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RCSLT POSITION PAPER

Fibreoptic endoscopic evaluation of swallowing (FEES) position paper

ROYAL COLLEGE OF SPEECH & LANGUAGE THERAPISTS

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Amendments (May 2021)
Small amendments have been made to page 34 with information added clarifying Intermediate Life Support (ILS) requirements for community FEES

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Contents

1. Key recommendations

i. It is the position of the RCSLT that FEES is within the scope of practice for speech and language therapists (SLTs) with expertise and specialist training, and should be performed as part of a multidisciplinary team (MDT) approach to dysphagia management.

ii. FEES necessitates an in-depth knowledge and a high level of competence in dysphagia to ensure safe and best practice, appropriate clinical use and optimal patient outcomes. In the UK, FEES should continue to be a speech and language therapy-led assessment.

iii. The weight of evidence supporting the use of FEES for aspiration detection and dysphagia management applies across a broad range of patient groups and, as such, should be utilised widely.

iv. FEES contributes significant cost benefits, efficiency and added value in terms of quality of patient care when compared with clinical swallowing evaluation. The positive impact on patient outcomes, such as earlier return to oral intake or tracheostomy weaning, means that FEES should be considered an **essential tool** available to all speech and language therapy dysphagia services.

v. Access to instrumental assessment, whether videofluoroscopy (VFS) or FEES, should be guided primarily by clinical factors and Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) rather than by available resources. Service commissioners should support SLTs to achieve equitable access for all dysphagia patients.

vi. More research is needed to further substantiate the evidence supporting the added value of FEES, and is necessary to enable the development of more services and access for patients.

vii. Patient suitability for FEES must be assessed on an individual basis with careful consideration of the risks and benefits. Particular attention should be paid to the need for medical assistance for patients deemed high-risk or vulnerable because of underlying medical issues.

viii. SLTs practising FEES should continuously monitor and evaluate the appropriateness, efficacy and safety of their FEES procedures through audit or service evaluation.

ix. FEES should be performed in a safe and appropriate setting with suitable equipment and two FEES trained personnel (with the exception of expert level 3). SLTs performing FEES must undergo regular mandatory training in life support techniques appropriate to the setting.

x. Clinical and process outcomes of FEES regarding the benefits to patients and their care should be highlighted to other professionals, patient and carer groups and service commissioners through forums and publications.

xi. FEES may assist MDT decision-making in tube feeding versus oral 'risk feeding' ethical dilemmas, where FEES is in the patient's best interests and any risks and discomfort are outweighed by the potential benefits.

xii. SLTs should use proper equipment and be adequately resourced to carry out FEES procedures, both safely and efficiently. When equipment failures occur, risks and consequences for patient care, such as delays to oral feeding, increased respiratory infection or failed hospital discharge, should be escalated to service managers and commissioners.

xiii. SLTs must undertake appropriate training to perform FEES and take individual professional responsibility for achieving and maintaining competent practice. The numbers of procedures for training represent minimum requirements and the individual must seek further training when these are insufficient for competency attainment.

2. Introduction

The purpose of this document is to define best practice for the use of the instrumental assessment FEES and to set out the knowledge, skills and training required to achieve competency and safe and quality care.

This document will be of interest to SLTs working within the field of dysphagia and collaborating professionals: such as ENT surgeons, respiratory consultants, neurologists, service managers and commissioners of services involving patients with dysphagia.

This updated FEES position paper follows on from the original publication in 2005 and previously revised versions in 2008 and 2015. During this period, FEES services have developed across the UK, but there remains inequity of access for patients between settings and clinical groups, and between and within individual healthcare trusts. Access to funding continues to significantly limit FEES service growth despite the efforts of SLTs and professional colleagues. There has been an increase in the recognition by other professionals of the enormous value of FEES in improving quality and efficiency of patient care. MDT support for speech and language therapy FEES business cases is vital for developing services and bridging the gaps in services. More work is needed to highlight the benefits of FEES to others to facilitate better patient access.

The use of FEES in paediatrics has been slow to progress in the UK but is beginning to develop, particularly in the neonatal and young infant population. This document acknowledges the emerging evidence in the field of paediatric and neonatal FEES and the challenges of providing this service in this highly specialist population.

Access to FEES training has improved with the development of more courses and a gradual increase in the cohorts of expert level 3 and level 2 FEES practitioners. However, issues remain regarding limited availability of supervision, funding for external training and lack of time to develop services due to rising SLT caseloads and complexity of patients. The development of an RCSLT FEES/VFS Clinical Excellence Network (CEN) has provided some additional support for practitioners, but more local FEES forums would be beneficial. International training and competency frameworks are increasingly available but practitioners should meet RCSLT standards.

There have been rapid advancements in technology in recent years resulting in better portability, imaging and accuracy of FEES. New evidence from research, increased expertise and developments in procedure specialisation for specific populations have all led to the need for this position paper update.

It is not within the scope of this document to provide guidance on Fibreoptic Endoscopic Evaluation of Swallowing with Sensory Testing (FEESST). This is a modification of FEES which tests the Laryngeal Adductor Response (LAR) using a calibrated air puff delivery device. Reference is made to FEESST studies in the supporting literature for their contribution to the evidence base regarding sensory assessment. The equipment used for FEESST is no longer available; therefore a touch test to the arytenoids to assess sensation is now used. A comparison of these two methods of sensory testing showed that the air pulse method was not associated with penetration and aspiration, but significant sensory loss assessed by the touch method was associated with compromised airway protection (Kaneoka et al 2015). While the touch method may have more clinical relevance, pressure variability has the potential for diagnostic inaccuracy (Langmore et al, 2017).

Endoscopy for other purposes, such as Inducible Laryngeal Obstruction (ILO) when this occurs in the absence of any dysphagia signs or symptoms, Tracheoscopy, Translaryngeal or Transnasal Oesophagoscopy (TNO) assessments, or endoscopy carried out by a non-speech and language therapy workforce, are also presently outside the scope of this document.

3. Process

3.1 Scoping the evidence

A literature review was undertaken to capture relevant research papers published since the 2015 revision. Papers that did not contribute to knowledge of the FEES procedure itself, but that included FEES as an examination tool, were excluded. It is not the remit of this position paper to include an extensive systematic review or detailed critical appraisal of the literature.

3.2 Writing

The position paper was updated by the lead author and the supporting author group with suggested amendments from member consultation and RCSLT clinical advisers. Two members had been involved in all previous versions, to lend some continuity, and all SLT members (of the supporting author group) represented a range of clinical specialties, settings and the four UK countries. Opinion was gained from ENT consultant surgeons acting as advisers.

3.3 Consultation

The RCSLT membership, board members and dysphagia advisers, relevant CENs, international FEES experts and wider stakeholders - such as ENT UK - were invited to take part in the consultation process. Service users also acted as advisers throughout the development of the position paper. The expert group reviewed all feedback, made amendments as appropriate, and recorded all decisions for approval or rejection of comments.

4. The purpose of FEES

FEES is an instrumental assessment of swallowing used by SLTs, in which a flexible nasendoscope (digital or fibreoptic) is inserted transnasally to directly visualise naso-/oro- and laryngopharyngeal structures, secretions, sensory response and pharyngeal swallow function. Saliva swallowing can be viewed in the absence of food and/or liquids, and swallowing of food and liquid trials are assessed with the scope in situ. FEES was first devised in 1988 by Professor Susan Langmore as a four-part procedure, (see Appendices for sample FEES protocol). FEES enables accurate, in-depth assessment of dysphagia and detection of aspiration, particularly when silent. Penetration or aspiration occurring pre- and post-swallow are easily viewed, but a low-scope view, post-swallow, of the vocal folds and subglottic shelf is needed for detection of penetration or aspiration that may have occurred during the swallow ('white-out'). Use of a standard protocol and rating scales is recommended (also, see Appendices).

FEES enables a clearer understanding of dysphagia aetiology, severity and prognosis, and facilitates management decisions, such as safety of oral feeding, or need for tube feeding. In addition, FEES can inform and evaluate dysphagia management through the use of therapeutic strategies and biofeedback. The benefits of FEES include portability to the bedside, repeatability and no exposure to radiation. The direct view of the larynx and upper airway means that FEES can inherently influence other MDT treatment decisions, such as tracheostomy weaning.

