

# Ultrasound Follow-Up of Small Suspicious Thyroid Nodules: A Service Evaluation

Walsall Healthcare

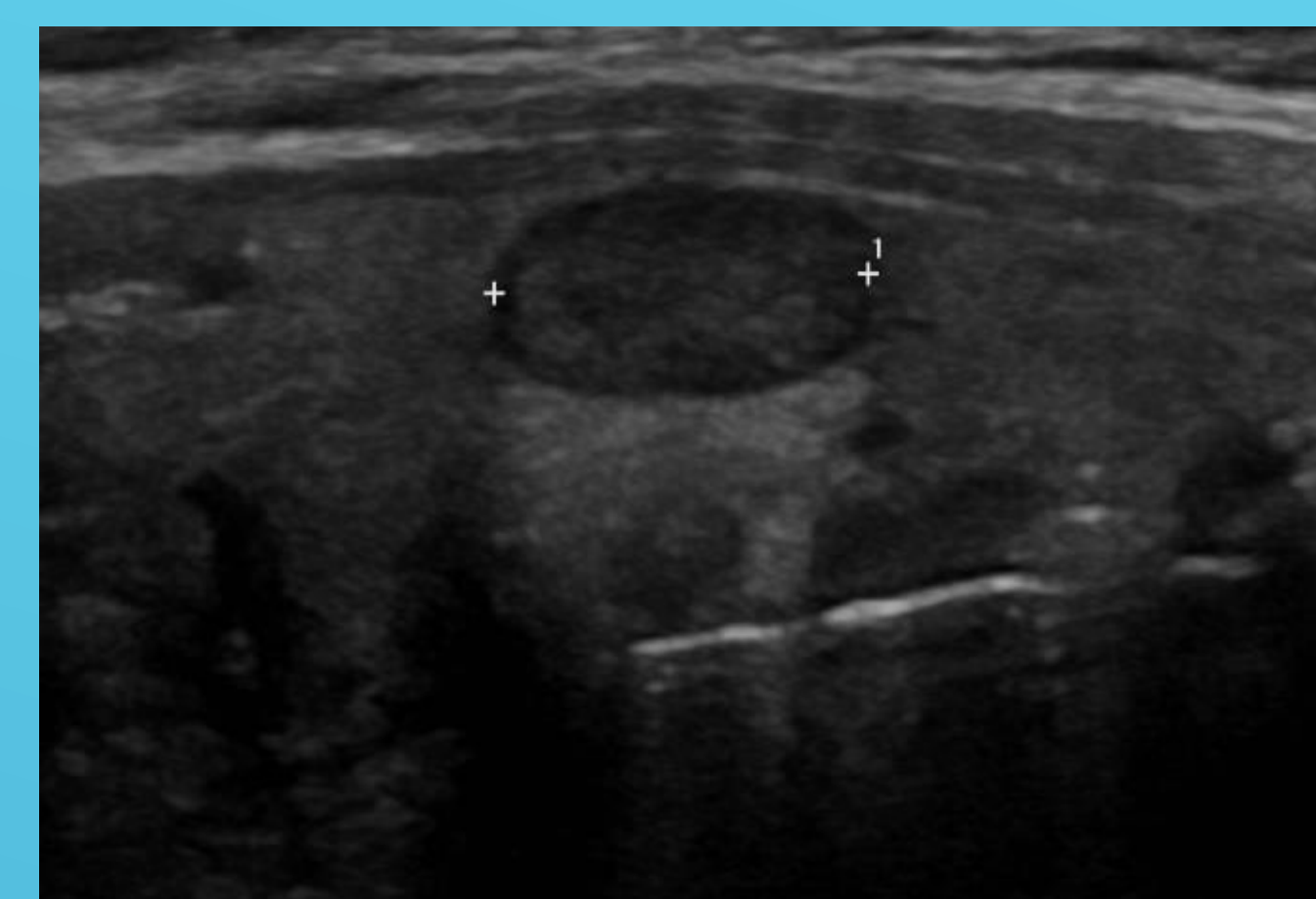


NHS Trust

Steve Klarich & Peter Cogings  
Consultant Sonographers  
Walsall Healthcare NHS Trust

## Introduction

British Thyroid Association (BTA) guidelines state that suspicious thyroid nodules scoring U3 or greater should undergo Fine Needle Aspiration (FNA). The guidelines advise against FNA of suspicious nodules <10 mm unless high-risk factors are present(1). No guidance is provided on how to manage these patients, and local agreement is to monitor nodules with serial ultrasound scans every 6 months to assess for changes. This evaluation of practice at a small DGH aims to assess how well this requirement is adhered to, and how effective this service is at identifying malignant nodules.



Example of a small nodule classified U3 due to hypoechogenicity. Posterior acoustic enhancement suggests cystic content. It has well-defined borders and demonstrated no internal vascularity on colour doppler.

