Fibreoptic Endoscopic Evaluation of Swallowing (FEES): The role of speech and language therapy

POLICY STATEMENT

Royal College of Speech and Language Therapists

Acknowledgements

This is the revised and updated policy statement for Fibreoptic Endoscopic Evaluation of Swallowing (FEES). An expert panel convened by The Royal College of Speech and Language Therapists in September 2004 wrote and revised this policy statement. The panel members were:

Annette Kelly, University College London Hospitals NHS Foundation Trust
Kirsty Hydes, St John's Hospital NHS Lothian
Carolee McLaughlin, Belfast City Hospital, Belfast Trust
Sarah Wallace, University Hospital of South Manchester NHS Foundation Trust

Three ear, nose and throat surgeons acted as policy advisers on the original document. These advisers were:
Mr Khalid Ghufoor, Barts and the Royal London Hospitals
Mr Sim Lew-Gor, The Royal National Throat, Nose and Ear Hospital
Mr Guri Sandhu, Charing Cross Hospital

This policy is the result of extensive consultation with specialist SLTs (dysphagia) and many other colleagues. The authors would like to acknowledge the contribution of dysphagia special interest groups (SIGs) and RCSLT dysphagia advisors.

RCSLT are also grateful to the American Speech and Hearing Association (ASHA)(29) and authors of the RCSLT Policy Statement "Speech and Language Therapy Endoscopy for Voice Disordered Patients" for their generosity in allowing incorporation of sections of their own guidelines within this document.

Reference this document as:

Kelly A.M., Hydes K., McLaughlin C. and Wallace S. Fibreoptic Endoscopic Evaluation of Swallowing (FEES): The role of speech and language therapy. RCSLT Policy Statement 2007

Contents

Page

Position Statement………………………………………………………… 4

Section 1.
Context

1.1 Background and Evidence Base…………………………… 5
1.2 Purpose of FEES……………………………………………….6
1.3 Suitability of FEES: patient groups and contraindications….7
1.4 Multidisciplinary Context………………………………….. 8
1.5 Instrumental Evaluation……………………………………. 8
1.6 Local arrangements…………………………………………….8
1.7 Facilities and equipment……………………………………..8
1.8 Different types of FEES clinics…………………………… 9

Section 2
Training and Competency

2.1 Knowledge and skills………………………………………. 10
2.2 Methods of acquisition of the knowledge and skills…………12
2.3 Training structure………………………………………………12
2.4 Level of competency and expertise…………………………..13
2.5 Verification of competency attained…………………………15
2.6 Maintenance of competencies………………………………..15

Section 3
Procedural Issues

3.1 The FEES procedure……………….…………………………..16
3.2 Health and safety………………………………………………16
3.3 Patient and carer information………………………………..19
3.4 Consent…………………………………………………………19
3.5 Documentation……………………………………………… 20
3.6 Audit……………………………………………………………20

Section 4
Medico-legal Issues ………………………………………………………...21

References

Appendices

Position Statement

Fibreoptic Endoscopic Evaluation of Swallowing (FEES) is defined as an endoscopic examination of the pharyngeal stage of swallowing(1). It incorporates assessment of laryngopharyngeal anatomy and physiology as it relates to swallowing, assessment of swallowing function (saliva and food/fluid) and intervention to determine which postural and behavioural strategies facilitate safer and more efficient swallowing(1). An extended form of FEES (known as FEESST) incorporates sensory testing(2).

It is the position of the RCSLT that FEES and FEESST are within the scope of practice for Speech and Language Therapists (SLTs) with expertise and specialist training in dysphagia.

Medical practitioners are the only professionals qualified to make medical diagnoses related to the identification of laryngopharyngeal pathology.

The practice of speech and language therapy is dynamic and changing. The scope of practice grows along with advances in technology enabling practitioners to provide new and improved methods of diagnosis and treatment. By identifying FEES as within the scope of practice, it is not intended to limit any other new or emerging areas from being developed by SLTs to help improve diagnosis and treatment of swallowing disorders. If practitioners choose to perform these procedures, indicators should be developed to continuously monitor and evaluate the appropriateness, efficacy and safety of the procedure conducted.

This policy statement encompasses the following: background and evidence base, training and competencies, procedure and interpretation, health and safety, types of clinics, medico-legal aspects, patient populations and documentation.

Issues specifically related to the use of FEESST (including training and competencies) are not included within this policy.

Section 1

Context

1.1 Background and evidence-base

FEES is a recognised tool for the assessment and management of swallowing disorders. It has been carried out by SLTs since its inception and description by Susan E. Langmore in 1988(3). It involves the trans-nasal insertion of a fibreoptic nasendoscope to the level of the oropharynx/hypopharynx to evaluate laryngopharyngeal physiology, management of secretions and the ability to swallow food and fluids. *See Appendix A for FEES protocol.*

Since its initial description, FEES has been extended to incorporate testing of laryngopharyngeal sensory function in a technique described as FEESST(2).

Both FEES and FEESST are safe procedures with a reported low incidence of complications(1, 4, 5). A number of studies have reported that FEES is a valid tool for detecting aspiration, penetration and pharyngeal residue when compared with videofluoroscopy(6-11). Other studies have commented on the benefits of using FEES across the spectrum of clinical populations including paediatrics(12), stroke(13), traumatic brain injury(14), critical care(15) and head and neck cancer(16).