5. Evidence base

Papers were selected for their contribution to the FEES knowledge base in specific categories: validity, reliability, clinical groups, efficacy and utility, safety, impact of the nasendoscope on swallowing and clinical outcomes.

5.1 Validity

A number of studies have established the validity of FEES in areas such as detection of aspiration, penetration and residue in comparison with VFS (Coffey et al 2018; Reynolds et al 2016; De Silva et al 2010; Kelly et al 2006, 2007; Rao et al 2003; Perie et al 1998; Aviv 1998; Wu et al 1997; Kidder et al 1994; Langmore et al 1991). A systematic review and meta-analysis of the literature found that FEES showed greater sensitivity than VFS for detection of aspiration, penetration and pharyngeal residue. Sensitivity for premature spillage and the specificities of both tests were similar (Giraldo-Cadavid et al, 2017).

5.2 Reliability

A number of studies have shown good or excellent intra- and inter-rater reliability for FEES and how reliability can be improved through the use of protocols and standardised rating scales (Steele et al 2017; Nunes et al 2016; Butler et al 2015; Baijens LW et al 2014; Cunningham et al 2007; Kelly et al 2007, 2006; Colodny 2002; Leder 2000; Logemann et al 1998; Rosenbek et al 1996). More studies are needed to examine whether FEES interpretation can be optimised through standardised scoring of swallowing parameters and terminology. Factors that may affect FEES reliability include:

- Level of experience and expertise of clinicians
- Lack of a standardised FEES scoring system
- Image quality
- Variability in bolus trials and consistencies.

The visual recognition of laryngopharyngeal structures during swallowing has been studied using high-speed digital (4,000 frames per second) (fps) vs standard frame rate (30fps) videos of FEES. Raters found that high-speed allowed for better visibility due to the ability to capture continuous motions of structures (Aghdam et al 2017). Slow-motion playback may enhance reliable interpretation.

The 8-point New Zealand Secretion Scale (NZSS), encompassing location, amount and response components, has proved reliable without the need for training. The NZSS showed significant correlation with the Penetration Aspiration Scale (PAS) (Rosenbek 1996) and significant association between pneumonia, PAS, high NZSS (>4) and tracheostomy (Miles 2018; Miles & Hunting 2018). Results suggest that the NZSS has some potential to predict pneumonia outcome and should be utilised on FEES for secretion assessment.

The Pharyngeal Squeeze Manoeuvre (PSM), scored on phonation of high-pitched /i/, is reliable if rated as a binary measure (normal or abnormal) rather than graded normal, diminished or absent (Rodriguez et al 2007). The PSM correlates well with the pharyngeal constrictor ratio on VFS (Fuller et al 2009) and is a valid measure of pharyngeal constriction during swallowing.

FEES was found to be more sensitive than VFS for locating post-swallow residue at more anatomical sites (11/15) but residue was also rated more severely (Pisegna et al 2016). Kelly et al (2006, 2007) also found a tendency for more severe rating and moderate inter-reliability for residue scoring on FEES. Opportunities for peer-rating of FEES recordings is suggested to prevent over-cautious recommendations.

The Yale Pharyngeal Residue Severity Rating Scale has been shown to be a valid tool for residue rating on FEES with good to excellent inter-, test-, retest- and intra-rater reliability for valleculae and pyriform residue (Neubauer et al 2015). A study compared the use of a Visual Analogue Scale (VAS) with an ordinal scale for residue on FEES, and found that perceptual judgements reflected unequal intervals and that a VAS enables greater precision (Pisegna et al 2018). This may be a development for the future.

Several studies have examined the use of the PAS with FEES with moderate to excellent inter- and intra-rater reliability scores, regardless of clinician experience (Butler et al 2015; Colodny 2007; Kelly 2006, 2007). The PAS can be used reliably with FEES and should be incorporated into interpretation.

SLTs should practice rating FEES procedures with other FEES-trained SLTs to maximise inter- and intra-rater reliability.

The evidence for the use of dyed vs undyed boluses is mixed. Leder (2005) found no effect on the reliability of aspiration detection; however, Marvin et al (2016) found repeat-rater reliability was better for dyed liquids, and dye allowed for improved judgement of deeper airway invasion.

The FEES-Tensilon test for myasthenia gravis was found to have excellent inter- and intra-rater reliability for pharyngeal residue severity, and was consistent irrespective of rater experience (Im et al 2018).

Similarly, the FEES-Levodopa test was reliable and sensitive in differentiating responders from non-responders in patients with advanced Parkinson's disease in ratings of premature spillage, penetration/aspiration and residue (Warnecke et al 2016).

Finally, Narrow Band Imaging (NBI) is an emerging technology which may provide better visualisation of the bolus and leads to markedly higher detection rates of pathological findings (Nienstedt et al 2017).

5.3 Clinical groups

Many studies have described the benefits of FEES across a spectrum of clinical groups, including:

- **Stroke, neurogenic dysphagia** (Braun et al 2018; Wirth 2017; Lindner-Pfleghar et al 2017; Warnecke et al 2009, 2006; Leder 2002)
- **Critical care** (Ng 2019; Scheel et al 2016; Warnecke et al 2013; McGowan et al 2011; Ajemian et al 2001; Hales et al 2008, Hafner et al 2008)
- **Progressive neurological/neuromuscular disease** (Printza et al 2019; Im et al 2018; Pflug et al 2018; Fattori et al 2017; Warnecke et al 2016; Manor et al 2013; Amin et al 2006; Leder 2004)
- **Head and neck cancer** (Simon et al 2019; Florie et al 2016; Deutschmann et al 2013; Schindler et al 2010; Wu et al 2000; Denk et al 1997)
- **Traumatic brain injury** (Leder 1999)
- **Burns** (Vo et al 2016)
- **Spinal cord injury** (Wolf et al 2003)
- **Paediatrics and neonates** (Reynolds et al 2016; Sitton et al 2011; Leder 2000; Hartnick et al 2000; Link et al 2000; Willging et al 1995)
- **Partial laryngectomy** (Pizzorni et al 2018) and **laryngectomy** (Coffey et al, 2018)
- **Laryngotracheal stenosis** (Clunie et al 2017; Lennon et al 2016).
- **Chronic Obstructive Pulmonary Disease (COPD)** (Regan et al 2017; Masiero et al 2008).

This is not an exhaustive list but it provides examples of the versatility of FEES.

5.4 Efficacy and utility

Recent studies on this aspect of FEES have focused on certain clinical areas. A number of studies have shown the utility of FEES in critical care generally and in patients with critical illness polyneuropathy and post-intubation (Borders et al 2019; Ponfick et al 2015; Scheel et al 2015; Hafner et al 2008). FEES accurately assessed swallowing in cuff-inflated tracheostomised patients and showed that an inflated cuff does not necessarily preclude effective swallowing (Wallace et al 2013; McGowan et al 2007).

FEES also detected aspiration missed during clinical bedside assessment in tracheostomised patients (Hales et al 2008) and detected laryngeal injury from intubation and critical illness (Ng et al 2019; Ambika et al 2018; Wallace et al 2016; McGrath & Wallace 2014). In 100 tracheostomised neurological patients, decannulation decisions based on FEES findings allowed for faster and safer decannulation with a 1.9% re-cannulation rate (Warnecke et al 2013).

Wi-Fi tablet-based FEES equipment was compared with a conventional wired FEES system for the MDT management and functional outcome of hospitalised dysphagia patients. MDT ward rounds were more efficient, Functional Oral Intake Scores (FOIS) increased significantly and mortality rates were lower with the Wi-Fi-based system (Sakakura et al 2017).

The clinical utility of FEES in infants with persistent respiratory symptoms was found to be effective in detecting silent aspiration while avoiding the need for barium or radiation exposure (Grammeniatis et al 2018).

5.5 Safety

Studies show that FEES is a safe procedure with a low incidence of reported complications. With 27 cases of adverse effects occurring in 6,000 FEES procedures, 3.7% were aborted due to gagging or significant aspiration, compared with 3.1% of VFS (Langmore et al 2001). Aviv et al (2000) reported no incidence of vasovagal response or laryngospasm and a low (0.6%) incidence of self-limiting epistaxis in 500 FEESST examinations (n=253). These findings were similar to those of Cohen et al (2003), who found 1.1% for self-limiting epistaxis, and no reported vasovagal, laryngospasm or airway obstruction episodes in 349 FEESST examinations. Pre- and post-examination heart rates also did not differ significantly. In a multi-centre trial of 2,401 patients, complications were reported

in 2% of examinations, all self-limited and resolved without sequelae (Dziewas et al 2019).

