

INTRODUCTION

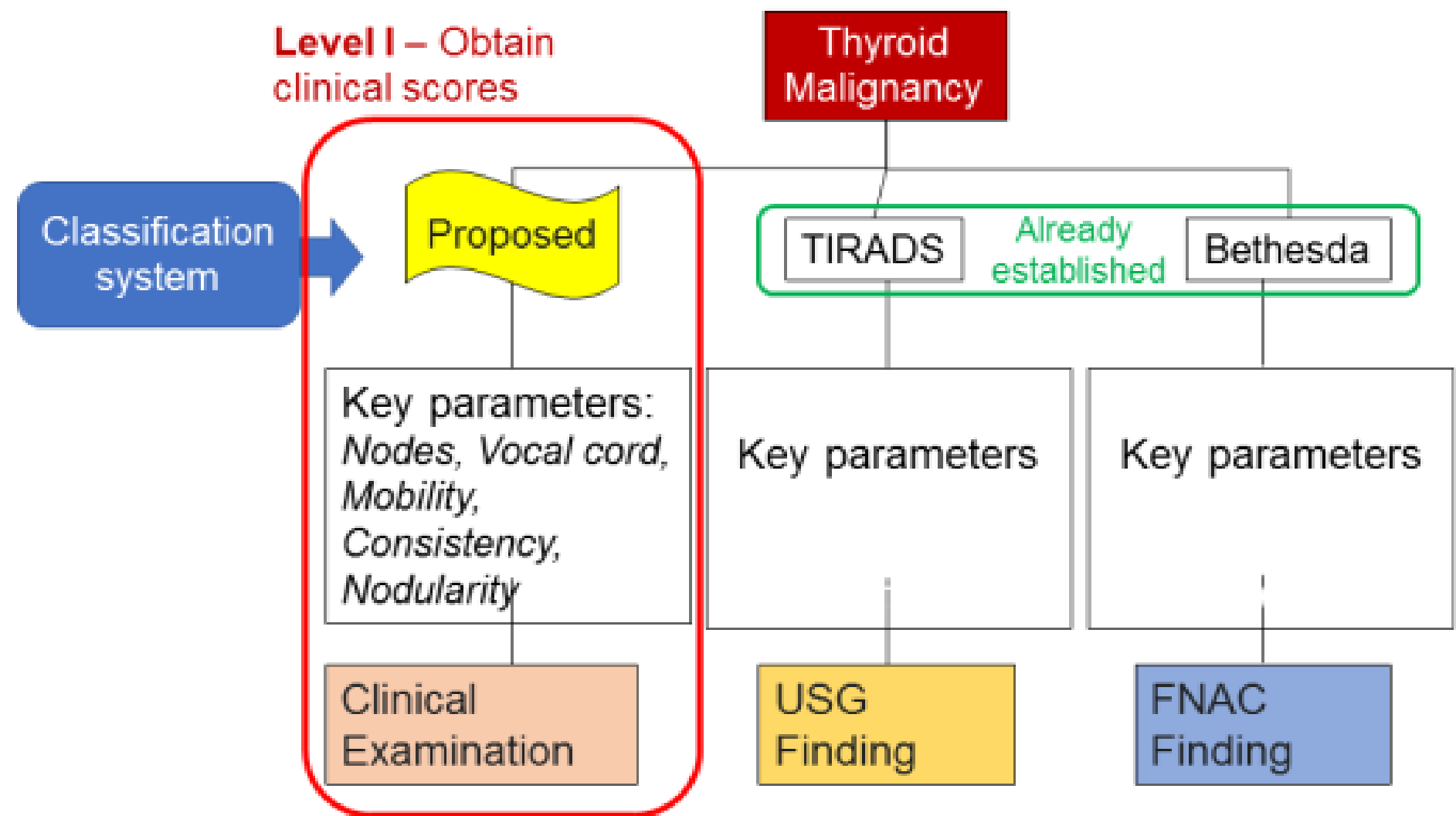
- Whether biological or on account of overzealous diagnostics, rising incidence of thyroid cancers is undisputed
- Guidelines across the globe with diverse recommendations
- Management decisions for extremes of pectrum reasonably clear
- Indeterminate nodules treatment issues remain unresolved
- No level I evidence practicable
- Genetic panels not standard of care, also cost and availability issues for resource constrained countries