The majority of the published evidence related to FEES is level 4 or 5, with a small number of level 2 and 3 publications. There is a need for level 1 and 2 evidence to support the use of FEES. However the challenges of carrying out this level of research are recognised. The lack of clinicians and raters with the required expertise to rate FEES examinations for research purposes presents the most significant challenge.

The practical and clinical applications of FEES will be discussed in section 1.3.

1.1.1 Reliability of interpretation of FEES images

There is limited literature examining reliability of FEES. There are multiple factors that may affect the reliability of FEES interpretation including;

- The lack of validated and standardised rating scales and terminology

- Variable image quality due to equipment, experience of endoscopist and patient variables
- Lack of clinical information
- Level of experience of the assessing clinician

A number of studies have indicated that FEES has good intra- and inter-rater reliability, although a limited number of parameters were evaluated(9, 10, 17, 18).

1.1.2 The availability of a range of instrumental swallowing assessments provides the most clinically effective service for patients, enabling selection of examination on the basis of clinical indications. *(see Appendix B).*

1.2 Purpose of FEES

The indications for FEES may include(1, 19):

- Assessing secretion management
- Assessing patients at high risk of aspiration (unsafe for food trials)
- Visualising laryngopharyngeal structures
- Assessing laryngopharyngeal sensation
- Biofeedback/teaching
- Assessing swallow fatigue over time
- Assessing swallowing of specific foods
- Assessing patients who cannot undergo videofluoroscopy (due to immobility, equipment or medical instability)
- Repeated assessment

The outcomes of endoscopic assessment may include evaluation of:

- anatomy and swallow physiology
- secretion management and sensation
- airway protection as it relates to swallowing function
- swallowing of foods/fluids

- postures, strategies and manoeuvres
- optimum delivery of bolus consistencies and sizes
- therapeutic techniques

(See Appendix B for a detailed description of the indications for FEES)

1.3 Suitability of FEES- patient groups and contraindications

FEES may be suitable for use with the following dysphagic patient groups. This list is non-exhaustive.

- Acquired neurological disorders
- Traumatic brain injury
- Benign and malignant head and neck disorders
- Critical care i.e. tracheostomized and/or ventilated patients
- Respiratory disorders
- Spinally injured
- Neuro-degenerative
- Burns and trauma
- Paediatrics (with appropriately-sized nasendoscope)
- General medical
- Elderly

Caution should be exercised with the following patient groups as the nature of their disorder may preclude safe assessment. The suitability and safety of FEES should be assessed on an individual basis by the medical team. We recommend that an ENT surgeon is present when FEES is performed on high-risk patients, including the following:

- Severe movement disorders and/or severe agitation
- Base of skull/facial fracture
- Recent history of severe/life-threatening epistaxis
- Sino-nasal and anterior skull base tumours/surgery
- Nasopharyngeal stenosis

This is a non-exhaustive list.

1.4 Multidisciplinary context

FEES should be performed as part of a multidisciplinary team approach to dysphagia management.

The physician or surgeon overseeing the patient's care should be made aware of the intention to perform FEES. A medical practitioner may or may not be present during the FEES examination. However, a doctor must be within easy access (i.e. in the same building) to provide emergency medical backup should a complication arise (see section 3.2 Health and Safety).

1.5 Instrumental evaluation

As with any instrumental evaluation, FEES should be preceded by clinical swallowing evaluation(20).

FEES should not be considered a replacement for videofluoroscopy or any other instrumental dysphagia evaluation. The choice of instrumental assessment should be guided by clinical indications, rather than by available resources (including cost, equipment and competent clinical staff). *(See Appendix B)*

1.6 Local arrangements

The SLT must ensure that approval has been given by their employer and manager with recognition of competence to perform the procedure (see section 2.0). Use of FEES must be written in to the SLT's individual job description. It is good practice to inform other colleagues (i.e. referrers) as appropriate.

In order to obtain full clinical privileges to perform FEES independently the SLT clinician must have undertaken the appropriate training as set out in this policy statement.

1.7 Facilities and equipment

FEES is a safe assessment of swallowing when performed with the appropriate equipment. It is essential that the procedure is recorded (either on video or digitally) and documented. A good-quality flexible nasendoscope, light source, camera and monitor will enable clear and effective illumination of the laryngopharynx.

(See Appendix C)

1.8 Different types of FEES clinics

FEES is a portable and accessible assessment tool. It can be performed in a range of settings, including at bedside, on the intensive care unit or in a designated clinic room. The philosophy of effective team working should be applied to any FEES clinic. A minimum of two persons is required to safely and effectively carry out the procedure. This may involve two speech and language therapists (where one acts as the endoscopist) or one SLT and a doctor competent in nasendoscopy. There are three levels of clinical FEES practice (see section 2.4)

Section 2

Training and competency

2.1 Knowledge and skills

Underpinning the knowledge and skills required to perform FEES, the speech and language therapist will have achieved core competencies in dysphagia. Each SLT is ethically responsible for achieving the appropriate level of training to perform FEES competently.