No bradycardia, tachycardia or laryngospasm episodes were seen in FEES on 300 acute stroke patients, but the incidence of epistaxis was higher than in previous reports (6%) all of which were self-limiting (Warnecke et al 2009). Nacci et al (2016) observed minor side-effects in 2,820 FEES, 48% of whom were neurological patients. Complications included four cases of epistaxis, three of vasovagal syncope and two cases of laryngospasm in patients with Amyotrophic Lateral Sclerosis (ALS), which spontaneously resolved after some difficulty. This highlights the overall safety of FEES but the need to be aware of the increased risk of laryngospasm in patients with neurodegenerative disease.

5.6 Effect of the nasendoscope on swallowing

Swallowing was examined during VFS with and without a nasendoscope in situ in normal healthy subjects. No difference in swallow duration, PAS scores or the number of swallows required to clear a bolus was found. The presence of the nasendoscope in this study had no effect on swallow physiology (Suiter 2007). In addition, correctly placed nasogastric tubes (NGTs) did not cause a worsening of stroke-related dysphagia. Except for two cases in which material stuck to the NGT and penetrated the laryngeal vestibule post-swallow, no changes to the amount of penetration and aspiration were noted with the NGT in place as compared with the no-tube condition. Malpositioning of the NGT was identified in 5/100 cases with subsequent increase in penetration (Dziewas et al 2008).

5.7 Clinical outcomes

No significant differences were found in the incidence of pneumonia or the pneumonia-free intervals over the course of one year, in patients undergoing either FEESST or VFS to guide dysphagia management (Aviv 2000). Either of these examinations was effective for assessing and managing dysphagia, but FEESST was less costly and more convenient. FEES in 241 neurological patients resulted in a change of diet regime in 70% which led to a lower pneumonia rate (36% to 50%) and a lower mortality rate (3.7% vs 11.3%) (Braun et al 2018). In a study of 2,401 cases, more than 50% of FEES led to changes in feeding strategies, and in the majority of cases in which the oral diet was upgraded (Dziewas et al 2019).

The Fibreoptic Endoscopic Dysphagia Severity Scale (FEDSS) may be useful for stroke patients, owing to correlations with the need for intubation, incidence of pneumonia and modified Rankin score of independence at three months (Warnecke et al 2009).

A six-year retrospective review of children with complex feeding disorders found that neurological diagnoses were associated with inability to achieve total oral feeding, but long-term feeding status was not significantly associated with initial FEES findings (Sitton et al 2011).

6. FEES indications and outcomes

As with any instrumental assessment for dysphagia, FEES should be preceded by a clinical swallowing assessment in order to determine the dysphagia hypothesis, clinical indications and questions, appropriateness and safety. Since FEES and VFS utilise different visualisation modalities, some patients benefit from both tools in order to gain a comprehensive picture of their dysphagia, and progress throughout recovery or deterioration in health, as their needs change.

The choice of instrumental assessment should be guided by clinical indications rather than resources (see Appendices). If selection is based on non-clinical factors such as availability or urgency, this should be documented and audited to assist business cases for service development.

IR(ME)R requires clinicians to reduce exposure to ionising radiation from VFS procedures as far as possible (RCR 2015); hence if a clinical question can be answered appropriately using FEES, this should be the assessment of choice.

6.1 Clinical indications for FEES

FEES can be performed when there is a clinical need to assess (Langmore 2001):

- Velopharyngeal sphincter and nasal regurgitation
- Laryngopharyngeal structures, mucosa, tone and function
- Laryngopharyngeal sensation and laryngeal adductor reflex sensitivity
- Vocal fold mobility
- Secretion management
- Ability to swallow real foods and fluids
- Penetration, aspiration and airway protection
- Laryngopharyngeal residue
- Swallow fatigue over time
- Impact of therapeutic interventions and biofeedback on swallow function.

FEES is also indicated when there is a need for a conservative assessment because of the lack of necessity to carry out oral trials; for example: aphagic patients, and those with extremely high aspiration risk or fragile respiratory status.

See Paediatric section 11.2 for clinical indications specific to this population.

6.2 Evaluation of underlying issues co-existing with dysphagia

FEES is beneficial for assessment of the following issues, which could co-exist with dysphagia:

- Excessive saliva secretions and secretion aspiration risk
- Dysphonia
- Post-laryngopharyngeal surgery
- Post-radiotherapy changes to structures
- Suspected:
    - Recurrent laryngeal nerve injury
    - Laryngopharyngeal reflux (LPR) and associated injury, hypersensitivity or muscle tension dysphagia
    - difficult airway, oedema or vocal fold palsy and their potential impact on MDT tracheostomy weaning and decannulation plan
    - unrelated cough
    - intubation trauma
    - burns inhalation injury to oropharynx or laryngopharynx
- Impact of ventilation, Above Cuff Vocalisation (ACV), cuff deflation and a one-way speaking valve on the larynx, secretions and aspiration risk
- Respiratory disorders such as ILO and COPD.

6.3 Practical indications

FEES would be the assessment of choice for:

- Observation of:
    - swallowing with specific food items or medications such as tablets
    - the impact of fatigue over longer periods of time than are possible with VFS
- Patients who cannot undergo VFS, eg with difficult positioning, immobility or medical instability or who cannot access the radiology suite
- Patients in critical care
- Tracheostomy patients when cuff deflation is not achievable, and cuff is inflated
- Additional visual feedback to increase patient insight and compliance, without the risks of radiation exposure.

6.4 Outcomes

FEES clinical and process outcomes may include:

- Aetiology and severity of dysphagia
- Integrity of laryngopharyngeal anatomy and swallow physiology
- Further investigation or management of reflux/regurgitation

- Secretion management strategies, ie need for pharmacological agents or botulinum neurotoxin
- Sensory impairment and enhancement
- Safety of oral feeding, therapeutic tastes and swallowing of medications
- Optimum bolus consistency, size, delivery and real foods to avoid
- Swallow postures, strategies or manoeuvres
- Therapy exercises and techniques, including manipulation of taste and temperature
- Need for nasogastric or gastrostomy tube feeding
- Risk feeding consideration
- Benefit and safety of ACV or a one-way speaking valve
- Specific conditions for oral intake, ie environment, timing, cuff deflation
- Safety of tracheostomy decannulation
- Timing and indicators for repeat FEES examination
- Need for VFS
- Onward referral, ie to ENT or neurologist
- SLT review or discharge.

7. Patient group suitability and identification

7.1 Patient group suitability

FEES is suitable for a broad range of patients but must be decided on an individual case basis. This is a non-exhaustive list:

- Acquired neurological disorders
- Adults with learning disabilities
- Benign and malignant head and neck disorders
- Burns
- Critical care, ie tracheostomised and/or ventilated patients
- Elderly
- General medical
- Respiratory disorders
- Neuro-degenerative conditions
- Post-surgical patients i.e. orthopaedic, cardiothoracic, abdominal
- Paediatrics
- Spinal cord injury
- Trauma
- Traumatic brain injury

7.2 Pre-procedure checks

Consent
Procedures for patient consent as outlined in section 12.2.1 should be followed.

Positive patient identification
Prior to commencing each FEES procedure, patient identification should be checked to ensure that the correct patient is receiving the correct instrumental swallow examination. The process for positive patient identification should then be clearly and appropriately documented.

Food preferences
Patient food preferences should be established prior to procedure with any food allergies or intolerances identified and documented. This information should then direct the choice of liquids and foods chosen for FEES evaluation.

8. Safety

SLTs should consider the possible risks of FEES for every patient as the nature of some disorders may preclude safe assessment. The use of a Procedural Safety Checklist should be considered to limit risk (see Appendices).

8.1 High risk and vulnerable patient populations

The rationale for proceeding with an 'at-risk' patient and the risks vs benefits should be documented in the patient record. Failure to do so may constitute a breach of acceptable professional conduct.