AIMS AND OBJECTIVES

- To determine correlation of **Clinical examination, USG** and **FNAC** in predicting malignant potential in thyroid disease
- To devise an **Intergrated Pre-treatment Diagnostic Scoring System**

STUDY DESIGN AND METHODOLOGY

Prospective Observational Study



Preliminary results of the ‘IMPACCT’ study

Imaging, Pathological & Clinical Correlation in Thyroid

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LEVEL I - CLINICAL SCORING

Normalized weights for five clinical features:	
Nodes:	0.350
Nodularity:	0.072
Mobility:	0.070
Consistency:	0.045
Vocal cord:	0.463

For individual patient,
Clinical Score determined by addition of above weightages depending upon the presence of these parameters

RESULTS

- N= 429 subjects
- 22.9% had indeterminate results on USG (TIRADS IVA) and FNAC (Bethesda III, IV)
- 17.41% revealed malignancy on final histopathology

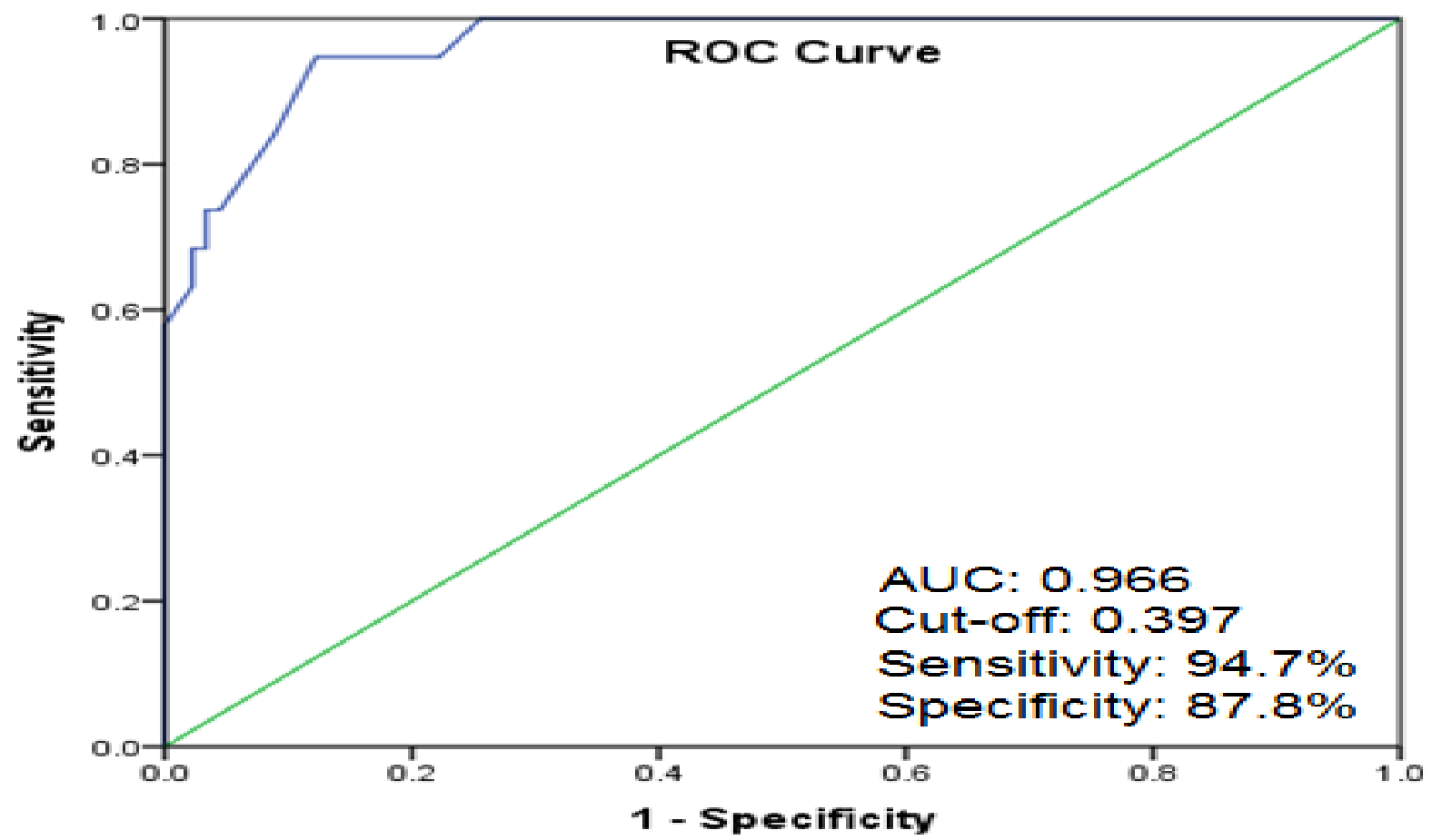
Diagnostic Test	Sensitivity	Specificity
Clinical Examination	56.65%	82.22%
USG	90.87%	82.78%
FNAC	89.74%	78.44%
Integrated Score	94.72%	87.89%

