

## Audit cycle of head and neck fine needle aspiration cytology service over a three-year period

The College's Clinical Effectiveness department wishes to encourage high-quality clinical audit. We therefore periodically publish interesting examples of audits that have been successfully evaluated through our clinical audit certification scheme.

### Background

As part of service improvement, smaller Trusts in the NHS are being incorporated into larger Trusts.<sup>1</sup> Central Manchester University Hospitals NHS Foundation Trust (CMFT) took over a smaller NHS Trust in April 2012 and provision of the cellular pathology service (histopathology and cytopathology) by CMFT commenced in January 2013. A series of information-giving sessions were provided by the CMFT cytology team to the relevant staff in endoscopy (bronchoscopy), radiology, Ear Nose and Throat (ENT) and specimen reception in December 2012 and January 2013.

During these sessions, information on specimen collection, preparation and completion of non-gynaecological (NG) cytology request forms for all cytology samples were verbally given and the NG cytology user manual available via the intranet was publicised. In addition, consumables and request forms were provided to all departments and an oral presentation with a question-and-answer session on the cytology service was given. At the central site, that is Manchester Royal Infirmary (MRI), biomedical scientists (BMS) attend fine needle aspiration (FNA) requests, ad hoc and in clinics, to provide assistance in sample preparation. They also provide on-site adequacy assessment at head and neck (H&N) clinics. This BMS-led service, together with the high standard of diagnoses and reporting by the consultant cytopathology staff of CMFT, has resulted in an excellent H&N service with resultant patient benefits. Such a service provision model was not in place at the sub-site at the time of transfer of the cytopathology work.

An initial audit (2013) and re-audit (2014) found that the FNA adequacy rate at the sub-site was notably lower than at the central site (MRI). Plans were implemented to improve this situation including pathologist/BMS-led sample collection and preparation technique training sessions for clinicians, discussions with the ENT clinical leads and dissemination of the audit findings to all involved with the service. A further re-audit (2016) was performed to assess the outcomes of the implemented measures. However, in this re-audit, a standardised adequacy rate was thought to be a suitable method for comparison of the service at the sub-site. A literature search was conducted to find a suitable

adequacy rate and a comprehensive meta analysis published in the British Journal of Radiology gave an average adequacy rate of 90.7% based on 932 articles.<sup>2</sup> This was adopted as the audit standard after consultation with the clinical leads.

### Aim and objectives

- To assess the adequacy rate of head and neck (H&N), including thyroid, fine needle aspiration cytology samples taken at a sub-site of CMFT.
- To compare the 2016 figures with those found in the previous audits (2013 and 2014).
- To compare the adequacy rate against a more suitable standard sourced from published literature.

### Standards

Clinical Pathology Accreditation Standard E3.1d: Laboratory management shall establish a procedure(s) for the specimen collection and handling ensuring that the specimen is collected correctly. Although there are no documented national criteria, the cytology department at CMFT has set out its guidelines in the NG cytology user manual available on the intranet.<sup>3</sup>

The corresponding ISO 15189:2012 standards for medical laboratories are:

- 5.4: Pre-examination processes
- 5.5: Examination processes

There is no specific head and neck FNA adequacy rate guideline established. The cytology department has taken an adequacy rate from meta analysis data published in the British Journal of Radiology. This research evaluated the data from 932 articles on the subject.<sup>2</sup> The average adequacy rate from this research was calculated as 90.7% and this rate is used for the present audit.

### Method

#### Sample/population

All H&N FNA samples, including thyroid, received from the CMFT sub-site during a three-month time period, 1 January 2016 – 31 March 2016.

**Data collection**

The specimen data was retrieved and analysed from the laboratory computer systems, the relevant request forms and issued reports. The data was analysed using Excel.

**Results**

**FNA adequacy**

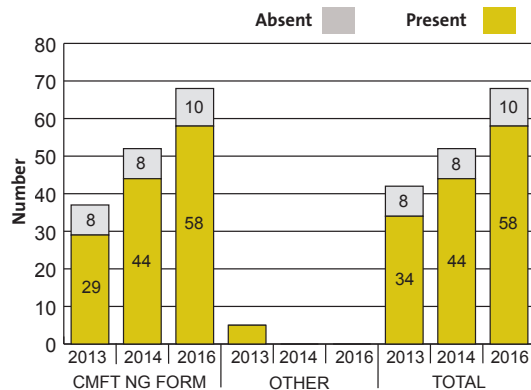
During the three-month time period, 68 FNA samples from the H&N, including thyroid, were received. As seen in the table below, there was an adequacy rate of 94.1% for these samples, which represents an improvement from the 80.8% adequacy rate, seen at the last re-audit of the same time period in 2014.

Standard	Adequacy (%) 2013	Adequacy (%) 2014	Adequacy (%) 2016	Change
Adequacy rate $\geq$ 90.7%	50% (19/38)	80.8% (42/52)	94% (64/68)	↑

**Request forms**

All samples were received on the correct NG cytology request form in the current audit, the same as the previous audit of 2014. In the previous audit, essential data was completed on 84.6% of request forms as compared to 85.3% in the current audit (figure 1).

Figure 1: Type of request form and essential data figures



**Type of FNA**

The number of FNAs performed under radiological guidance has steadily increased from 21.4% (2013) to 71.2% (2014) and finally this has risen to 79.4% in the current (2016) audit (figure 2).

**FNAs by department**

The radiology department had a very slight decrease in the number of FNAs performed (n=1) but the overall percentage dropped from 69.2% (2014) to 51.5% (2016). The ENT department saw a marked sample number increase (n=15) which equates to a rise from 30.8% to 45.6%. This can be attributed to the implementation of a Wednesday afternoon dedicated ENT H&N clinic (figure 3).