Possible contraindications for FEES due to scoping risks include the following:

- Skull base/facial surgery or fracture within the previous six weeks
- Major or life threatening epistaxis within the previous six weeks
- Trauma to nasal cavity secondary to surgery or injury within the previous six weeks
- Sino-nasal and anterior skull base tumours/surgery
- Nasopharyngeal stenosis
- Craniofacial anomalies
- Hereditary haemorrhagic telangiectasia
- Choanal atresia
- Laryngectomy within the previous two weeks

An ENT surgeon should be consulted with these patients prior to proceeding and the timing of FEES discussed if a decision is made to proceed. ENT should be present for the FEES, as these patients present technical scoping challenges and risk of harm. It may be appropriate to consult oral and maxillofacial surgeons in certain cases.

It is suggested that you precede with caution for the following high-risk patients:

- Limited pharyngeal or laryngeal space
- Significant airway limitation due to the presence of large-volume disease, such as cancer
- Severe movement disorders and/or severe agitation
- Vasovagal history
- Bleeding risks - see section 8.2 under Epistaxis
- Patients with positioning limitations

The SLT should consult the appropriate physician prior to proceeding and request their presence if deemed necessary for safe practice.

8.2 Adverse effects and complications

FEES is a safe and well-tolerated procedure when performed by appropriately trained personnel in a safe environment. Taking an accurate case history is essential for predicting risks and the likelihood of encountering complications.

Minor adverse effects

The following minor adverse effects have been reported:

- **Patient discomfort:** Although quite common, discomfort should be mild if the patient is prepared, positioned optimally and nasendoscopy performed competently.

- **Gagging:** This can occur as the nasendoscope passes over the soft palate in the nasopharynx. Some patients have a hypersensitive gag, making scope passage and visualisation difficult. Minimise the time spent with the scope in the palatal region following assessment of velopharyngeal sphincter competence.

- **Vomiting:** This may occur with gagging or from coughing following aspiration. If a patient presents with nausea, then it is wise to postpone the FEES.

Complications

FEES should be performed with care to avoid complications and SLTs should be trained to recognise symptoms and take appropriate action to keep the patient safe. The following may occur:

- **Epistaxis:** Nose bleed due to mucosal trauma during scope insertion. Seek medical consent prior to proceeding with FEES if there is a history of epistaxis. Bleeding risks increase with antiplatelet therapy, thrombolysis and aspirin medications, and with patients on Extra Corporeal Membrane Oxygenation (ECMO) or Ventricular Assistive Devices (VAD). Medical advice should be sought if unsure whether to proceed.

- **Vasovagal response**: A fainting response may occur with high levels of anxiety. Exercise caution if the patient has a history of vasovagal episodes.

- **Reflex syncope:** Fainting may occur as a result of direct vigorous stimulation of the nasal/pharyngeal/laryngeal mucosa; however, stimulation with a nasendoscope during FEES should be minimal. Caution

should be exercised in patients with unstable cardiac status, as reflex syncope would result in further risk (Langmore 2001).

- **Allergy to topical anaesthesia**: Avoid use of anaesthesia for FEES and check known patient allergies (see section 8.6).

- **Laryngospasm:** An uncontrolled or involuntary muscular contraction (spasm) of the vocal folds leading to difficulty breathing and stridor. Laryngospasm can be triggered by aspiration, reflux or nasendoscope contact with the vocal folds. Patients with neurodegenerative diseases, such as Motor Neurone Disease (MND), may be more prone to laryngospasm (Nacci et al 2016). If this occurs, abort the FEES and seek immediate medical assistance.

- **Severe aspiration**: If significant aspiration occurs during FEES, ensure the patient receives physiotherapy support for pulmonary clearance immediately, as required, and inform the medical team and document in the event of clinical chest deterioration later.

8.3 Paediatrics

No adverse effects have been reported in paediatric FEES studies. FEES may even be favoured over VFS in terms of risk benefit, especially in the NICU (Reynolds et al 2016; De Silva et al 2010; Leder 2000). Contact with the larynx and epiglottis should be minimised, to avoid injury to fragile mucosa and owing to higher risks from oedema compared with adults. Ensure that the nasendoscope is of an appropriate size for the child or neonate. (See Paediatric section 11.2 for contraindications).

8.4 Equipment, personnel and environment

8.4.1 Equipment

FEES is safe when performed with the appropriate equipment. A good-quality flexible nasendoscope, light source, camera, and monitor with audio and capacity for live recording of images will all enable clear visualisation and recording of the procedure. Video recording is essential for reliability and constitutes a risk if unavailable. Audio recording is desirable. Consumables should be readily available to minimise scoping duration and oral trials should be tailored for each individual. FEES equipment should be cleaned between patients, in line with local infection control policy.

Suction, oxygen and resuscitation equipment may need to be readily available in case of significant aspiration or respiratory compromise during FEES. If pulse

oximetry is required to monitor the oxygen saturation levels of the individual patient, then this should be available during the FEES procedure.

8.4.2 Personnel

A minimum of two persons is required to safely and effectively carry out FEES: one to perform nasendoscopy and the other to perform the assessing/interpretation role. This usually means two FEES-competent SLTs; but it can also mean one FEES-competent SLT and a practitioner competent in nasendoscopy for FEES. For example, an anaesthetist or ENT surgeon can scope under the direction of the SLT interpreting the FEES.

A Level 3 SLT FEES practitioner can perform FEES endoscopy and interpretation simultaneously if necessary, but this should always be with the assistance of healthcare staff or carer for feeding. However, the reliability of FEES interpretation is optimal with two FEES practitioners rather than one.

A suitably qualified healthcare professional competent in advanced life support, such as a doctor or paramedic, should be readily available within close physical proximity.

A pathway for access to an ENT opinion should be agreed for both developing and established FEES services.

8.5 Environment

FEES should be performed in an appropriate clinical treatment setting, which may mean a hospital ward, a rehabilitation unit or a designated clinic. All environments should be risk-assessed. FEES may also be practised safely in the community in a clinical setting, for example in a hospice, GP surgery, rehabilitation unit or nursing home (see Community section 11.3). All settings for FEES procedures should be position paper-compliant for optimal patient safety.

8.6 Decontamination and infection control

Disease transmission is possible during FEES via contact with equipment contaminated by saliva, blood and other bodily fluids. It is essential that a robust method of effective decontamination is agreed with service commissioners, with appropriate risk assessments documented. Decontamination and storage of clinical equipment should adhere to universal and local trust policies, and to guidelines on infection control and decontamination of nasendoscopes (ENT UK 2017; DoH 2013, 2016).

Appropriate manufacturer-approved decontamination procedures should also be followed. Scope leak testing should be carried out following each procedure and an audit trail maintained. Nasendoscope use should be documented to ensure tracking and traceability, while decontamination should be carried out by trained staff. Nasendoscopes should be utilised within three hours of decontamination unless stored in sterile packaging, and incidents involving errors in decontamination or tracking of scopes should be reported. SLTs are advised to check local infection control guidelines on the appropriate use of ice-chip-making equipment for oral trials.

For invasive endoscopy procedures, it is important to determine whether a patient has definite or probable Transmissible Spongiform Encephalopathies (TSEs), such as vCJD (Variant Creutzfeldt-Jacob Disease), via medical history and patient reports. The outcome should always be documented in the patient record or FEES report. DoH guidance (2013, 2016) stipulates that after a procedure, flexible endoscopes used on patients infected or presumed infected with vCJD should be retained for use on that same patient after conventional decontamination, or destroyed by incineration.

8.7 Anaesthesia and decongestants

Lubrication gel applied to the nasendoscope should be sufficient to ease scope passage, but avoid over-application, which may impair the quality of the view (Conlin et al 2008).

FEES should be performed without anaesthesia as it may compromise sensory aspects of the swallow and increase aspiration risk (Fife et al 2015; Lester et al 2013). There is good evidence that the use of local anaesthesia or a vasoconstrictor is of no value and does not improve the comfort, pain, tolerance, or ease of exam or quality of view, and may cause unpleasant side-effects (Javed et al 2017; Kamrunas et al 2014; Suskaraneni et al 2011; Johnson et al 2003; Frosh et al 1998; Leder 1997; Singh et al 1997). Co-phenylcaine may cause an unpleasant taste and lidocaine may cause more pain (Conlin et al 2008). Lower doses of lidocaine (0.2ml of 4% lidocaine) may improve comfort without impairment to swallowing (O'Dea et al 2015), but it is suggested use be avoided until further evidence emerges.