LEVEL II - INTEGRATED SCORING

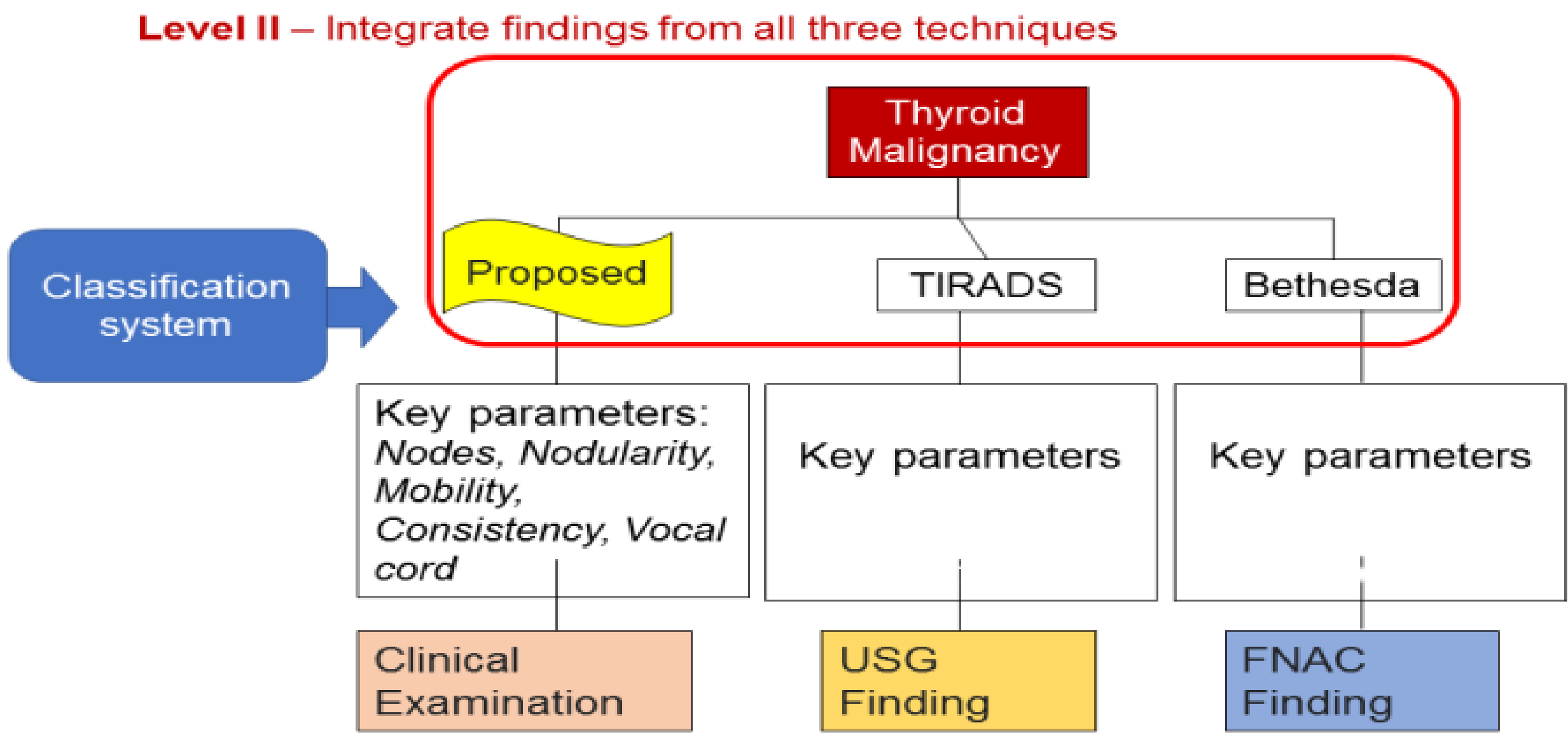
Obtain **Integrated score** for each patient