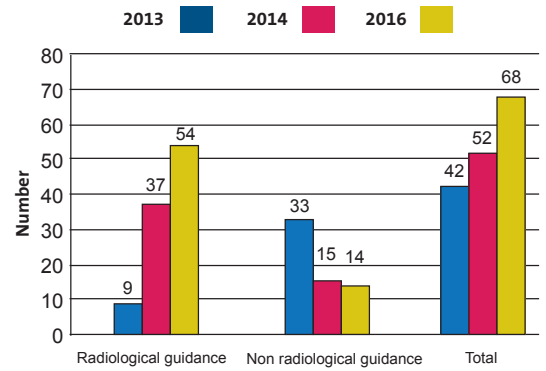


Figure 2. Number of FNAs performed under radiological guidance

Although the number of FNAs performed by the radiology department fell, as seen in figure 2, the proportion of FNAs performed under radiological guidance actually increased. This was secondary to the appointment of a consultant ENT surgeon able to perform ultrasound-guided FNAs.

**FNA adequacy by department**

In the previous (2014) audit, the adequacy rate of samples taken at the radiology department was 91.7%, which has increased to 94.3% in the current audit. Following the implementation of BMS on-site adequacy assessment for the Wednesday afternoon H&N clinics in December 2015, the ENT department adequacy has dramatically increased from 56.3% to 93.5% (figure 4 – overleaf).

**Conclusions**

This 2016 re-audit has shown an overall improvement in the adequacy of H&N, including thyroid, FNAs performed at the CMFT sub-site. The adequacy rate of samples taken in the radiology department increased from 91.7% to 94.3%. The ENT department showed a dramatic improvement in sample adequacy rate rising from 56.3% to 93.5%. This puts the overall sample adequacy rate at 94.1%, which is above the standard used for this audit and represents full compliance. The

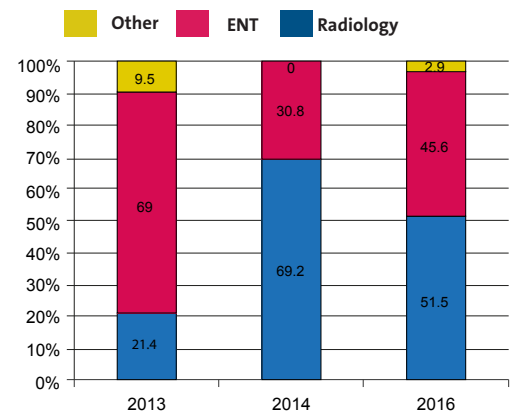
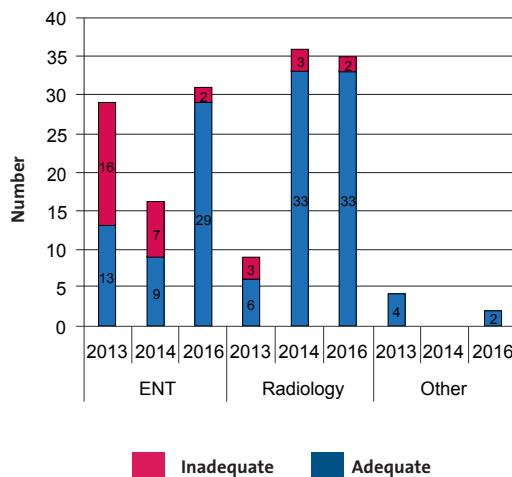


Figure 3. Percentage of FNAs by department

Figure 4: Adequacy by department



2014 post-audit review of the H&N service at the sub-site highlighted sample taker training and service provision as areas where improvements could be made. In December 2015, a weekly ENT H&N clinic with biomedical scientist attendance was introduced together with sample taker training. Every sample taken at these clinics was evaluated on-site for adequacy. These measures seem to have addressed the low adequacy rates seen at the ENT clinics in the past.

A reduction in the number of inadequate samples will result in reduced need for repeat sampling and prevent open surgery. This may also lead to

more rapid diagnosis with reduced patient inconvenience and avoid possible anxiety. This audit cycle demonstrates that in the era of merging NHS Trusts, service improvement is possible by implementation of key changes such as teamwork between cytopathology and surgeons, adequate training to use ultrasound scan equipment and adequacy assessment in clinics by a BMS. This improves the quality of care we provide to our patients.

**Dr Durgesh Rana**  
**Dr David Shelton**  
**Dr Sakinah A Thiryayi**  
 Consultant cytopathologists

**Mr Chaitanya Gadepalli**  
 Consultant ENT surgeon

**Ms Nadira Narine**  
 Clinical Scientist, Non Gynaecological Cytology

**Mr David Slater**  
 Specialist biomedical scientist

**Acknowledgement of assistance from Sophie Black, Clinical Audit Facilitator**

**Central Manchester University Hospitals NHS Foundation Trust**

**References**

1. The King's Fund. *Foundation trust and NHS trust mergers*. Accessed May 2017. Available at: <https://www.kingsfund.org.uk/publications/foundation-trust-and-nhs-trust-mergers>
2. Ganguly A, Burnside G, Nixon P. A systematic review of ultrasound-guided FNA of lesions in the head and neck – focusing on operator, sample inadequacy and presence of on-spot cytology service. *Br J Radiol* 2014;87:20130571.
3. Central Manchester University Hospitals. *Laboratory medicine*. Available at: [www.cmft.nhs.uk/laboratorymedicine](http://www.cmft.nhs.uk/laboratorymedicine)

The team in Manchester