Local anaesthetic or decongestant may be needed in exceptional cases of poor scope tolerance when FEES is in the patient's best interests and absolutely necessary. The use of topical anaesthesia should be avoided or used with caution in post Myocardial Infarction (MI), or cardiac surgery patients, due to potential cardiac side-effects. Medical or pharmacy opinion should be sought prior to use (NICE BNF 2019) and SLTs should seek local advice from pharmacy medicines management as to whether a Patient Group Direction (PGD) is required for

administration of topical anaesthesia (Medicines Practice Guidelines (MPG2) August 2013 (updated March 2017)). SLTs can do so only as named individuals (Human medicines regulations 2018).

8.8 Use of dye

The use of naturally pale fluids and food may help optimise the contrast against mucosa and secretions during FEES. Drops of green, blue or white food dye may be added to secretions, food and liquid to optimise visualisation and may enhance detection of residue and penetration/aspiration (Marvin et al 2016).

Using different colours for the different fluid and diet texture trials will provide contrast and assist interpretation of residue and airway invasion. However, dyeing secretions is usually unnecessary and may stain the pharynx, compromising further evaluation with oral trials. Adding dye to fluids/foods may also not be necessary (Leder 2005), particularly as digital image endoscopy becomes more commonplace. If used, then a minimum amount (1-2ml) is advised to avoid discolouration of skin (Czop et al 2002) or urine (Carpenito et al 2002; Ehrig et al 1999).

Advice should be sought prior to using food dye in patients with allergy or active conditions that increase gut permeability, such as major vascular surgery, severe burns or renal failure (Maloney et al 2002).The use of methylene blue is never recommended owing to potential adverse effects (Prashant et al 2010).

8.9 Disposal of trial foods and fluids

All foods and fluids used for oral trials should be disposed of appropriately at the end of the procedure in accordance with local infection control policy.

8.10 Incident reporting

Any complications observed during FEES should be reported using local incident reporting systems, and incidents should be logged and audited annually to ensure safe practice.

8.11 Resuscitation

Because of the invasive nature of FEES, SLTs involved in performing the examination must undergo regular basic life support and CPR training. SLTs working in less supported environments, eg community settings or independent practice, should undertake Immediate Life Support (ILS) training annually (National Resuscitation Council).

9. Ethical considerations

In addition to clinical indications and practical considerations, a decision to proceed with FEES should be based on the potential impact of recommendations and outcomes on the patient's quality of life. SLTs should consider FEES in the context of insight, and the patient's desire to eat and drink, capacity, wishes, mood, cooperation, fatigue, distress, comfort, health status and prognosis. The benefits of FEES should outweigh the risks. FEES findings should be interpreted within the wider patient context and contribute to decision-making by the MDT, on matters such as the safety of oral feeding and likelihood of negative health consequences, such as aspiration pneumonia.

9.1 Risk feeding

Risk feeding decisions (when a patient continues to eat and drink despite a significant risk of aspiration or choking) are an integral part of MDT dysphagia management, particularly in palliative and end-of-life care. These may be for quality-of-life reasons or where there is no appropriate option for alternative feeding or nil by mouth (NBM). FEES can be beneficial for establishing more accurately the level of risk or safety of oral feeding and swallow prognosis, assisting the team or patient and carers with risk feeding decisions. FEES-based risk feeding versus clinically assisted nutrition and hydration decisions should follow national guidance and encompass ethical, consent and mental capacity aspects of guidance (BMA 2018; MCA 2016, 2005; RCP 2010; AIA 2000; DoH 2009).

10. Professional boundaries

It is not the role of SLTs to make medical diagnoses. SLTs use FEES to assess structures and functions related to swallowing efficiency and safety, and to determine appropriate feeding strategies. Inevitably though, through the direct visualisation of naso/oro/laryngopharyngeal structures, abnormalities may be observed and ENT opinion should thus be sought to establish a medical diagnosis.

Structural abnormalities observed on FEES may also impact on the upper airway, particularly in head and neck (including laryngectomy), critical care, tracheostomised, or laryngotracheal stenosis patients. SLTs should liaise closely and seek opinion and diagnoses from ENT, the intensivist/anaesthetist, the neurologist and the MDT as appropriate.

11. Additional considerations for specific patient populations

This section describes patients in different settings or with different medical needs, whose specific presentation may require modifications to standard FEES practice. Some of these are areas of emerging speciality and are not currently covered in other RCSLT position papers or policy statements.

11.1 Tracheostomy

Knowledge and skills in tracheostomy management are a prerequisite for performing FEES in this population. Procedure-wise, FEES for a tracheostomised patient should assess the effects of any respiratory support on laryngopharyngeal structures, secretions, sensation and swallow function. Different amounts or modes of ventilatory support, cuff inflation and deflation, ACV, one-way speaking valve use, digital occlusion or capping off may be trialled dependent upon an individual's weaning plan. Procedure steps should be planned and communicated to staff and patients at the start to minimise procedure duration. Nurse and/or physiotherapist assistance is beneficial for suctioning and monitoring of vital signs and respiratory status during FEES.

National guidelines and studies recommend early referral of all tracheostomised patients to speech and language therapy and the importance of FEES for detection and management of dysphagia in this population (GPICS V2 2019; NCEPOD 2014; McGrath & Wallace 2014; McGrath 2014; NTSP manual). FEES can result in earlier introduction of oral intake, can influence tracheostomy/ventilator weaning decisions and, by detecting silent aspiration, may prevent respiratory complications delaying weaning. Accurate assessment of the impact of laryngeal injury, supraglottic and glottic closure abnormalities, intubation trauma and critical illness-acquired weakness on swallowing and weaning are crucial to speech and language therapy and MDT management of critical care patients (Ng et al 2019; GPICS V2 2019; Wallace 2013).

The benefits of early and sequential FEES include: the ability to deliver prescriptive advice, targeted dysphagia therapy, monitoring of both the tolerance of oral trials and the contribution of possible aspiration to respiratory set-backs, and assessing the effect of interventions, ie steroids for laryngeal oedema, pharmacological agents, botulinum neurotoxin for secretion reduction, ACV, cuff deflation and one-way valves. Extra vigilance may be indicated if medical or respiratory status is unstable. Extra infection control precautions and personal protective equipment, such as face masks or eye protection, may be needed.

11.2 Paediatrics

As this is an emerging area in the UK, there is limited guidance available in this patient population. However, FEES is a safe and effective instrumental assessment for use in paediatrics and specifically with neonates (Vetter-Laracy et al 2018; Grammantiatis et al 2018; Reynolds et al 2016; Suterwala et al 2017). SLTs performing FEES should have undertaken specialist training, by an endoscopist competent to train in paediatric nasendoscopy, and be competent in the management of dysphagia in paediatrics (and neonates, if using FEES with this very young population). Careful discussion should take place with the MDT and parent/guardian regarding the potential risks versus benefits of each FEES before proceeding. This assessment should be performed only within a hospital setting.

Clinical indications may include:

- Signs of aspiration during bottle, breastfeeding and/or during clinical feeding assessment
- Feeding strategies exhausted
- Ongoing difficulties with secretion management
- Ongoing feeding difficulties associated with upper airway obstruction and/or long-term need for respiratory support. These may include fatigue, stridor and/or changes to respiration during and after feeding
- High-risk infants with suspected laryngeal abnormality, eg vocal cord palsy post-cardiac surgery
- Abnormal VFS requiring further investigation and information regarding anatomy and swallow function
- Instrumental assessment required but infant too medically fragile to be transported to radiology.

Possible contraindications due to scoping risks include:

- Previous difficulty or failure to pass a nasogastric tube or scope
- Anatomical conditions such as choanal atresia/stenosis, nasal or pharyngeal stenosis, or piriform aperture stenosis
- Craniofacial trauma or abnormalities.

With these patients, an ENT surgeon should be consulted and be present for the FEES.

The use of FEES should be cautiously considered if any of the following apply:

- Autonomic instability
- Less than 37/40 gestation age
- Not at cue-based feeding stage of feeding readiness

In these cases, the purpose of the FEES would primarily be to evaluate excessive secretions and risk of aspiration of secretions.