Integrated Score	Benign	Malignant	LR
<0.4	236	2	0.002
0.4-0.5	69	6	2.368
0.5-0.6	37	18	9.474
>0.6	12	49	28.421

The sensitivity and specificity of **integrated score** was better than the individual techniques, making it an improved diagnostic tool.



PREDICTING MALIGNANCY RISK BY INTEGRATED SCORING SYSTEM



LEVEL II - INTEGRATED SCORING

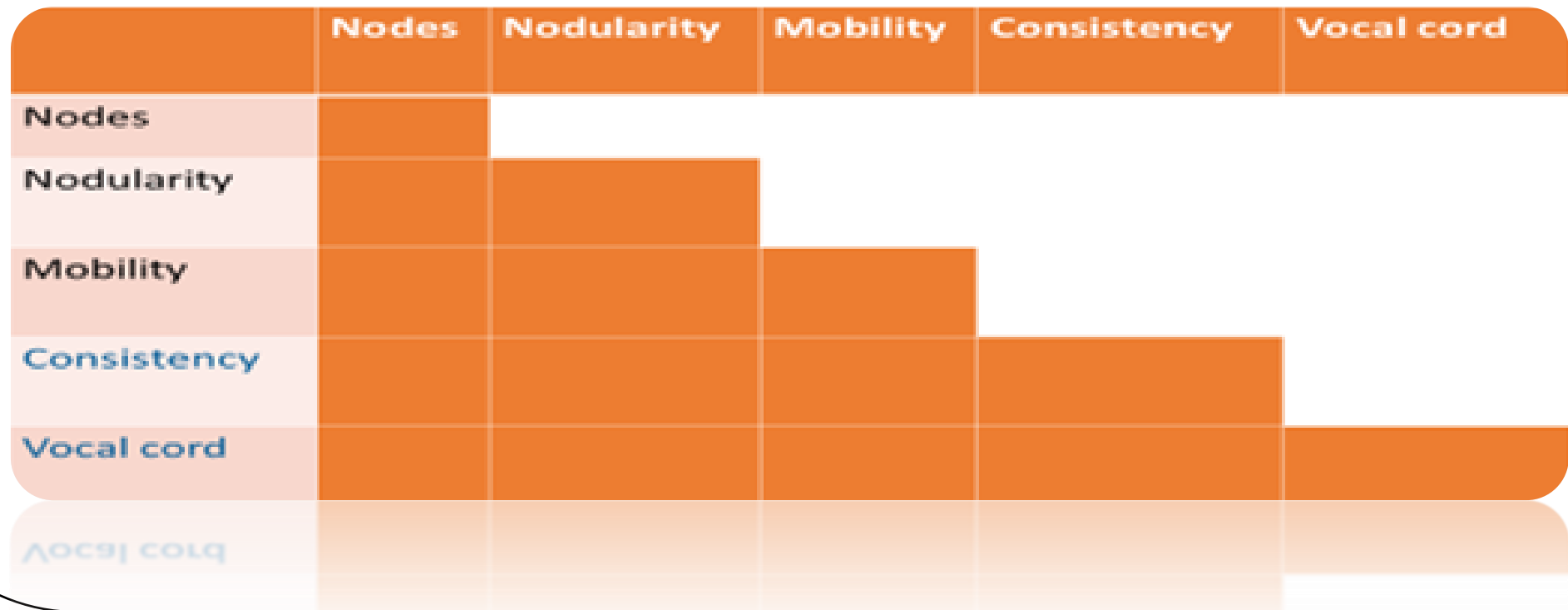
Techniques	Clinical	USG	FNAC
Kappa coefficient	0.199	0.355	0.364
Normalized weights	0.217	0.387	0.397

