	Recommend FNA at > 1 cm

Sonographic Pattern	US features	Estimated risk of malignancy	Consider biopsyFNA size cutoff (largest dimension)
Low suspicion	Isoechoic or hyperechoic solid nodule, or partially cystic nodule with eccentric solid areas, without microcalcification, irregular margin or extrathyroidal extension, or taller than wide shape.	5-10%	Recommend FNA at > 1.5 cm
Very low suspicion	Spongiform or partially cystic nodules without any of the sonographic features described in low, intermediate or high suspicion patterns	< 3%	Consider FNA at > 2 cm Observation without FNA is also a reasonable option
Benign	Purely cystic nodules (no solid component)	< 1%	No biopsy**



Categorization	Description	FNA Size Threshold	Surveillance Interval if Benign Cytology
ATA			
Benign	Anechoic cyst	Not recommended	Not recommended
Very Low	Complex; spongiform	≥ 2 cm	≥ 24 mo or clinical surveillance
Low	Complex or solid hyper/isoechoic	≥ 1.5 cm	12–24 mo
Intermediate	Solid hypoechoic	≥ 1 cm	12–24 mo
High	Hypoechoic with suspicious feature	≥ 1 cm	Repeat FNA and US within 12 mo

Table 2
ACR-TIRADS nodule features and associated points for each characteristic

Composition		Echogenicity		Shape		Margin		Echogenic Foci	
Cystic	0	Anechoic	0	Wider than tall	0	Smooth	0	None	0
Spongiform	0	Hyper/isoechoic	1	Taller than wide	3	Ill-defined	0	Comet-tails	0
Mixed	1	Hypoechoic	2			Lobulated/irregular	2	Macrocalcifications	1
Solid	2	Markedly hypoechoic	3			Extrathyroidal extension	3	Peripheral/rim	2
								Punctate	3

Adapted from Tessler FN, Middleton WD, Grant EG, et al. ACR thyroid imaging, reporting and data system (TI-RADS): white paper of the ACR TI-RADS Committee. J Am Coll Radiol 2017; 14(5):589; with permission.

Table 3
ACR-TIRADS scores

Score	0	2	3	4–6	7
TIRADS class	TR1	TR2	TR3	TR4	TR5
Clinical description	Benign	Not Suspicious	Mildly Suspicious	Moderately Suspicious	Highly Suspicious