Additional considerations:

- Smaller-diameter endoscopy equipment (need 2.6mm for infants) is required for scope passage and evaluation of smaller anatomy. Neonatal or paediatric flexible nasendoscopes must be available
- Parental or guardian consent is required
- Neurobehavioral neonatal strategies/play therapy may be needed to prepare the infant/child for the procedure and ensure cooperation with scope insertion
- Positioning in the arm or lap of the parent/guardian, or in the typical feeding position if breast- or bottle-fed. Use of a neonatal therapist (SLT/OT) to help calm and maintain an alert and calm state
- Aim to replicate the child's typical feeding/eating and drinking set-up, eg positioning, utensils, food
- Use of drops of sucrose during non-nutritive sucking (NNS) with babies who are breast-/bottle-feeding.

11.3 Adult FEES in community

For the purposes of this position paper, community settings refer to:

- community hospitals
- health centres
- nursing homes
- GP surgeries
- hospices and
- rehabilitation facilities.

FEES within a patient's home are **not** recommended.

There is limited research on the use of FEES in the community. The possible benefits include reductions in hospital admissions, less reliance on nutritional supplementation and increased access to instrumental assessment for less mobile patients. A community FEES service has the potential to improve equity of care and quality of dysphagia management.

Risk assessment

SLTs performing FEES in the community should risk-assess each individual procedure, including: factors relating to the medical history, comorbidities, overall presentation, dysphagia severity, current oral intake and the proposed setting. Increased risk occurs with prolonged NBM status, high risk of aspiration of both secretions and oral intake, compromised respiratory status, respiratory support, known risk of laryngospasm or epistaxis (see section 8). These patients may not be suitable for community FEES but should be considered for assessment in a hospital setting.

GPs should be informed of the intent to conduct a FEES, and any contraindications checked and ruled out by the SLT in discussion with the GP. Vital signs such as respiratory rate, blood pressure and heart rate may be monitored as appropriate.

Additional considerations:

- FEES should be performed in the hospital setting or in a clinic with ENT instead of in the community if there are specific concerns around risk, safety and clinical stability
- A low threshold for abandoning the procedure should be applied
- Community services must have a local agreement regarding access to ENT for diagnosis of anatomical abnormalities detected on FEES
- A community 'grab bag' should be available, including an Automated External Defibrillator (AED), bag and mask ventilation, an oropharyngeal airway and a nasopharyngeal airway.
- Access to a telephone to call emergency services (999) should be available in the room where the procedure is performed.
- A minimum of two clinicians trained in ILS should be present for the procedure in order to support the effective implementation of life support.
- In the event of a life-threatening emergency, staff should call for additional support from other professionals working in the environment (e.g. doctors, nurses, HCAs)
- Significant barriers exist in the safe procurement, storage and transport of oxygen. In settings where oxygen is routinely available, eg GP surgeries or where a patient has oxygen prescribed, it should be accessible for use. In other settings, eg nursing homes, FEES may be undertaken without access to oxygen, but increased caution should be taken during the assessment and a low threshold for abandoning the procedure applied
- Local clinical waste disposal and infection control policies should be followed
- A portable pulse oximeter should be available for use if indicated

- Additional health and safety hazards in the immediate clinical area should be mitigated against, such as trip hazards and ensuring pets are kept outside the room.

11.4 Laryngectomy

In contrast with other dysphagic populations, there is limited data on the nature of swallow symptomatology post-laryngectomy, or on the best evaluation tool for optimum management in this population. FEES has been used extensively to evaluate swallowing in the head and neck cancer population (Deutschman et al 2013; Teguh et al 2008; Rosenthal et al 2006; Hiss & GN Postma 2003; Leder et al 2001; Langmore et al 1998) although the procedure has been less well established post-laryngectomy. Knowledge and skills in laryngectomy management are a prerequisite for performing FEES in this population.

Recent evidence (Coffey et al 2018a) supports the use of FEES post-laryngectomy in visualising the neopharynx, voice prosthesis and oesophagus. FEES post-laryngectomy may contribute to the visualisation of features such as the degree of residue on the voice prosthesis and within the oesophagus. The oesophageal flange of a voice prosthesis is typically sited within the upper oesophagus. Therefore, endoscopy post-laryngectomy may be beneficial for problem-solving voice prosthesis issues (Pilsworth et al 2011) and for discerning the impact of different prostheses on swallow function (Coffey et al 2018b). Appropriately trained SLTs can therefore evaluate the potential effect of voice prosthesis on swallow function by advancing the nasendoscope to the upper oesophageal region.

11.5 Laryngotracheal stenosis

Laryngotracheal stenosis is a narrowing of the airway at any point between the supraglottis and carina (Clunie et al 2017), usually as a result of tracheal intubation, tracheostomy and laryngeal trauma (Lennon et al 2016). Surgical interventions to treat laryngotracheal stenosis range from endoscopic techniques to major open airway surgery, including reconstruction with cartilage grafts or resection of severely stenotic segments. In some cases, stents may be used to maintain the expanded airway post-surgery. Patients may experience voice and swallowing difficulties before, during and after reconstruction surgery (Clunie et al 2017), and patients with stents may experience a longer duration of dysphagia symptoms than those without (Lennon et al 2016).

Sequential FEES by appropriately trained SLTs facilitates repeat evaluations without the need for recurrent radiation exposure (Braun et al 2018; Farnetti 2014; Leder 1998) and is beneficial for observing altered anatomy and swallow function pre- and post-surgery and, if appropriate, following stent removal (Clunie

et al 2017). Knowledge and skills in the management of patients with laryngotracheal stenosis are a prerequisite for performing FEES in this population.

11.6 Mechanical Insufflation-Exsufflation (MI-E) under visualisation in neuromuscular disease: MI-E FEES

Knowledge and skills in the management of patients with respiratory, neuromuscular or neurodegenerative diseases are a prerequisite for performing FEES in this population.

Mechanical insufflation-exsufflation (MI-E) utilises a 'CoughAssist' device to aid airway and secretion clearance which can help to reduce respiratory infections in patients with neuromuscular disease (Morrow 2013; Homnick 2011). However, MI-E often fails in those patients with bulbar impairment, such as in MND or myotonic dystrophy, presenting a difficult clinical challenge. FEES has been shown to be a feasible method for visualisation of the upper-airway, secretions and laryngeal response during MI-E (Andersen et al 2016). These can be assessed in addition to the usual functional swallowing assessment.

A small number of laryngeal imaging studies have shown that MI-E failure may be due to provocation of significant glottic adduction through both the inspiratory and the expiratory pressure cycles. Hypopharyngeal constriction, particularly during exsufflation, can significantly compromise the size of the laryngeal inlet and lead to patient intolerance of MI-E (Allen 2018). Use of FEES to visualise the effects of different MI-E settings on laryngopharyngeal structures and pooled secretions can facilitate customisation of 'CoughAssist', which in turn improves compliance and effectiveness, extending MI-E use. As MI-E FEES is carried out in collaboration with physiotherapy or respiratory colleagues, it enhances the multidisciplinary assessment and management of neuromuscular patients. Modifications are needed to the 'CoughAssist' technique, such as adapting face masks to enable scoping and systematic recording of MI-E trial settings during the MI-E FEES. SLTs should be prepared to manage the range of possible outcomes associated with these complex neuromuscular/neurodegenerative patients, including provocation of stridor or laryngospasm under MI-E.

Patients showing signs of ILO should be referred to the appropriate respiratory service for further MDT investigation where appropriate (see RCSLT Respiratory Position Paper, 2015).

11.7 Prolonged Disorders of Consciousness (PDoC)

Evidence shows that FEES is safe to use with PDoC patients (Brady et al 2009; Hales et al 2008). Clinical swallow assessment is limited by the profound cognitive

and communication impairments experienced by these patients; therefore FEES can offer a more thorough assessment. Because of inability to give consent, PDoC patients should be referred for FEES only if it is deemed, by the treating team and family, to be in their best interests after consideration of the ethical, medical and legal implications.

Some patients may be able to demonstrate behaviours that indicate a level of awareness in the context of oral trials, which are not seen otherwise. The use of FEES can indicate safety of extending or continuing oral trials. There are ethical considerations when introducing oral intake to this population, and SLTs should consult the Clinically-Assisted Nutrition and Hydration guidelines (BMA CANH 2018) and Guidelines for SLTs Working with Adults in Disorders of Consciousness (Royal Hospital for Neuro-disability (RHN) 2019).