Obtain Cohen’s Kappa co-efficients for Clinical, USG and FNAC techniques by comparing with Histopathology
For an individual patient,
Cs × 0.217+ Us × 0.387 + Fs × 0.397 = Integrated Score

INTEGRATED SCORING SYSTEM

CLINICAL SCORE

Relative importance of key predictive clinical parameters using Saaty’s Eigen value method of weightages through expert judgments.

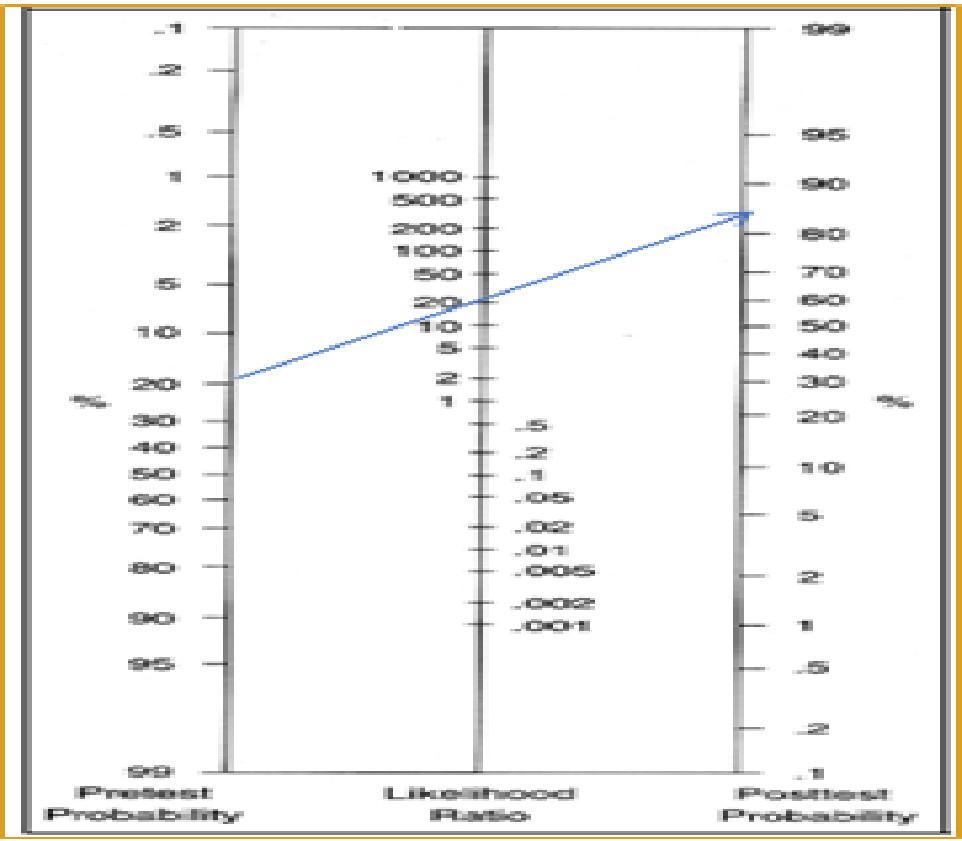


PREDICTIVE NOMOGRAMS

- Pre-test **probability** of malignancy was obtained considering prevalence of disease in community)
- Likelihood ratio** was decided based on integrated score for patient
- Post-test probability** of malignancy was determined by referring to nomogram

Ms. MA, 52/F
Pre-test probability estimate was 0.2 (hospital based prevalence estimate)