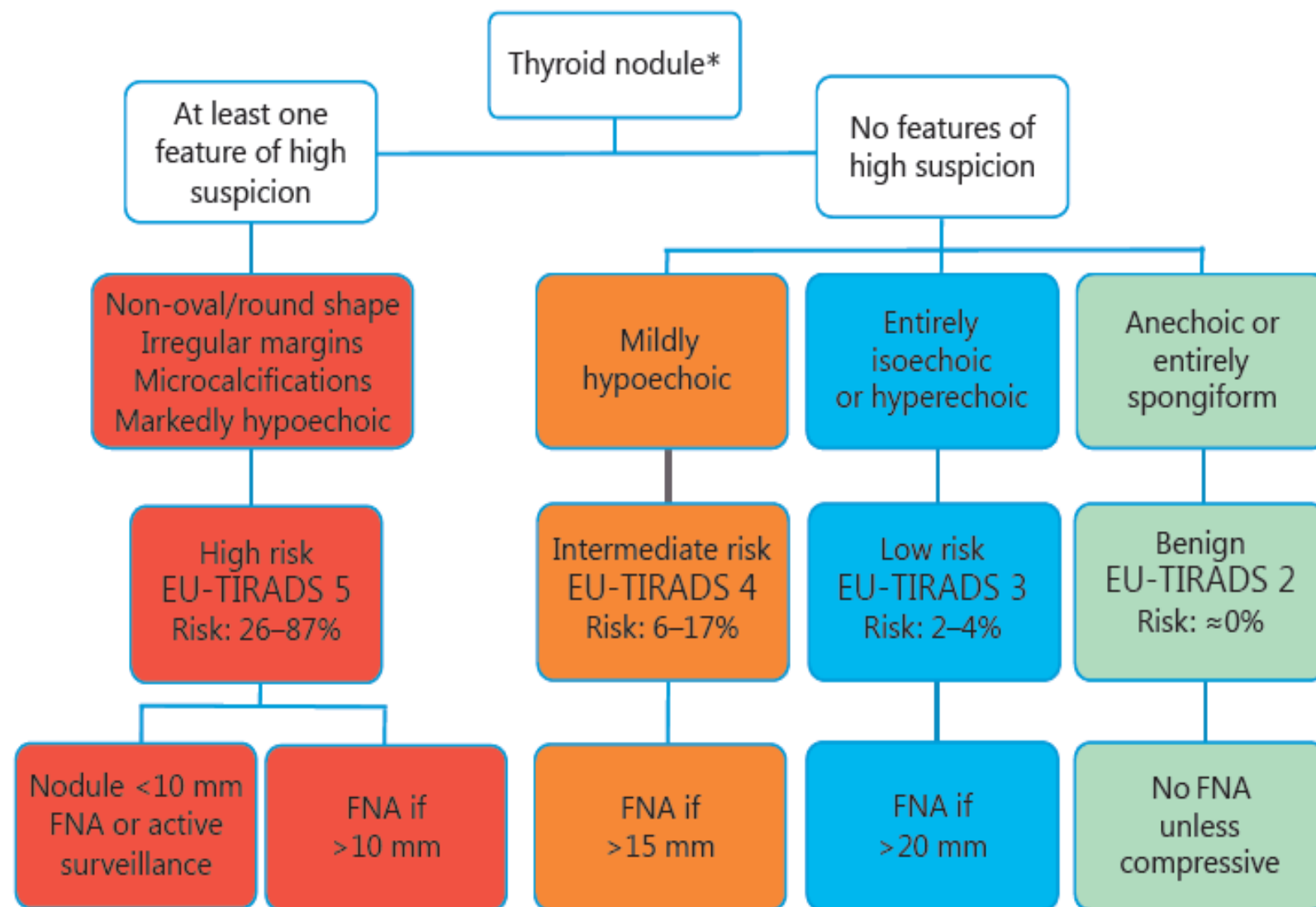
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Categorization	Description	FNA Size Threshold	Surveillance Interval if Benign Cytology
ACR-TIRADS			
0 Benign	0 points	Not recommended	
2 Not Suspicious	2 points	Not recommended	
3 Mildly Suspicious	3 points	FNA ≥ 2.5 cm Follow ≥ 1.5 cm	At 1, 3, and 5 y
4 Moderately Suspicious	4–6 points	FNA ≥ 1.5 cm Follow ≥ 1.0 cm	At 1, 2, 3, and 5 y
5 Highly suspicious	≥ 7 points	FNA ≥ 1.0 cm Follow ≥ 0.5 cm	Annually for 5 y