FEES can also be used to assess saliva management: a key area of concern for these patients (Royal College of Physicians 2013). Assessment of saliva management using FEES can guide tracheostomy weaning, which is often complex in these cases. Decannulation can reduce carer burden and may allow the patient to be placed closer to family long-term.

SLTs carrying out FEES for these patients should ideally have knowledge and experience of managing this client group, or should consult with those who do, in order to adapt the procedure and recommendations appropriately. The RHN 2019 Guidelines provide a list of highly specialist SLTs who are able to provide advice.

12. Clinical governance

12.1 Patient and carer information

It is good practice to provide online, verbal and, where possible, written information about the FEES procedure and possible effects prior to the examination. An information leaflet and an aphasia-friendly version should be available and access to an interpreter arranged for the procedure, if required (see Appendices).

12.2 Legal framework

12.2.1 Consent

Consent should be informed, specific, unambiguous, given freely and involve clear affirmative action (GDPR 2018). When a decision for FEES is made, it should be explained that FEES is a minimally invasive procedure carrying low risk, and informed verbal consent should be obtained. The SLT performing FEES should ensure that consent is still valid before the examination begins (DoH 2009). Consent procedures should be in accordance with local and/or best practice guidelines.

Where the patient is deemed to lack mental capacity to give or withhold informed consent, proceeding with FEES may still be appropriate, if considered clinically necessary and in the patient's best interests. Decisions are governed by legislation and should be taken under advice and within the context of the MDT (Mental Capacity Act Northern Ireland 2016; DoH 2009; Mental Capacity Act England & Wales 2005; Incapacity Act Scotland 2000).

A FEES procedure should be aborted at the point at which a patient indicates a withdrawal of consent or refusal, ie pulling out the nasendoscope. Consent for FEES should be sought from a parent/guardian for children under the age of 16. Children under 16 can consent to their own treatment if they are considered to be Gillick competent.

Consent should be obtained for any visual or audio FEES recordings, including photographs, and the purpose and possible future use must be clearly explained before written consent is sought for the recording. If recordings are to be used for teaching, audit or research, patients must be aware that they can refuse without their care being compromised and that they can be anonymised (DoH 2009). Sensitive health data, including photographs should be processed confidentially according to local and national guidelines and data protection legislation (Data Protection Act 2018).

12.2.2 Duty and standards of care

The SLT has a duty of care to reduce harm and to share FEES patient data with other healthcare professionals to ensure safe and effective treatment (Health & Social Care Safety and Quality Act 2015). SLTs should ensure that they apply the recommended standards of care to all FEES activity. This includes: working within the limits of their FEES and dysphagia knowledge and skills, managing risk, reporting safety concerns, promoting and protecting the interests of patients, respecting confidentiality, communicating appropriately and keeping accurate records (HCPC Standards of conduct, performance and ethics 2016).

12.3 Rating and reporting

At the end of the FEES procedure, the recording should be reviewed and rated, results discussed, recommendations agreed by the two practitioners and findings communicated to the patient, carer and MDT. The exception to this would be when the examination is performed by a level 3 practitioner performing the FEES independently. Slow motion review capability is important for accuracy of interpretation, and rating scales are recommended for: assessment of secretions, airway protection, penetration/aspiration and residue (Miles et al 2018; Neubauer et al 2015; Langmore 2001; Murray et al 1999; Rosenbek et al 1996) (see Appendices for suggested rating scales). Ratings scales enhance the reliability of FEES, but owing to their limitations these should also be accompanied by descriptive interpretation.

Standard detailed FEES reports, including images, are recommended for consistent reporting and should be available to the MDT, where possible (see example in Appendices). Reporting and documentation should be carried out contemporaneously and findings documented within the medical notes. Reports should be completed in a timely manner. Any complications should be documented and communicated with relevant medical staff.

12.4 Audit

FEES outcomes should be audited for clinical efficacy and/or impact on the quality, safety and cost of patient care. This will provide vital information on the added value of speech and language therapy intervention (see Appendices). Quality improvement frameworks can be used to support the further development of FEES and dysphagia services. FEES data may be shared with other SLTs and professionals through networks in order to support the wider establishment of FEES services. Safety should be monitored through regular audit of adverse effects, and changes made to practice to reduce risks, if these are occurring more frequently than reported in the literature (see section 8.2).

12.5 Research

There is still wide scope for research in FEES, and SLTs should be encouraged to develop clinically relevant projects, which drive the FEES and dysphagia evidence forward and expand FEES practice. Collaborative research is encouraged to explore the increasingly complex nature of dysphagia disorders and to improve awareness among other professionals of the benefits of FEES. More studies involving patient/service user experience, quality of care improvements, and specialist populations would be beneficial.

13. Training and competency

FEES is an invasive procedure that carries some risks to the patient and in order to perform FEES independently, SLTs must undertake appropriate training. Assessment and validation of competence is required, and should be carried out by a level 2B or level 3 FEES practitioner. This is because of an inability for professionals to accurately self-rate their competence levels, with lower-skilled medical staff rating themselves erroneously as competent (Benadom et al 2011; Davis et al 2006; Hodges et al 2001).

SLTs trained overseas in FEES but practising within the UK must ensure they meet RCSLT requirements for competent FEES practice. Approval to perform FEES should be given by the SLT's Trust, employer and manager with recognition of competence, and must be documented in their job description.

13.1 Verification of competency attained

Endoscopy competency will be verified by a competent endoscopist and assessing clinician competencies will be verified by an experienced level 2B or level 3 FEES clinician. Competency verification may be from a supervisor outside the trainee's own department or Trust, and the named supervisor should be available after verification, for support while transitioning to independent FEES practice.

13.2 Maintenance of competencies and returnees to work

SLTs are responsible for maintaining their competency to perform FEES and to ensure the prerequisites for practice are in place. This should involve regular practice of a minimum of 12 FEES per year, but if it is insufficient for competence, the practitioner should seek more. Engaging in re-orientation to practice, peer review activities, observation, joint interpretation and rating of FEES recordings, and undertaking FEES are also recommended.

If FEES practice is sporadic or developing, the SLT should maintain a FEES log. There is an individual professional responsibility to review competency if FEES has not been performed for one year. If an SLT is returning to practice after an extended break (12 months or longer) competencies should be checked and signed off by a FEES-competent supervisor (internal or external to the Trust).

13.3 Knowledge and skills

13.3.1 SLTs Referring for FEES

SLTs working in dysphagia who refer for FEES examinations, but are not undertaking FEES competency training, require knowledge of:

1. Purpose of FEES
2. Appropriate patient selection for FEES and VFS
3. Clinical indications and outcomes
4. Safety – high-risk and vulnerable patient populations
5. Adverse effects and complications
6. Local referral procedure and FEES service logistics.

13.3.2 SLTs undertaking FEES training

Core competencies and expertise in dysphagia underpin the knowledge and skills required to perform FEES. SLTs are professionally responsible for achieving the appropriate level of training to perform FEES competently.

Core prerequisite knowledge and skills for the assessing clinician are:

1. Level C - Dysphagia 'Highly Specialist' Level (RCSLT Dysphagia Training and Competency Framework, 2014)
2. Experienced in working independently with dysphagic patients
3. Advanced, comprehensive clinical knowledge of normal and disordered anatomy, physiology and neurology of swallowing, including swallowing changes over the lifespan
4. In-depth understanding of interaction between respiration, airway protection and swallowing
5. Knowledge of the FEES evidence base
6. An expert level of dysphagia competence and skills in the relevant patient population undergoing FEES
7. 'FEES referrer' requirements met (see section 13.3.1)
8. Current and regularly updated dysphagia knowledge.

VFS background knowledge and skill requirements

Ideally, SLTs undertaking FEES training should be competent in VFS in order to fully appreciate the indications, contraindications, benefits and limitations of both instrumental tools. This influences appropriate referral and safety, and drives patient access to instrumental assessment based on clinical factors. It also facilitates a comprehensive training and practice approach for SLTs.