The core pre-requisite knowledge and skills are:

- Post-graduate dysphagia training
- Advanced clinical knowledge of normal and disordered anatomy and physiology for respiration, airway protection and swallowing
- Current and regularly updated skills and knowledge in dysphagia
- Knowledge of swallowing changes over the lifespan
- Experience in working independently with dysphagic patients (minimum three years)
- Competence in performing videofluoroscopy independently
- Knowledge of the indications and contraindications for different instrumental evaluations
- Relevant local and national dysphagia policies e.g. RCSLT Clinical Guidelines(20) and this document

Knowledge required to perform FEES

The SLT clinician will be able to:

- Select appropriate patients for FEES
- Recognise anatomical landmarks as viewed endoscopically
- Recognise altered anatomy as it relates to swallowing function
- Identify elements of a comprehensive FEES examination
- Detect and interpret abnormal swallowing findings

- Apply appropriate treatment interventions- postural changes, manoeuvres, consistency selection and modification
- Make appropriate recommendations to guide management
- Make appropriate referral or request second opinion e.g. ENT, neurology, other expert SLT
- Request a second opinion from ENT when anatomical variation is suspected
- Know when and how to re-evaluate the swallow
- Use FEES as a biofeedback and teaching tool

Skills required to perform FEES

The Endoscopist (SLT)

- Operate, maintain and disinfect the equipment needed for an endoscopic evaluation
- Insert and manipulate the scope in a manner which minimises discomfort and risk and optimises the view of the laryngopharynx
- Apply topical anaesthetic/decongestant if required (see section 3.2)

The Assessing Clinician (SLT)

- Direct the patient through appropriate tasks and manoeuvres as required for a complete and comprehensive examination.
- Direct the endoscopist to achieve the desired view
- Monitor the patient's comfort and safety and know when to discontinue the procedure
- Interpret, communicate and document findings

2.2 Methods of acquisition of the knowledge and skills

Competence in FEES may be acquired using a range of learning methods including:

- Didactic/classroom teaching (internal/external)
- E-learning
- Attendance at established FEES clinics
- Mentoring
- Practice interpretation of previously-recorded FEES examinations
- Supervised clinical experience, including observation and guided practice
- Peer review of clinical practice
- Attendance at relevant conferences
- Journal clubs (critical appraisal of the literature)

2.3 Training structure

These are the minimum suggested requirements suggested for the SLT to achieve competency. There are separate competencies for the distinct roles of the endoscopist and the assessing clinician. If the SLT clinician aims to become competent in both roles, both sets of competencies should be fully completed. It is the responsibility of the individual therapist to recognise when further training is required.

Endoscopy performed by an SLT

- Observation of a minimum of 2 nasendoscopy procedures performed by a competent endoscopist
- Successfully passing the nasendoscope through the nose and into the pharynx a minimum of 5 times under the direct supervision of a competent endoscopist
- Successfully performing nasendoscopy for the purposes of FEES under direct supervision 10 times.
- Cleaning and disinfecting the scope according to local infection control policies
- Administering topical anaesthetic/nasal decongestant when required.

The Assessing Clinician (SLT)

- Observation of 5 FEES examinations carried out by an SLT competent in FEES
- Rating of 5 previously recorded FEES with a competent SLT. This will take the form of the trainee and the FEES-competent SLT observing the FEES recordings together and the trainee completing a rating scale under direct supervision. *(See Appendix D for sample rating form)*
- Carrying out and interpreting 10 FEES procedures under the direct supervision of a SLT competent in FEES.

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

We acknowledge that at the time of writing this update, the availability of formal FEES training opportunities and established FEES clinics nationally remains limited.

2.4.1 Levels of competency and expertise for the SLT endoscopist

The SLT endoscopist can perform endoscopy for FEES once the competencies have been completed. However, the SLT endoscopist should seek supervision and support from a level 3 SLT clinician or a medical practitioner for complex cases. Examples of complex cases include patients who are ventilator-dependent and tracheostomised, have highly disordered anatomy, are highly anxious or have severe respiratory compromise. This list is non-exhaustive and excludes high risk patients for whom an ENT surgeon should perform the endoscopy for FEES (see section 1.3).

Levels of competency and expertise for the Assessing Clinician

Level One

- Has pre-requisite knowledge and skills (see section 2.1)
- Undergoing training to become competent in FEES as defined in section 2.3

Level Two

- Competent to perform FEES independently i.e. without direct supervision
- Has the knowledge and skills and has achieved competencies outlined in sections 2.1 and 2.3
- Performs FEES on complex cases with supervision from a level 3 clinician. Examples of complex cases include patients who are ventilator-dependent and tracheostomised, have highly disordered anatomy, are highly anxious or have severe respiratory compromise. This list is non-exhaustive.

Once the SLT clinician has completed 50 examinations at level 2 (i.e. in addition to the 10 examinations required to reach level 2) he/she can supervise and train level 1 SLT clinicians in non-complex cases.

Level Three

- Expert practitioner
- Can supervise and train others including complex cases
- Can perform FEES assessment 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 health care practitioner)
- Has performed a minimum of 150 FEES assessments i.e. carrying out and interpreting the procedure.
- Performs FEES on complex cases independently

2.5 Verification of competency attained

Endoscopy competency will be verified by an otolaryngologist. FEES competencies will be verified by an experienced FEES clinician (level 2 with 50 FEES examinations completed at this level or level 3). A competency checklist is attached *(Appendix E)*.

2.6 Maintenance of competencies

SLTs are responsible for maintaining their competency to perform FEES and to ensure the pre-requisites for practice are in place. It is anticipated this would involve regular practice (at least monthly). There is a professional responsibility to review competencies for FEES if the procedure has not been performed for one year.