Table 2. EU-TIRADS categories and risk of malignancy

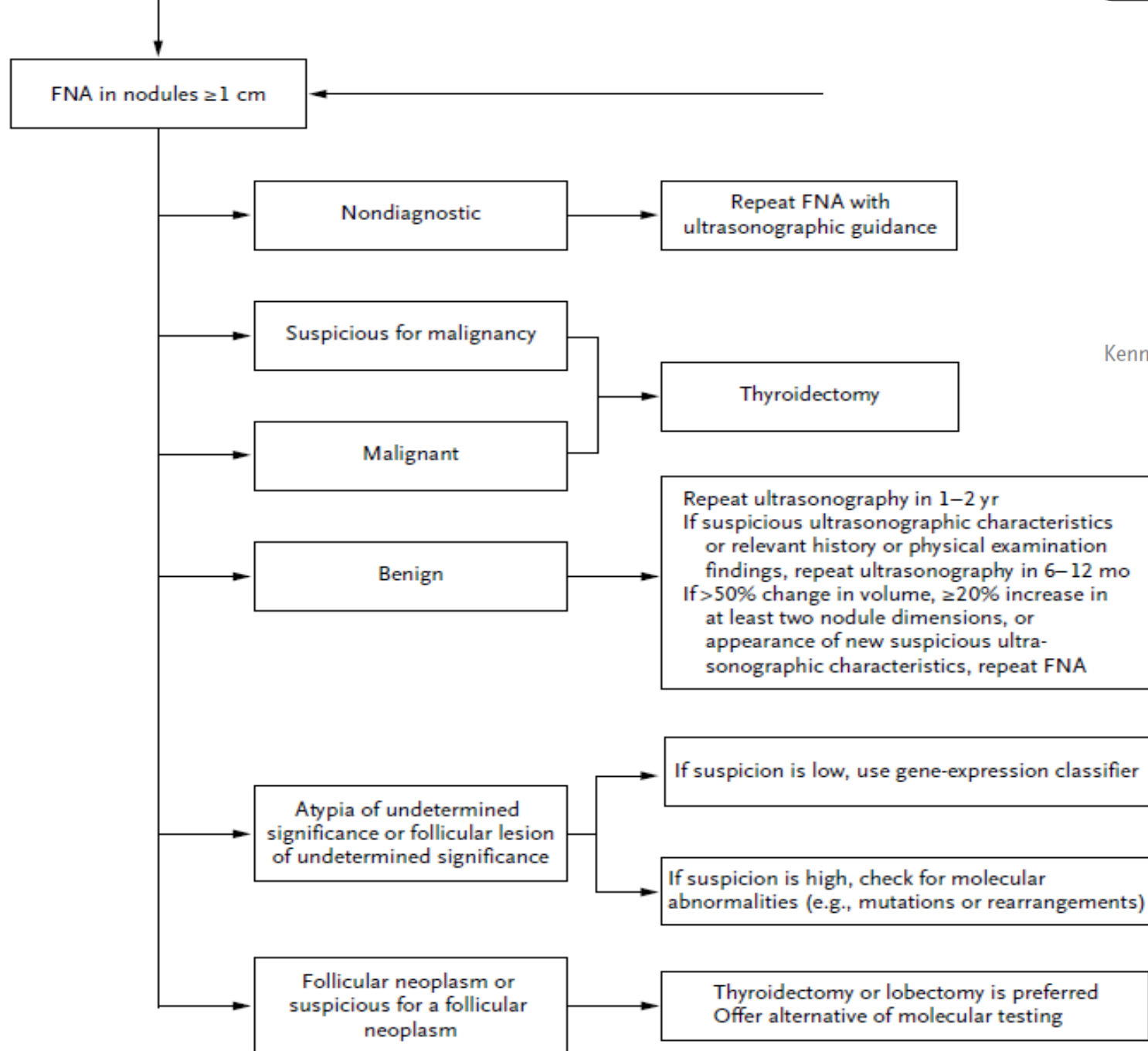
Category	US features	Malignancy risk, %
EU-TIRADS 1: normal	No nodules	None
EU-TIRADS 2: benign	Pure cyst Entirely spongiform	$\cong 0$
EU-TIRADS 3: low risk	Ovoid, smooth isoechoic/hyperechoic No features of high suspicion	2–4
EU-TIRADS 4: intermediate risk	Ovoid, smooth, mildly hypoechoic No features of high suspicion	6–17
EU-TIRADS 5: high risk	At least 1 of the following features of high suspicion: – Irregular shape – Irregular margins – Microcalcifications – Marked hypoechogenicity (and solid)	26–87
EU-TIRADS, European Thyroid Imaging Reporting and Data System; US, ultrasound.		



Bethesda System for cytologic diagnosis of thyroid nodules

Category	Category Name	Cytologic Features	Malignancy Risk (%)
I	Nondiagnostic or Unsatisfactory (ND)	Insufficient cellularity, obscuring blood	5–10
II	Benign	Normal-appearing follicular cells arranged in sheets or macrofollicles, abundant colloid	0–3
III	Atypical of Undetermined Significance or Follicular Lesion of Undetermined Significance (AUS/FLUS)	Sparsely cellular, microfollicles, mild nuclear changes	10–30
IV	Follicular Lesion/Suspicious for Follicular Lesion (FN/SFN)	Hypercellular, crowding, microfollicles, scant colloid	25–40
V	Suspicious for Malignancy (SFM)	Some features that suggest but not definitive for malignancy	50–75
VI	Malignant	Papillary architecture, definitive nuclear changes	97–99