If competence in VFS is not achieved prior to undertaking FEES training, ensure **one OR more** of the following are achieved as a minimum:

- Observation and joint rating of a minimum of **five** live VFS procedures carried out by an SLT competent in VFS. The majority of these examinations should be performed on patients within the trainee's clinical specialty
- Completion of MBSImP certification
- Independent accurate rating of **five** previously recorded VFS examinations agreed with an SLT competent in VFS.

13.4 Knowledge required to perform FEES

1. Evidence base for FEES including within the SLT's specialist clinical population
2. Appropriate patient selection, considering safety, risks and benefits
3. Anatomical landmarks and abnormalities viewed endoscopically
4. Altered anatomy/physiology and possible impact on swallowing function
5. Elements of a comprehensive FEES examination and tailoring to the individual's needs
6. Rating scales, how to apply them and detailed reporting
7. Underpinning knowledge of the appropriate application of treatment interventions, ie postures, safe swallowing strategies, manoeuvres, bolus modification, environment and positioning, etc.
8. Dysphagia aetiology, symptoms and their significance and severity
9. Interpretation of FEES findings within the context of medical and dysphagia history, previous swallowing assessments, severity and prognostication
10. Sufficient knowledge to ensure appropriate dysphagia management recommendations
11. Appropriate referral for ENT opinion when anatomical variation is detected, including suspicion of pathology
12. Appropriate referral to another professional, eg neurology, other expert SLTs
13. Appropriate timing, rationale and nature of future FEES, VFS or clinical bedside review
14. Sufficient knowledge to enable clear, empathic explanations of FEES findings to patients, families and other professionals, for teaching and improved participation.

13.5 Skills required to perform FEES

The endoscopist (SLT)

1. Operation, maintenance and disinfection of the FEES equipment
2. Insertion and manipulation of the nasendoscope in a manner that minimises discomfort and risk and optimises a successful view of the laryngopharynx
3. Insertion and manipulation of the nasendoscope around obstacles such as nasogastric tubes, nasal cannulae and non-invasive (NIV) nasal bungs
4. Effective communication with FEES colleague pre-, during and post-procedure
5. Monitoring patient comfort and safety throughout, minimising the duration of the procedure and discontinuing if indicated
6. Application of topical anaesthetic/decongestant, if necessary
7. Checking for and managing any infection risks.

The assessing clinician (SLT)

1. Effective communication with the patient and carer, supporting, guiding and coordinating the assessment
2. Effective communication with the endoscopist, directing them if needed to achieve the optimal view
3. Clear and effective review of the rationale and appropriateness for FEES, and any risks. Includes checking the case history, the environment, current patient status and consulting medical opinion as needed
4. Monitoring the patient's comfort and safety throughout, minimising the duration of the procedure and discontinuing if indicated
5. Accurate and detailed interpretation of findings with appropriate planning
6. Effective communication and clear documentation of recommendations and plan for the MDT, patient and carers.

13.6 Methods of acquisition of the knowledge and skills

Competence in FEES may be acquired using a range of learning methods (Robinson & Dennick 2015), which must be based on the requirements set out in this RCSLT position paper. These may include:

- Didactic/classroom teaching
- Literature review and critical appraisal
- E-learning
- Simulation training for nasendoscopy
- Attendance at established FEES clinics
- Peer review of clinical practice
- Practice interpretation of previously-recorded FEES examinations

- Supervised clinical experience, including observation and guided practice
- Journal clubs
- Attendance at ENT clinics for nasendoscopy practice
- Mentoring by suitably trained and experienced practitioner
- Attendance at relevant courses and conferences.

13.7 Training structure

Listed below are the minimum requirements for the SLT to achieve competency, with separate competencies for the distinct roles of endoscopist and assessing clinician. If the SLT aims to become competent in both roles, both sets of competencies need to be completed.

It is the professional responsibility of the individual to recognise when further training is required. The actual number of procedures required to achieve competency may be significantly more than the minimum specified in this document. Competency will be reviewed with the supervisor on a continual basis during training in accordance with the needs, job requirements, clinical setting and specialty. It is the trainee's responsibility to ensure that some procedures are carried out within their own area of clinical specialty.

13.8 Endoscopy performed by an SLT

These are the **minimum** requirements for competency. More procedures may be required by some trainees or for practitioners in specialist areas. For endoscopy in paediatrics and neonates, attendance at a specialist training course is advised.

1. Observation of a minimum of **two** nasendoscopy procedures performed on patients by a competent endoscopist
2. Successful safe passage of the nasendoscope into the pharynx a minimum of **five** times on patients or volunteers, under the direct supervision of a competent endoscopist
3. Successfully performs nasendoscopy for the purposes of FEES **10** times, on patients, under the direct supervision of a competent endoscopist
4. Successfully performs nasendoscopy **independently** for the purpose of FEES as judged by a competent endoscopist (level 2B/level 3 SLT or ENT). In order to meet this, the number of FEES examinations judged as competent may vary between trainees
5. Follows local infection control policies and practice regarding nasendoscopes, FEES stack cleaning, personal protection and infection precautions
6. If required, administering topical anaesthetic/nasal decongestant.

13.9 The assessing clinician (SLT)

1. Observation of **five** FEES examinations carried out on patients by a FEES-competent SLT
2. Independent accurate rating of **five** previously recorded FEES examinations on patients with a FEES-competent SLT
3. Performing interpretation of a **minimum of 10** FEES procedures on patients under the direct supervision of a FEES competent SLT
4. Successful and consistent interpretation of FEES examinations **independently**, as judged by a FEES competent SLT. In order to meet this, the number of FEES examinations judged as competent may vary between trainees
5. Completion of the competency checklist with sign-off by the named supervisor.

Training schedules must be logged and signed by the supervising endoscopist and the trainee.

13.10 Levels of competency and expertise for the SLT endoscopist

SLTs can perform endoscopy independently for FEES once competencies have been completed. The SLT endoscopist should seek supervision and support from a level 3 FEES SLT (endoscopist) or a medical practitioner when performing FEES on complex cases.

Complex cases may include patients with severe or complex dysphagia or those who are high-risk patients for whom an ENT surgeon may be required to perform the endoscopy. Determining whether a case is 'complex' will be guided in part by whether it is outside the SLT's usual clinical caseload, level or field of expertise. Clinical examples of complex cases may include patients who are ventilator-dependent, tracheostomised, those with severe respiratory compromise or who have highly disordered anatomy. This list is non-exhaustive (see section 9.1).

13.11 Levels of competency and expertise for the assessing clinician

SLTs progress through the following levels of competency. The number of examinations required for each level is not cumulative:

13.11.1 Level 1

- FEES referrer competencies achieved

- Prerequisite knowledge and skills achieved
- Undergoing FEES training.

13.11.2 Level 2

Level 2A

- Completed all level 1 knowledge, skills and competencies and judged competent to perform non-complex FEES independently
- Performs FEES on complex cases with supervision from a level 3 clinician.

Level 2B

- An SLT who has completed 50 FEES examinations in addition to completion of training at level 2A, can supervise and train level 1 SLTs in non-complex cases (both assessor and endoscopist roles). The 50 examinations should ideally include a balance of performing both endoscopist and assessor roles.

13.11.3 Level 3

- Completed all level 1, 2A and 2B knowledge, skills and competencies.
- Expert practitioner. Level C 'Highly Specialist' or Level D 'Consultant' (RCSLT Dysphagia Training and Competency Framework)
- Can supervise and train others independently, including in the management of complex cases.
- Can perform FEES interpretation and endoscopy for FEES simultaneously (only if trained and highly experienced in performing endoscopy for FEES and always with the assistance of a nurse or other healthcare practitioner).
- Achieved a minimum of 150 FEES examinations achieved at level 2B. This should include a balance of both performing Endoscopist and Assessor roles.
- Performs FEES on complex cases independently.

In order to maintain competency, regular practice is required.

Separate additional competencies are required for specific patient populations such as: critical care, head and neck, laryngectomy, laryngotracheal stenosis and paediatrics, and are detailed in the competency framework.

Official statement

This document is the RCSLT's official statement of professional practice for SLTs using FEES. Adherence to its content and recommendations are the professional responsibility of the individual therapist. Proof of adherence to this will be required should a malpractice claim be brought. Failure to comply with the details of this position paper may amount to a breach of acceptable professional conduct.

RCSLT acknowledges that professional practice continues to grow and develop. Members should contact RCSLT for advice about any areas of practice development relevant to this policy.

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