Section 3

Procedural issues

3.1 The FEES Procedure

FEES involves passing a nasendoscope transnasally to evaluate laryngopharyngeal anatomy and physiology related to swallowing, laryngopharyngeal sensation, management of secretions, trials of foods/fluids and therapeutic techniques. *See Appendix A for FEES protocol.*

FEESST is Fibreoptic Endoscopic Evaluation of Swallowing with Sensory Testing. FEESST uses a nasendoscope with an internal port or an endosheath through which air pulses are delivered. The air pulses of increasing intensity are administered to the mucosal surfaces innervated by the superior laryngeal nerve to elicit the laryngeal adductor reflex and thus determine sensory thresholds(2).

3.2 Health and Safety

First aid and resuscitation

Due to the invasive nature of the procedure, SLT's involved in performing FEES must undergo regular training in first aid and CPR. Resuscitation equipment and trained personnel (medical, nursing and physiotherapy) should be within easy access i.e. a fully equipped crash trolley should be located on the same floor of the building and medical staff must be within the building and readily contactable.

Anaesthesia and decongestants

Topical anaesthesia and/or nasal decongestant may be applied to the nasal passages if required. Since May 2004 SLT's are entitled to administer topical anaesthesia under patient Group Directions (document MLX 294)(21, 22).

FEES can be performed without anaesthesia. Routine use is not recommended as sensory aspects of the swallow may be compromised. SLT's should be aware of

possible contraindications and adverse reactions. Lubrication gel applied to the nasendoscope should be sufficient to minimise discomfort in most cases.

Environments

FEES should be performed in an appropriate setting with ready access to a doctor (see 1.4). This may be on a hospital ward, rehabilitation unit, on the intensive care unit or in a designated clinic. If FEES is to be used in other environments such as nursing homes, SLT's must be a level three FEES practitioner (see 2.4), a doctor must be available for immediate assistance (and therefore within the same building), the nursing home and patient's GP must have given consent and appropriate equipment must be used (see 1.9).

Food colouring

Drops of blue or green food dye may be added to secretions, food and liquids to facilitate visualisation. The amount used should be kept to a minimum as it can colour urine and skin. Bottles of dye should be stored appropriately and once opened should be disposed of after three months. The use of Methylene Blue is not recommended, as it is a biologically active product.

Disposal of food and fluid materials

All used trial foods and fluids should be disposed of appropriately at the end of each FEES procedure. Any used items of consumable equipment (*see Appendix C)* should be disposed of as clinical waste or as advised by local infection control policy.

Decontamination and infection control

Disease transmission is possible via contact of equipment contaminated by saliva, blood and other bodily fluids. Sterilisation and storage of equipment should adhere to universal, local and institutional infection control policies to avoid cross infection. Endoscope use should be recorded according to local guidelines to ensure traceability.

Patients with known infection status should be seen at the end of the FEES clinic if possible and the nature of the infection documented.

Appropriate precautions should be taken if substances hazardous to health are to be used for equipment decontamination.

Adverse effects of the procedure

FEES is a safe procedure but there are possible complications. The following have been reported:

- Patient discomfort. Although quite common, discomfort is usually mild(4, 23).
- Epistaxis. Nose bleeds are unusual despite FEES being performed on many stroke patients placed on anticoagulant medications(1).
- Vasovagal response. This is unusual and may be related to very high levels of anxiety. Exercise caution if the patient has a history of fainting.
- Reflex syncope. Fainting can occur as a result of direct vigorous stimulation of the nasal/pharyngeal/laryngeal mucosa during endotracheal intubation. The type of stimulation occurring for FEES is much less forceful hence this complication is rare. However, caution must be exercised in patients with unstable cardiac conditions for whom reflex syncope would result in further risk(1).
- Allergy to topical anaesthesia (see "Anaesthesia and decongestants")
- Laryngospasm. This is unlikely if the nasendoscope is adequately distanced from the larynx(1).

A survey carried out in 1995 by Langmore on the safety of FEES found that of 6000 procedures there were only 27 cases of the adverse effects noted above. 3.7% of FEES procedures were aborted compared with 3.1% of videofluoroscopy procedures due to side affects such as gagging or aspiration requiring suctioning(1).

As with any swallowing investigation, the examination should be performed with care to avoid the risk of complications arising from severe aspiration.

Indications and contraindications

When considering performing a FEES examination, the SLT must always consider possible contraindications. These are outlined in section 1.3. The rationale for performing FEES on an at-risk patient must be clearly outlined in patient records. Failure to demonstrate and record careful consideration of the risks and benefits to the patient in these circumstances prior to proceeding with the FEES examination may constitute a breach of acceptable professional conduct (see Section 4, Medico-legal Issues).

Incident reporting

If an adverse reaction occurs during a FEES procedure, appropriate medical assistance should be sought and local incident reporting procedures followed.

3.3. Patient and carer information

Patients should be fully informed about the FEES procedure prior to the examination. Information should be given in verbal and written form and include the nature, purpose and likely effects of the examination *(see Appendix F).*

3.4 Consent

The NHS Good Practice in Consent (24) states the need for changes in the way patients are consented. It is recognised that consent procedures vary between Trusts.

Prior to FEES being carried out, the Speech and Language Therapist must explain the procedure and provide written information where appropriate to the patient and/or their carer (see appendix). FEES is an invasive procedure that carries some risks and hence written consent should be obtained prior to the examination. Where the patient is unable to give or withhold consent e.g. dementia, it may still be appropriate to proceed with treatment if it is considered clinically necessary and in the best interest of the individual. Such decisions are governed by legislation and should be taken under advice and within the context of a multidisciplinary team(25, 26). Consent should be documented in the patient's records.

