**Ultrasound guided fine needle aspiration (FNA) of thyroid nodules**

**Descriptor:**

Success rate of ultrasound guided fine needle aspiration of thyroid nodules – assessing the percentage of specimens which were adequate and representative for cytological diagnosis.

**Background:**

Thyroid nodules are very common and their prevalence increases with age. Patients are often referred by GP or ENT specialists for ultrasound examination +/- fine needle aspiration after initial clinical assessment. Some present for ultrasound (US) evaluation of a suspected thyroid nodule found as an incidental finding with other imaging examinations such as MRI of cervical spine or CT chest.

Ultrasound is a useful screening tool in the assessment of thyroid nodules, however there is no specific ultrasound feature which has both a high sensitivity and high positive predictive value for thyroid cancer and often the acceptable ultrasound features favouring benignity or malignancy are overlapped. Although the gold standard for diagnostic accuracy is final surgical diagnosis, this procedure is not without appreciable risk.

Fine-needle aspiration cytology is widely accepted as a safe, accurate, sensitive and cost-effective diagnostic procedure in the evaluation of thyroid nodules, with relatively low risk of complications. It helps in patient management especially in patient selection for surgical treatment for malignant nodules and prevents unnecessary tests and surgery in patients with benign nodules.

## The Cycle

**The standard:**

Diagnostic yield varies with technique (type of needle, needle gauge, path chosen), tissue and type of lesion. The standard range of non-diagnostic yield (in percentage) from several studies has been quoted as between 10-30%.

**Target:**

70% of all FNA should be diagnostic on cytology assessment.

## Assess local practice

**Indicators:**

To evaluate the diagnostic yield (percentage of specimens which are adequate for cytological diagnosis) of ultrasound guided thyroid nodule FNA performed.

**Data items to be collected:**

1. Number of patients who underwent FNA of thyroid nodules (first attempt, subsequent attempts/repeat FNA)

2. Number of patients with positive cytology results as classified in the British Thyroid Association’s guideline on the management of thyroid cancer 2007 [6]

3. Number of patients with non-diagnostic yield – data collected should also include whether these patients had previous attempts with ultrasound guided FNA and details of the lesion (eg. Technically challenging location, small nodule, solid, vascular nodule)

4. Radiology report - site of thyroid aspirated, size of the lesion, type of lesion (focal, diffuse) and ultrasound features (eg. homogeneity, vascularity, presence of microcalcification, margins)

5. Pathology report from FNA and final diagnosis from surgical excision (if any) to evaluate accuracy of FNA against gold standard of surgical diagnosis

6. Complications

7. Size and Type of needle used

8. Use of local anaesthetic

9. Radiologist

**Suggested number:**

30 patients

**Suggestions for change if target not met:**

1. Results should be presented and discussed at an audit meeting or MDT involving radiologists, pathologists and cytopathology laboratory technicians, to try and ascertain reasons for inadequate sampling

2. Consider increasing number of passes made during an FNA [7] or varying types of needle used to optimise capillary effect (25G Orange or 22G Black Spinal needle)

3. Initiate use of a logbook to improve follow-up

4. Consider rapid onsite evaluation (ROSE) of aspirate cytology [8]. Involve the cytopathology laboratory technician during the aspiration as their assistance in preparing specimen for slides and instant confirmation on the adequacy of the cellularity of samples obtained can improve positive yield and reduce patient recall rates for repeat FNA [9].

5. Arrange a training session with the cytopathology laboratory technician for improving skills/techniques in preparing specimen for slides

6. Re-audit practice after implementation of changes

**Resources:**

• RIS / PACS and Pathology database

• Secretarial support

• Radiologist (6–12 hours for collecting and reviewing data)

**References:**

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8. Houdek, D., Cooke-Hubley, S., Puttagunta, L. et al. Factors affecting thyroid nodule fine needle aspiration non‐diagnostic rates: a retrospective association study of 1975 thyroid biopsies. Thyroid Res 14, 2 (2021). <https://doi.org/10.1186/s13044-021-00093-2>
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