## Methodology

Formal ethical approval was not required for this service evaluation. Search performed on the radiology information system (RIS) for ultrasound examinations of the neck from 2014 with reports containing the following keywords: 'threshold', 'follow up', 'too small' and 'FNA', along with at least one of 'U3', 'U4' and 'U5'.

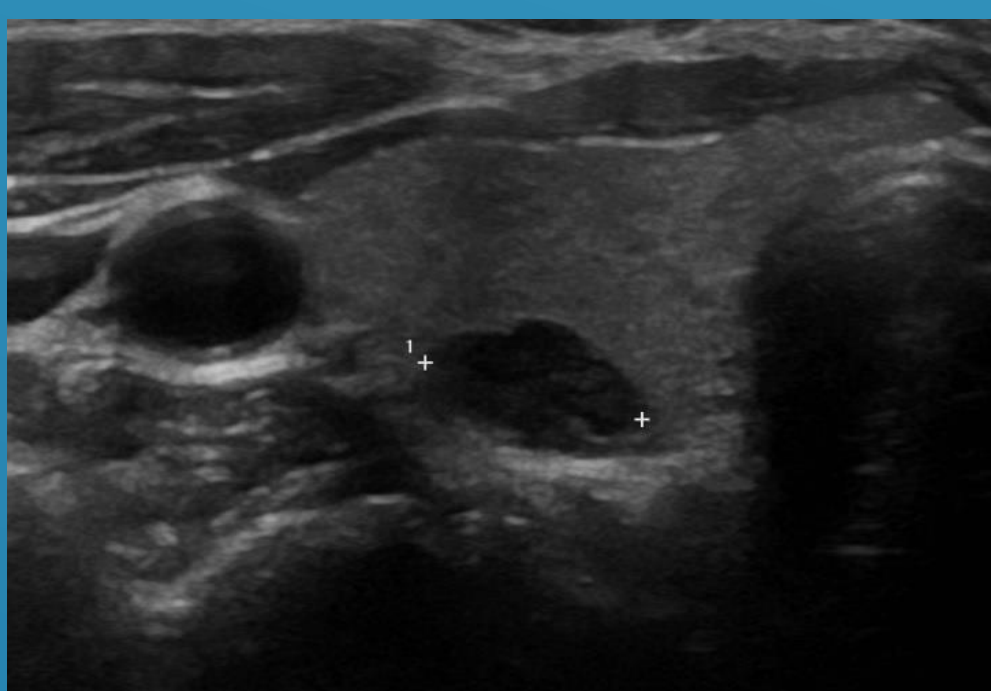
Inclusion criteria: patients with nodule(s) measuring <10 mm graded U3 or higher with at least two scans assessing the same nodule(s).

Exclusion criteria: patients with normal thyroid or only benign nodules and patients with only a single scan. Scan reports were assessed to identify patients matching the inclusion criteria.

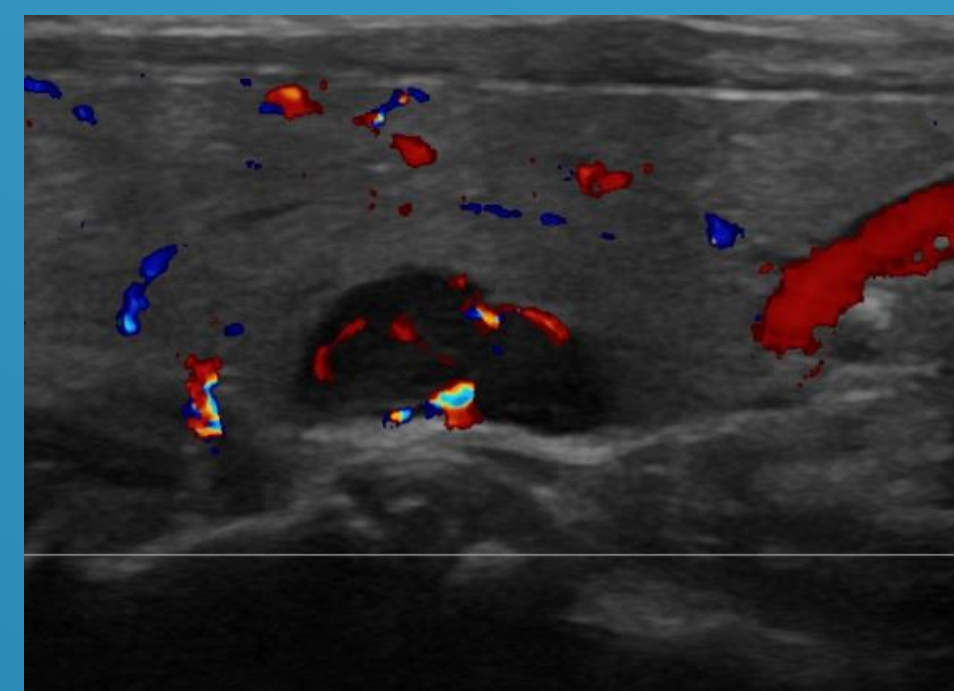
Data extracted from reports: nodule size, U score, interval between scans, whether FNA was performed and if so the cytology result. Data recorded on a tool created in Microsoft Excel. Results analysed to calculate changes in size of nodules at each scan, along with means intervals between scans and number of scans performed overall.