Consent policy must be reviewed regularly and adapted in light of regular local and national changes.

3.5 Documentation

Archives:

The FEES should always be recorded either on video or digitally and videotapes and storage media labelled and securely stored. Failure to do so may result in a breach of confidentiality. Documentation should be kept according to the RCSLT professional guidelines.

Rating

Structured rating formats are available 1(see section 1.1.1)(1, 17, 27, 28)

See Appendix G for sample airway protection, penetration-aspiration and secretion rating scales.

3.6 Audit

FEES services should be audited on a regular basis within a local clinical governance framework.

Section 4

Medico-legal issues

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 policy statement 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.

Policy Review

A review of this policy in two years (2009) is advised.

References

1. Langmore SE. Endoscopic Evaluation and Treatment of Swallowing Disorders: Thieme Publishers NY; 2001.

2. Aviv JE, Kim T, Sacco RL, Kaplan S, Goodhart K, Diamond B, et al. FEESST: a new bedside endoscopic test of the motor and sensory components of swallowing. Annals of Otology, Rhinology & Laryngology 1998;107(5 Pt 1):378-87.

3. Langmore SE, Schatz K, Olsen N. Fiberoptic endoscopic examination of swallowing safety: a new procedure. Dysphagia 1988;2(4):216-9.

4. Aviv JE, Kaplan ST, Thomson JE, Spitzer J, Diamond B, Close LG. The safety of flexible endoscopic evaluation of swallowing with sensory testing (FEESST): an analysis of 500 consecutive evaluations. Dysphagia 2000;15(1):39-44.

5. Cohen MA, Setzen M, Perlman PW, Ditkoff M, Mattucci KF, Guss J. The safety of flexible endoscopic evaluation of swallowing with sensory testing in an outpatient otolaryngology setting. Laryngoscope 2003;113(1):21-4.

6. Langmore SE, Schatz K, Olson N. Endoscopic and videofluoroscopic evaluations of swallowing and aspiration. Annals of Otology, Rhinology & Laryngology 1991;100(8):678-681.

7. Perie S, Laccourreye L, Flahault A, Hazebroucq V, Chaussade S, St Guily JL. Role of Videoendoscopy in Assessment of Pharyngeal Function in Oropharyngeal Dysphagia: Comparison with Videofluoroscopy and Manometry. Laryngoscope 1998;108:1712-1716.

8. Wu CH, Hsiao TY, Chen JC, Chang YC, Lee SY. Evaluation of swallowing safety with fiberoptic endoscope: comparison with videofluoroscopic technique. Laryngoscope 1997;107(3):396-401.

9. Kelly AM, Leslie P, Beale T, Payten C, Drinnan MJ. Fibreoptic endoscopic evaluation of swallowing and videofluoroscopy: does examination type influence perception of pharyngeal residue severity? Clinical Otolaryngology 2006;31 (5):425-32.

10. Kelly AM, Drinnan MJ, Leslie P. Assessing penetration and aspiration: how do videofluoroscopy and fibreoptic endoscopic evaluation of swallowing compare? Laryngoscope 2007;117 (10:1723-1727.

11. Rao N, Brady SL, Chaudhuri G, Donzelli JJ, Wesling MW. Gold-standard? Analysis of the videofluoroscopic and fiberoptic endoscopic swallow examinations. Journal of Applied Research 2003;3(1):89-96.

12. Hartnick CJ, Hartley BE, Miller C, Willging JP. Pediatric fiberoptic endoscopic evaluation of swallowing. Annals of Otology, Rhinology & Laryngology 2000;109(11):996-9.

13. Leder SB, Espinosa JF. Aspiration risk after acute stroke: Comparison of clinical examination and fiberoptic endoscopic evaluation of swallowing. Dysphagia 2002;17(3):214-218.

14. Leder SB. Fiberoptic endoscopic evaluation of swallowing in patients with acute traumatic brain injury. Journal of Head Trauma Rehabilitation 1999;14(5):448-453.

15. Ajemian MS, Nirmul GB, Anderson MT, Zirlen DM, Kwasnik EM. Routine fiberoptic endoscopic evaluation of swallowing following prolonged intubation: implications for management. Archives of Surgery 2001;136(4):434-7.

16. Denk DM, Swoboda H, Schima W, Eibenberger K. Prognostic factors for swallowing rehabilitation following head and neck cancer surgery. Acta Oto Laryngologica 1997;117(5):769-74.

17. Colodny N. Interjudge and intrajudge reliabilities in fiberoptic endoscopic evaluation of swallowing (fees) using the penetration-aspiration scale: a replication study. Dysphagia 2002;17(4):308-15.

18. Logemann JA, Rademaker AW, Pauloski BR, Ohmae Y, Kahrilas PJ. Interobserver agreement on normal swallowing physiology as viewed by videoendoscopy. Folia Phoniatrica et Logopedica 1998;51(3):91-8.

19. Kidder TM, Langmore SE, Martin BJ. Indications and techniques of endoscopy in evaluation of cervical dysphagia: comparison with radiographic techniques. [Review] [13 refs]. Dysphagia 1994;9(4):256-61.

20. Royal College of Speech and Language Therapists. Clinical Guidelines.

21. Document MLX 294. Sale, Supply and Administration of Medicines by Allied Health Professionals under Patient Group Directions. Medicines and Healthcare Regulatory Agency 2004.