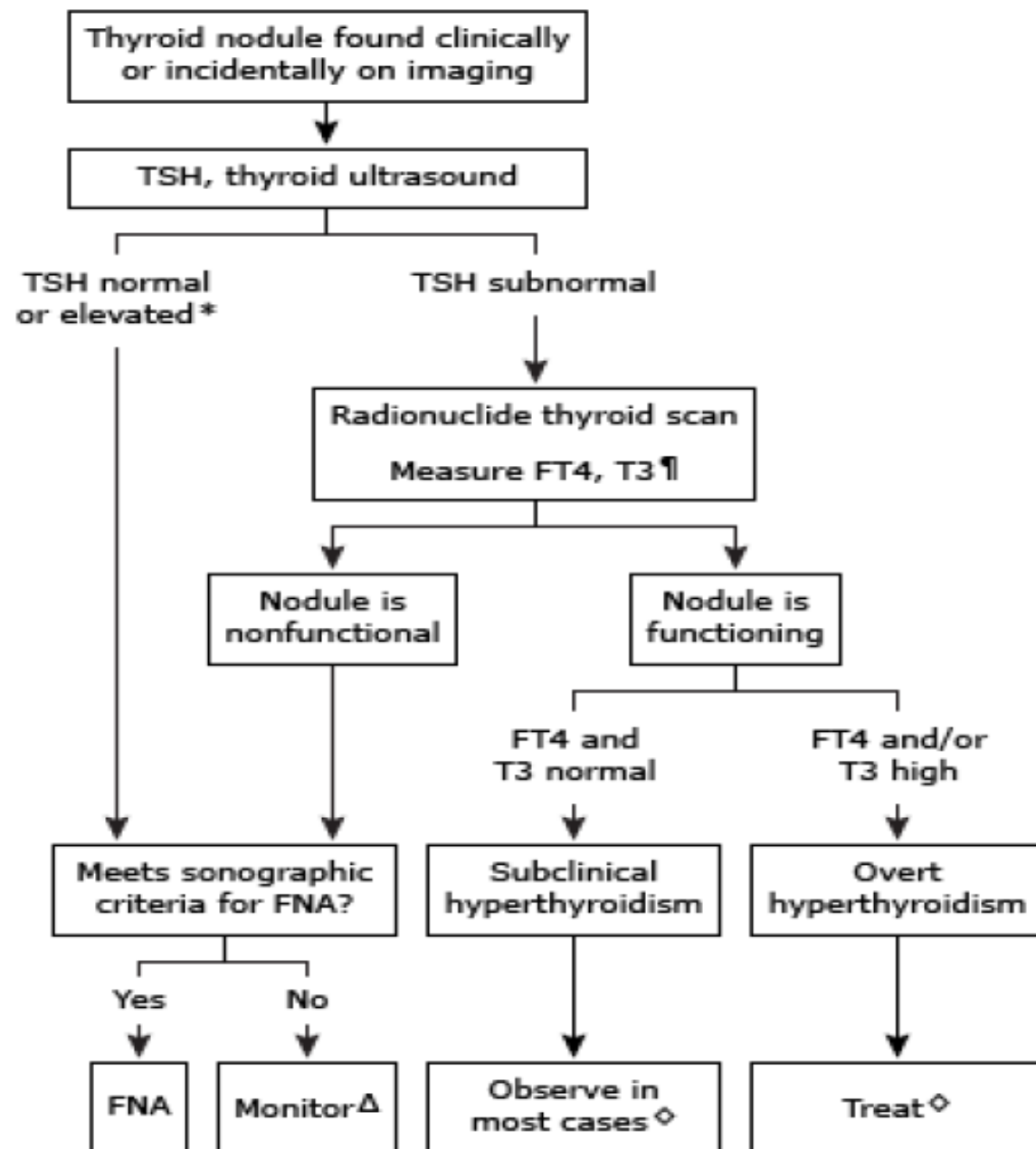
Data from Cibas ES, Ali SZ. The 2017 Bethesda System for Reporting Thyroid Cytopathology. *Thyroid* 2017;27(11):1341–6.