The standard evaluated against was that patients with a small suspicious thyroid nodule should:

- 1) Have a repeat scan performed every six months
  - 2) FNA should be performed if the nodule grows >10 mm, demonstrates extra thyroidal extension or pathological lymph nodes.
- Results also assessed in terms of number of malignancies identified, how many nodules increased in size to >10 mm threshold and how many FNAs were performed.



Example of a small nodule classified U4 due to marked hypoechogenicity, slightly lobulated outline and internal vascularity.



## Results

61 patients matched inclusion criteria, total 65 nodules. Mean nodule size at initial scan was 6.2 mm (range 3 – 9mm); mean nodule size at final scan was 6.3 mm (range 3-12 mm). Mean interval between scans was 6.6 months (range 0.5 - 36 months). Of 145 scan intervals identified, only 14 adhered to 6 months as per local protocols.

Average length of follow up was 14.7 months (range 1 – 47.5 months) On average 3.2 scans were performed per nodule (range 2 – 9 scans). Mean U score at initial scan was 3.0, at the final scan 2.8. In 13 of the nodules, U scoring was downgraded from an initial U3 to U2 at final scan.

Two nodules increased above 10 mm and had FNA cytology. One had a single FNA with thy3a cytology and no further investigations. The other had two FNAs with thy3a and thy3f cytology; histology following diagnostic hemithyroidectomy reported a follicular adenoma. A further 12 FNA procedures were performed on a total of 7 nodules, all of which measured <10 mm. Of these, 83% (10 out of 12) were non-diagnostic. The two diagnostic results were thy3a and thy3f; the latter was shown to be a hurthle cell adenoma on histology following diagnostic hemithyroidectomy.

Summary of Results	Mean	SD	Median	Mode
Number of Scans per nodule	3.2	1.4	3.0	2.0
Scan interval (months)	6.6	5.8	5.0	3.0
Length of follow up (months)	14.7	11.5	12.0	3.0
Initial max. Diameter (mm)	6.2	1.7	6.0	7.0
Final Max. Diameter (mm)	6.3	2.1	7.0	7.0
Initial U score	3.0	0.2	3.0	3.0
Final U score	2.8	0.4	3.0	3.0

## Discussion

The results of this evaluation show that local guidelines for scan intervals are poorly adhered to. Whilst the mean interval between scans was 6.6 months, only 14 out of 145 (9.7%) intervals recorded in the audit were 6 months.

No malignant nodules were identified within the cohort. Results of this evaluation suggest that monitoring of small suspicious thyroid nodules does not identify nodules undergoing malignant growth, most likely because as suggested in the literature, these nodules have very low malignant potential(2).

There is very little difference between the mean nodule diameter at initial scan (6.2 mm) and mean diameter at final scan (6.3 mm) suggesting small nodules do not grow significantly. Only two nodules increased in size beyond the 10 mm threshold, one of which was proven to be benign on histology. The results of this evaluation correlate with findings of previous studies. One study found that planned scan intervals varied between 6 -12 months, and that few patients returned for their scans within the recommended time scales. They also note that > 90% of the nodules under surveillance remained unchanged(3). Another study reported results of ten-year surveillance, with an initial scan 6 months following diagnosis then annual scans after. In this cohort, more than 70% of nodules either did not change in size or were stable, and progression of nodule size was linked to an initial size of 7 mm or greater at diagnosis(2).

Thyroid microcarcinomas are considered to have an excellent prognosis even if left untreated, and early surgery has been found to provide little improvement to 10-year survival rates(2,4). Close monitoring is becoming more prevalent as a conservative approach although there is concern that, once diagnosed, patients and clinicians may be dissatisfied with conservative rather than surgical management(5). This is one factor that could lead to a reluctance to perform FNA cytology, as it will not lead to change in management in these patients.

What is not clear from the results of this evaluation is a consistent end point to surveillance of nodules. U scoring was downgraded from U3 to U2 in 13 nodules, which is a logical point at which to end surveillance if the nodule is shown to be stable in size.

How to manage small suspicious thyroid nodules remains an area of contention. Multiple guidelines give a size cut-off below which only the most suspicious nodules should have FNA performed(6), however this leaves a significant number of nodules that potentially require monitoring.

## Conclusion

The local protocol of 6-monthly serial monitoring ultrasound scans for suspicious thyroid nodules < 10 mm is poorly adhered to with significant variance in both scan intervals and length of follow-up. Results from this evaluation suggest that when undergoing ultrasound monitoring these nodules do not significantly change in size and are at low risk of malignant change.

## References

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