22. Patient Group Directions, NHS Executive, Series Number HSC 2000/026: 2000.

23. Aviv JE, Murry T, Zschommler A, Cohen M, Gartner C. Flexible endoscopic evaluation of swallowing with sensory testing: patient characteristics and analysis of safety in 1,340 consecutive examinations. Annals of Otology, Rhinology & Laryngology 2005;114(3):173-6.

24. NHS Executive. Good Practice in Consent. Health Services Circular Series Number HSC 2001/023; 2001.

25. Mental Capacity Act 2005.

26. Royal College of Speech and Language Therapists. Communicating Quality 3. 2006.

27. Murray J. The Laryngoscopic Evaluation of Swallowing or FEES. In: Manual of Dysphagia Assessment in Adults: Singular Publishing Company; 1999.

28. Rosenbek JC, Robbins JA, Roecker EB, Coyle JL, Wood JL. A penetration-aspiration scale. Dysphagia 1996;11(2):93-8.

29. American Speech and Hearing Association (ASHA). Role of the Speech-Language Pathologist in the Performance and Interpretation of Endoscopic Evaluation of Swallowing; Guidelines. 2004

Appendices

Contents

Appendix A FEES Protocol

Appendix B Indications for selecting FEES or Videofluoroscopy

Appendix C Equipment and Consumables

Appendix D Sample rating form

Appendix E Competency Development Programme

Appendix F Patient information

Appendix G Rating Scales

Appendix A.

The FEES Protocol

Part A. Laryngopharyngeal structures- anatomy and physiology

1. Velopharyngeal competency

Tasks: oral and nasal sounds, sentences and dry swallow

2. Pharynx (including base of tongue, epiglottis, valleculae, posterior and lateral pharyngeal walls, lateral channels, pyriform sinuses)

Tasks:
- Puff cheeks- dilate pharynx and open pyriform sinuses
- post-vocalic "l", - retract base of tongue
- strained high pitch on /i/- contraction of lateral pharyngeal walls
- observe general movement during speech and dry swallowing

3. Larynx and supraglottis (including aryepiglottic folds, interarytenoid space, false and true vocal folds, subglottic shelf, proximal trachea)

Tasks:
Observe laryngeal movements during
- breathing at rest
- gentle and effortful breath hold
- adduction on cough/throat clearing
- sniff
- phonation on /i/

4. Laryngopharyngeal Sensation

Tasks:
Observe briskness and adequacy of glottic closure in response to light touch of the scope against the posterior pharyngeal wall and the right and left aryepiglottic folds
During the FEES observe response to secretions, residue, penetration and aspiration (see Appendix)

5. Secretions
Use secretion rating scale (see attached). If the patient is unable to manage secretions introduce one drop of blue dye onto the tongue and observe dry swallowing.

(Appendix A continued)

Part B. Bolus Presentation

If safe, proceed with trials of the following:
Ice chips, thin liquids, thick liquids, puree, soft food, solid food, mixed consistencies. The order may vary.

Observe;

- amount and location of premature spillage,
- pharyngeal residue,
- penetration and aspiration.

Other aspects to be considered;

- timing of swallowing,
- overall strength of the swallow and whiteout,
- evidence of fatigue,
- timing of glottic closure and reopening
- regurgitation from proximal oesophagus to hypopharynx

Part C. Therapeutic Interventions

Evaluate the effectiveness of postural modifications, manoeuvres, bolus modifications, compensatory strategies and sensory enhancement on the swallow.

Part D. Biofeedback

Encourage patient to observe the examination to facilitate understanding of swallowing, recommendations, and to learn therapeutic interventions.

Appendix B

Indications for selecting FEES or Videofluoroscopy (VF)

Indications for Videofluoroscopy	Indications for FEES
▪ Evaluation of all stages of swallowing ▪ Evaluation of swallowing physiology: base of tongue retraction; velopharyngeal closure; hyolaryngeal elevation; pharyngeal contraction; upper oesophageal sphincter opening ▪ Measuring impact of therapeutic interventions on swallowing physiology ▪ Upper oesophageal dysfunction suspected ▪ Patient medically unfit or unwilling to participate in FEES	▪ High risk of aspiration ▪ Evaluation of secretion management ▪ Visualisation of altered laryngopharyngeal anatomy/physiology ▪ Impairment of laryngopharyngeal sensation is suspected ▪ Extended examination to measure effects of fatigue or therapeutic interventions ▪ Evaluation with real food and fluid ▪ Biofeedback ▪ Need for repeated swallowing examinations ▪ Patient medically unfit or unwilling to participate in videofluoroscopy ▪ Patient unable/unsafe to sit

(Bastian, R 1991; Kidder, TM 1994; Langmore, SE 2001; see also the Royal College of Speech and Language Therapists Videofluoroscopy Policy Statement 2007)

Appendix C

Equipment and Consumables

Equipment

- Fibreoptic nasendoscope (with/without air or suction ports)
- Light source
- Chip camera
- Recording source (VCR or digital)
- Monitor
- Microphone
- Trolley
- Printer
- Air pulse generator (optional)

Consumables

- Food and fluid
- Ice chips
- Food dye (green or blue)
- Gauze
- Q-tips
- Spoons
- Straws
- Cups
- Aprons
- Lubrication gel
- Alcohol wipes
- Defog spray
- Sterilising equipment
- Endosheaths (optional)
- Topical anaesthetic/decongestant

Appendix D. Sample rating form

FEES ASSESSMENT REPORT

Patient Name:	Hospital Number:
Date of Birth	Date of Assessment:
Consultant	Lead Therapist

Diagnosis:

Other relevant Medical / Surgical History:

Consistencies	**Outcome**
Ice chips	________________
Thin	________________
Thick Syrup	________________
Thick custard	________________
Puree	________________
Solid	________________
Tablet	________________

Summary of Assessment

Recommendations

-
-
-
-
-

Based on the FEES assessment report at University College Hospital London. With thanks to Northwick Park Hospital.