Clinical score: 0.115
USG: TIRADS IVB
FNAC Bethesda IV
Integrated score: 0.610
Corresponding LR: **28.421**

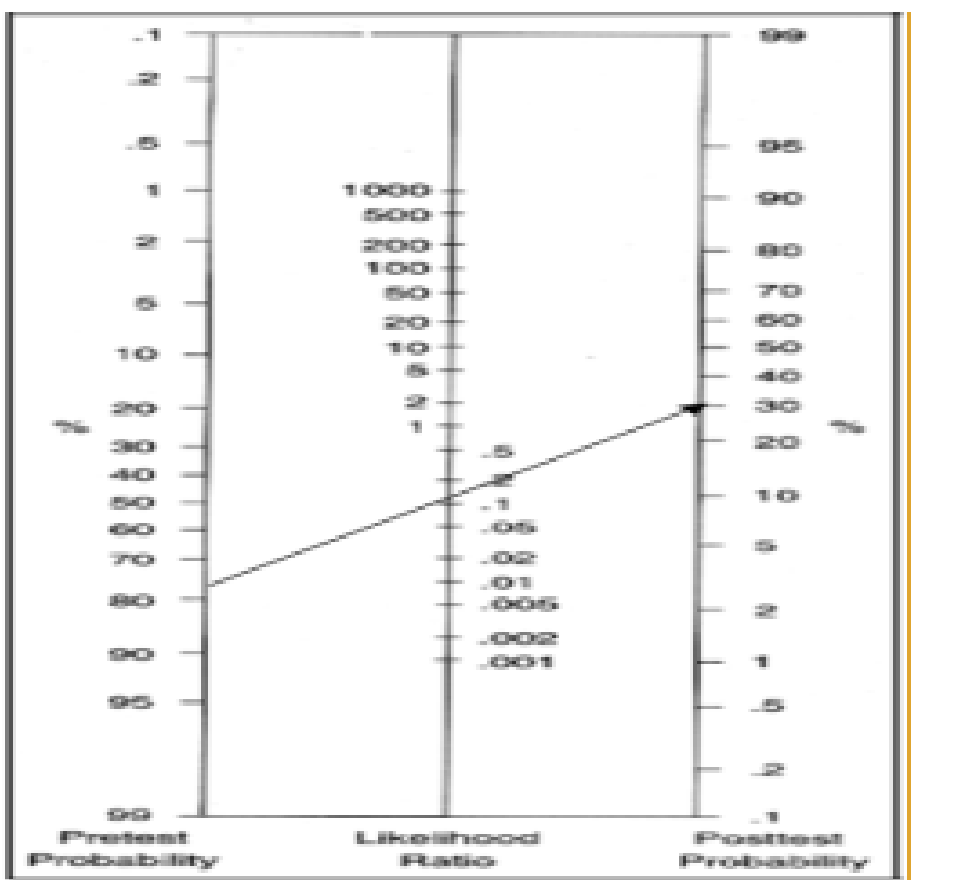


The post-test probability:
80-90% risk of malignancy

Final Histopathology- Follicular variant PTC

Ms. HN, 52/F
Pre-test probability estimate was 0.2 (hospital based prevalence estimate)

Clinical score: 0.072
USG: TIRADS III
FNAC Bethesda III
Integrated score: 0.416
Corresponding LR: **2.382**
The post-test probability:
20-30% risk of malignancy



Final Histopathology- Goitre

REFERENCES :

2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. Bryan R. Haugen et al, Thyroid. 2016 Jan 1; 26(1): 1–133. The Bethesda System for Reporting Thyroid Cytopathology . Edmund S. Cibas et al, Am J Clin Path

CONCLUSION

- Ultrasound has a better sensitivity than FNAC to identify malignancy, however tends to over-estimate in the bargain
- The Integrated score has much higher sensitivity and specificity for predicting risk of malignancy in indeterminate thyroid nodules
- The risk nomograms can be a useful tool for
 1. Predicting malignant potential in the thyroid nodule
 2. Guiding extent of surgery
 3. Prognosticating outcomes
 4. Improved pre-operative counselling