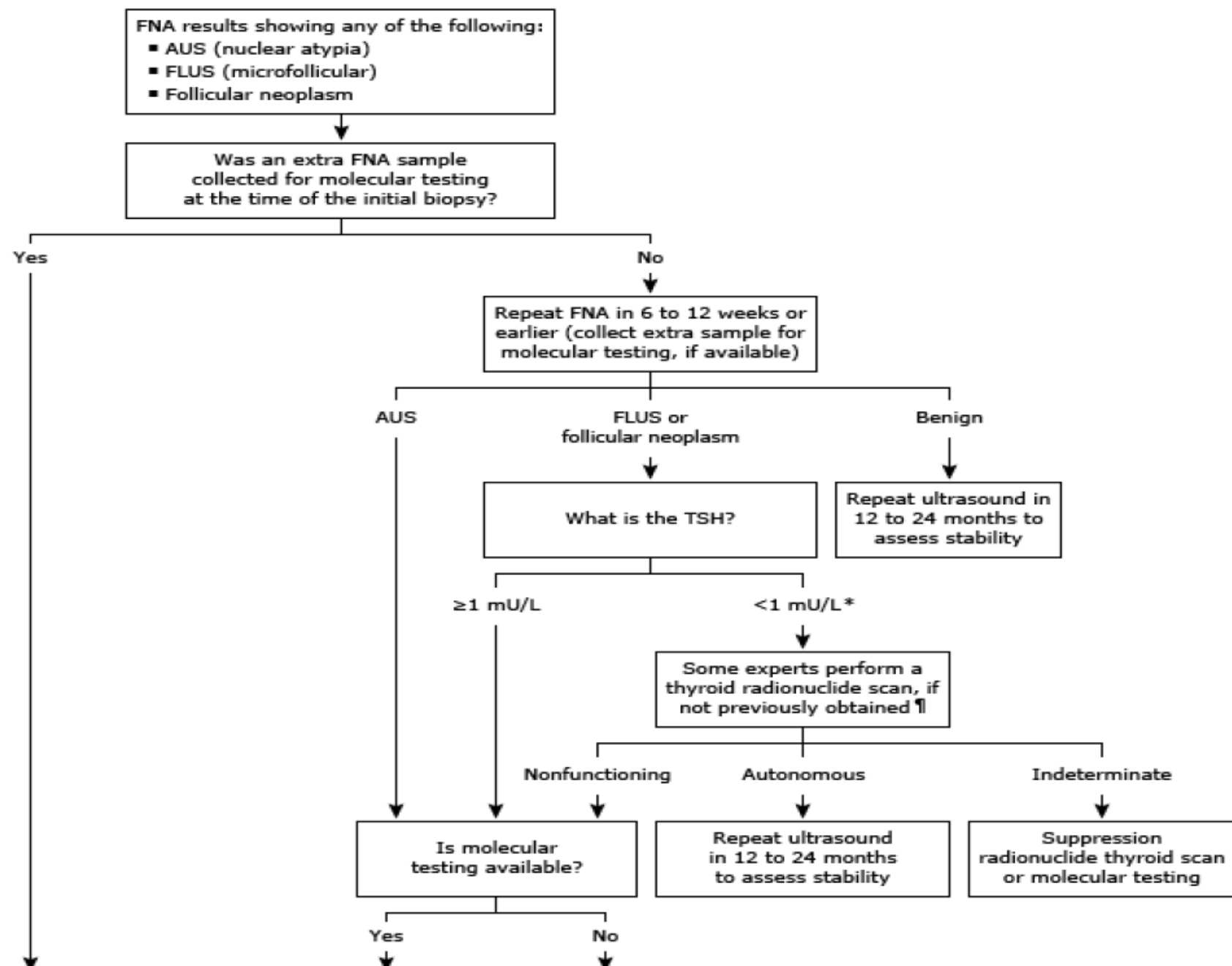


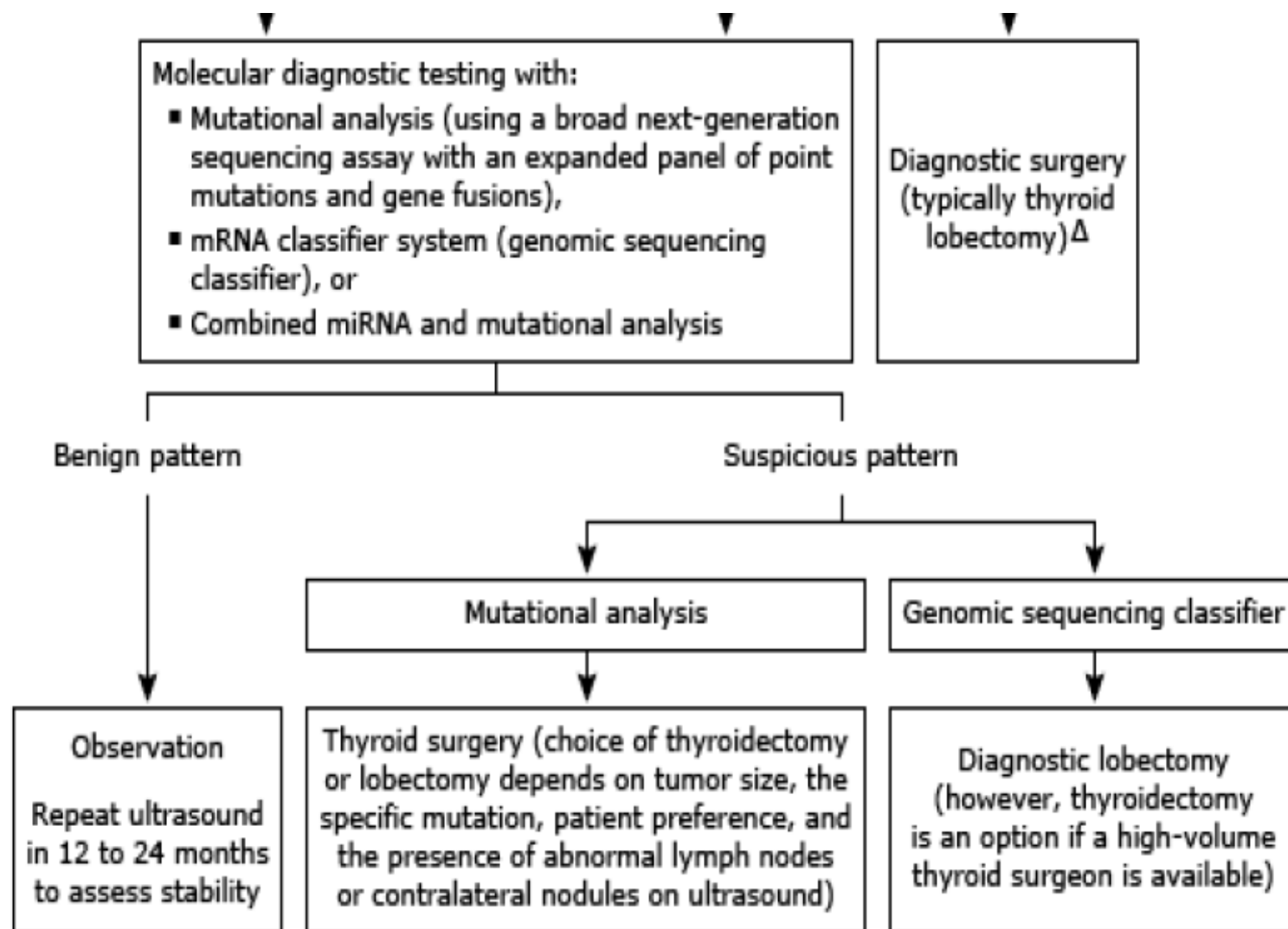
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Thyroid Nodules

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Cytopathologic diagnosis of follicular thyroid lesions

Cytologic pattern	Description	Histopathology
Benign macrofollicular fragments	Abundant colloid Predominantly large follicles and flat sheets of follicular cells	Nodular goiter (colloid adenoma) Macrofollicular adenoma
Follicular lesion or atypia of undetermined significance	Mixed macrofollicular and microfollicular nodules OR Cells with mild nuclear atypia OR Extensive oncocytic (Hürthle cell) change	Multinodular goiter Follicular adenoma Follicular cancer Papillary cancer (follicular variant) Hashimoto's thyroiditis
Follicular neoplasm (microfollicular)	Scant colloid Small microfollicles OR Clusters and clumps of cells with varying pleomorphism	Microfollicular adenoma OR Follicular carcinoma
	Cells have intranuclear inclusions and clefts	Follicular variant of papillary carcinoma