Appendix D (continued). Sample rating form

ASSESSMENT INFORMATION

A NASOPHARYNX **COMMENTS**

Anatomy	WNL / ONL	______________________
Symmetry of Closure	WNL / ONL	______________________
Degree of closure	WNL / ONL	______________________
Speed of closure	WNL / ONL	______________________
Closure pattern	Circular / Coronal Lateral / P.Ridge	______________________

B BASE OF TONGUE

Anatomy	WNL / ONL	______________________
Symmetry of movement	WNL / ONL	______________________
Speed of movement	WNL / ONL	______________________
Range of movement	WNL / ONL	______________________

C HYPOPHARYNX

Anatomy	WNL / ONL	______________________
Symmetry	WNL / ONL	______________________
Speed of movement	WNL / ONL	______________________
Range of movement	WNL / ONL	______________________

D LARYNX

Anatomy	WNL / ONL	______________________
Symmetry at rest	WNL / ONL	______________________
Speed of abduction	WNL / ONL	______________________
Rate of movements	WNL / ONL	______________________
Symmetry of closure & phonation	WNL / ONL	______________________
Vocal fold lengthening	WNL / ONL	______________________
Vertical laryngeal movement	WNL/ ONL	______________________

Based on the FEES assessment report at University College Hospital London. With thanks to Northwick Park Hospital.

Appendix D (continued). Sample rating form

E AIRWAY PROTECTION *(Murray 1999)*

Breath holding not achieved
Transient breath holding with glottis open
Sustained breath holding with glottis open
Transient true fold closure
Sustained true fold closure
Transient true and ventricular fold closure
Sustained true and ventricular fold closure
Vocal fold closure on voluntary cough

Comments:

F SECRETION RATING *(Murray 1999)*

O Normal rating: ranges from no visible secretions anywhere in the hypopharynx, to some transient secretions visible in the valleculae and pyriform sinuses. These secretions are not bilateral or deeply pooled.

1 Any secretions evident upon entry or following a dry swallow in the protective structures surrounding the laryngeal vestibule that are bilaterally represented or deeply pooled. This rating would include cases in which there is transition in the accumulation of secretions during observation segment.

2 Any secretions that change from "1"" to a "3" rating during the observation period.

3 Most severe rating. Any secretions seen in the area defined as laryngeal vestibule. Pulmonary secretions are included if they are not cleared by swallowing or coughing by the close of the segment.

G PENETRATION – ASPIRATION SCALE *(Rosenbek 1996)*

1 Material does not enter the airway
2 Material enters the airway, remains above the vocal folds and is ejected from the airway
3 Material enters the airway, remains above the vocal folds, and is not ejected from the airway
4 Material enters the airway, contacts the vocal folds, and is ejected from the airway
5 Material enters the airway, contacts the vocal folds, and is not ejected from the airway
6 Material enters the airway, passes below the vocal folds, and is ejected into the larynx or out of the airway
7 Material enters the airway, passes below the vocal folds, and is not ejected from the trachea despite effort
8 Material enters the airway, passes below the vocal folds, and no effort is made to eject

Liquids……………………………………………….
Thick liquids………………………………………….
Puree…………………………………………………..
Soft Solid……………………………………………..
Solid…………………………………………………..

Based on the FEES assessment report at University College Hospital London. With thanks to Northwick Park Hospital.

Appendix D (continued). Sample rating form

H MANOEUVRES & STRATEGIES OUTCOME

Chin tuck ______________________________

Head turn right ______________________________

Head turn left ______________________________

Head tilt right ______________________________

Head tilt left ______________________________

Breath hold ______________________________

Supra-glottic swallow ______________________________

Super supra-glottic swallow ______________________________

Effortful swallow ______________________________

Liquids to clear solid residue ______________________________

Other ______________________________

I SENSATION
(overall impression & comments)

Assessing Clinician
Specialist Speech & Language Therapist

Endoscopist
Specialist Registrar / Consultant / Speech and Language Therapist

Based on the FEES assessment report at University College Hospital London. With thanks to Northwick Park Hospital.

Appendix E

Competency Development Programme for the Assessing Clinician (SLT)

Topic	**Date Achieved**	**Signature Trainee**	**Signature Supervisor**
Read RCSLT Position Statement on FEES			
Obtain “core pre-requisite knowledge and skills” (RCSLT Position Statement FEES)			
Obtain “knowledge required to perform FEES” (RCSLT Position Statement FEES)			
Demonstrate knowledge of local policies / guidelines on consent and health and safety			
Observe 5 FEES examinations			
Rate 5 previously-recorded FEES with supervisor			
Successfully perform and interpret 10 FEES under direct supervision (see additional competency assessment list)			

Appendix E (continued)

Competency Development Programme for the endoscopist (SLT)

Topic	Date Achieved	Signature Trainee	Signature Supervisor
Read RCSLT Position Statement on FEES			
Obtain “core pre-requisite knowledge and skills” (RCSLT Position Statement FEES)			
Obtain “knowledge required to perform FEES” (RCSLT Position Statement FEES)			
Demonstrate knowledge of local policies / guidelines on consent and health and safety			
Observe 2 nasendoscopy procedures			
Successfully pass nasendoscopy 5 times under direct supervision			
Successfully perform nasendoscopy for FEES under direct supervision 10 times			
Clean and disinfect nasendoscope according to local infection control policies			
Administer topical anaesthetic/nasal decongestant when required			

Appendix F Patient information

Fibreoptic Endoscopic Evaluation of Swallowing (FEES) Clinic
SAMPLE INFORMATION SHEET

You have been given an appointment to attend the FEES Swallowing Clinic. This is a clinic co-ordinated by *name*, Speech & Language Therapist. This information sheet provides you with some information about the clinic.

1. **Why have I been given an appointment in the clinic?**

You have been referred to the speech & language therapy department because you have had some difficulties swallowing or have had surgery or other treatment that may affect your swallowing. The Speech & Language Therapists are trained to assess and treat swallowing problems. The FEES examination enables us to assess your swallowing. It also enables us to try different foods and/or different techniques to help you swallow more effectively.

2. **What happens during the assessment?**

A team of two people will carry out the examination. This team will be made up of one speech and language therapist and one doctor, or two speech and language therapists. Other members of staff, such as a nurse or a physiotherapist may also be present.
You will be asked to sit in a comfortable chair. If you are currently in hospital, the assessment will be carried out while you are in bed or sitting in a chair. A small, flexible endoscope will be placed into one nostril and moved through your nose. When the end of the endoscope is positioned just beyond the back of the nose, a clear view of your throat is obtained. You will be able to see your throat (including your vocal cords) on the television monitor if you choose. You may be given some food and liquid to swallow. This is dyed with a small amount of blue or green food dye to enable a clear view of your swallowing. Your swallowing will be observed and recorded for analysis at a later time.

3. **When will I know the results?**

You will be given some basic feedback and advice immediately after the procedure. However, detailed results will only be available when a report has been written. The report will be sent to your doctor and a copy will be filed in your medical notes.

4. **Is the procedure safe? Is it uncomfortable?**

The procedure is safe and rarely has side affects. At times the passing of the endoscope through the nose causes mild to moderate discomfort. Once the endoscope is positioned above the throat, any discomfort usually recedes.

Appendix F (continued) Patient information

5. **How long will it take?**

The procedure takes approximately 10 to 15 minutes. For outpatients, the clinic generally runs on time although you may experience a small delay. Your patience in these circumstances would be appreciated.

6. **Can I eat before my appointment?**

Unless you have been advised otherwise, you can eat and drink as normal before your appointment. If you are currently feeding through a tube, you can take your feeds as normal up until your appointment time.

7. **What happens afterwards?**

You can return to the ward or go home immediately after the appointment. If appropriate, a follow-up appointment will be made for you to see the speech & language therapist to discuss the results in more detail, and to give you further advice and exercises to make your swallowing easier. You may also have an appointment made for you to attend the outpatients department.

If you have any questions about the clinic or the procedure, call *name*, Speech and Language Therapist on *telephone number* (Monday to Friday).

Appendix G Sample Rating Scales

Patterns of Tight Breath Holding

1. Breath holding not achieved
2. Transient breath holding with glottis open
3. Sustained breath holding with glottis open
4. Transient true vocal fold closure
5. Sustained true vocal fold closure
6. Transient true and ventricular fold closure
7. Sustained true and ventricular fold closure

Murray (1999) "The Laryngoscopic Evaluation of Swallowing or FEES". In Mannual of Dysphagia Assessment in Adults, 1999, Singular Publishing Company.

Secretion Severity Rating Scale

0 Normal rating: Ranges from no visible secretions anywhere in the hypopharynx, to some transient secretions visible in the valleculae and pyriform sinuses. These secretions are not bilateral or deeply pooled.

1 Any secretions evident upon entry or following a dry swallow in the protective structures surrounding the laryngeal vestibule that are bilaterally represented or deeply pooled. This rating would include cases in which there is a transition in the accumulation of secretions during observation segment.

2 Any secretions that change from "1" rating to a "3" rating during the observation period.

3 Most severe rating. Any secretions seen in the area defined as laryngeal vestibule. Pulmonary secretions are included if they are not cleared by swallowing or coughing by the close of the segment.

Murray (1999) "The Laryngoscopic Evaluation of Swallowing or FEES". In Mannual of Dysphagia Assessment in Adults, 1999, Singular Publishing Company.

(Appendix G continued)

Penetration-Aspiration Scale

1 Material does not enter the airway

2 Material enters the airway, remains above the vocal folds, and is ejected from the airway

3 Material enters the airway, remains above the vocal folds, and is not ejected from the airway

4 Material enters the airway, contacts the vocal folds, and is ejected from the airway

5 Material enters the airway, contacts the vocal folds, and is not ejected from the airway

6 Material enters the airway, passes below the vocal folds, and is ejected into the larynx or out of the airway

7 Material enters the airway, passes below the vocal folds, and is not ejected from the trachea despite effort

8 Material enters the airway, passes below the vocal folds, and no effort is made to eject

Rosenbek, J et al, (1996) Dysphagia Vol 11. pp93-98