South Australian Acute Hospital Program for Credentialing Speech Pathologists in the Extended and Advanced Practice Role of Independent Fibreoptic Endoscopic Evaluation of Swallowing (FEES) 2016

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Supersedes - South Australian Acute Hospital programme for credentialing Speech Pathologists in Fiberoptic Endoscopic Evaluation of Swallowing (FEES) 2008
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<th>Prepared by</th>
<th>SA FEES Working Party</th>
<th>Year</th>
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<td></td>
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<td>2007</td>
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<tr>
<td>Version 0.2</td>
<td>Revised by</td>
<td>SA FEES Working Party</td>
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Introduction

Fibreoptic Endoscopic Evaluation of Swallowing (FEES) allows visualisation and evaluation of the structures and functions of the swallowing mechanism at the velopharynx, oropharynx, pharynx and larynx using a fibreoptic scope passed trans-nasally. The procedure is performed with or without topical anaesthetic (usually co-phenylcaine forte containing: Lignocaine Hydrochloride, Phenylephrine Hydrochloride, Benzalkonium Chloride), depending on patient tolerance and comfort. The patient is directed to perform non-gustatory tasks to evaluate sensation and motor function in the pharynx and larynx (Logemann, Schatz and Olsen 1988, ASHA 2002; Langmore 2001). A variety of foods and fluids may be used to assess swallow, leading to recommendations regarding the adequacy of the swallow, the safety of oral feeding and appropriate manoeuvres to improve swallowing.

FEES is a portable procedure that may be performed at patient bedside or in a clinic setting.

FEES can be implemented:

- jointly by a medical officer and speech pathologist, where the medical officer inserts the nasendoscope and the speech pathologist is predominately responsible for the procedure and interpretation.

- independently by the speech pathologist, who performs the technical, procedural and interpretive aspects of the examination.

FEES is not intended to replace laryngoscopy by an Otolaryngologist but rather to assess swallow function and determine management and therapy.

Any structural or mucosal abnormality identified during the procedure must be referred on for Otolaryngology and/or Gastroenterology examination or, if dysphagia aetiology is uncertain, performed in conjunction with a medical officer.

And (for independent Speech Pathology FEES)

- in a medical setting/environment where
  - A key medical consultant (clinical sponsor) has endorsed the training and credentialing requirements for independent Speech Pathology Fibreoptic Endoscopic Evaluation of Swallowing.
  - Executive endorsement has been obtained for this extended practice
  - Medical intervention is immediately available on site in the event of an incident.
  - Medical opinion can easily be sourced for diagnostic/management opinion in the event of anatomical abnormality or uncertain aetiology.

The following document describes the agreed competency based training process for South Australian speech pathologists wishing to be credentialed to perform FEES at an advanced practice level, or independently at an extended practice level.

The scope of this document is to provide guidelines to credential speech pathologists at an Extended Practice level i.e., conducting FEES independently, enabling them to be responsible for all aspects of the study including the technical component i.e. inserting and controlling the nasendoscope, in addition to the procedural and interpretive components.

And optionally to provide guidelines for competency at an Advanced Practice level, performing the procedural and interpretive components of the FEES study.

It further describes the annual maintenance of credentialing. It has been developed by a working party with representation from the Speech Pathology Departments from the Royal Adelaide Hospital, Queen Elizabeth Hospital, Repatriation General Hospital and Flinders Medical Centre and endorsed by the Heads of Departments of Otolaryngology and Gastroenterology at these centres.
**Competency Components**

The following program is divided into four main training sections, and two sections addressing maintenance and re-entry requirements.

**SECTION 1** Pre-requisite experience, skill and theoretical knowledge of FEES  
- Competencies 1.1.1 – 1.4.5

**SECTION 2** Core competencies for Technical aspects of FEES  
- Competencies 2.1.1 – 2.3.6

**SECTION 3** Core competencies for Procedural aspects of FEES  
- Competencies 3.1.1 – 3.4.2

**SECTION 4** Core competencies for Interpretation and Reporting of FEES  
- Competencies 4.1.1 – 4.2.4

**SECTION 5** Core competencies for Maintenance of Knowledge and Skill  
- Competencies 5.1.1 – 5.2.1

**SECTION 6** Core competencies for Extended Leave  
- Competencies 6.1.1 – 6.2.1

**SECTION 7** Core Competencies for Recognition between Organisations  
- Competencies 7.1.1-7.2.4

To pass the scope and report findings sections 1-4 must be completed. If not passing the scope **Sections 1, 3 and 4** must be completed.

**Competencies must be signed-off by**

- a supervisor, who may include a suitably qualified speech pathologist, or otolaryngologist or other medical practitioner with expertise in the performance and interpretation of FEES. (Fibreoptic Endoscopic Evaluation of Swallowing Position Paper SPA 2007 p11)
- the department director/manager. In the event the manager is the credentialing candidate, fulfilment of the program may be signed off by an alternative departmental manager from within the same Local Health Network.
- the medical officer (clinical sponsor) involved in the training and supervision of the technical aspects of FEES and/or the Head of Unit endorsing the guidelines.

Entry into the training programme is at the discretion of, and determined by the departmental management. The department manager is responsible for final sign-off on successful completion of the protocol prior to organisational endorsement and regional credentialing requirements.

The Competency Tables – Appendix C should be used for sign-off by the supervisor for achievement and tracking of competencies achieved.

The following provide an outline of expected competencies and resources.
Section 1: Core competencies
Pre-requisite experience and skill in, and theoretical knowledge of, Fibreoptic Endoscopic Evaluation of Swallowing (FEES)

FEES is considered an advanced practice skill, within Speech Pathology Australia scope of practice (SPA 2007). The technical aspect of F.E.E.S is considered an extended practice skill, within the South Australian Speech Pathology definition of scope of practice.

FEES is not a competency expected of, or appropriate for entry-level Speech Pathologists. (Competency Based Occupational Standards (CBOS), Speech Pathology Australia, 2001, 2007; Cimoli and Sweeney 2012).

Speech Pathologists intending to undertake training in FEES are expected to demonstrate advanced knowledge and skill in assessment and management of dysphagia as outlined in Section 8.1 of the Speech Pathology Australia Dysphagia Position Paper (Speech Pathology Australia 2012) and local/regional dysphagia policies.

The South Australian FEES review committee would like to acknowledge the work of Queensland Health, ClinEdQ Fibreoptic endoscopic evaluation of Swallowing (FEES) Competency Training Program, 2012 in the current review of this document.

In order to commence FEES competency training, clinicians must fulfil the following pre-requisite requirements.

SECTION 1  Pre-Requisite Experience, Skill and Theoretical Knowledge of FEES

Competency 1: Relevant Pre-requisite Experience

1.1.1 General clinical experience in relevant health setting – minimum 3 years’ experience, minimum AHP2 level, eligible for membership SPA, current credentialing registration.

1.1.2 General Dysphagia clinical experience - competency and independence in clinical dysphagia assessment and management.

1.1.3 Meets professional membership and state Allied Health credentialing requirements.

1.1.4 Has participated in organisational mandatory training including standard resuscitation training and infection control

Competency 2: Advanced Dysphagia Knowledge and Experience

1.2.1 Advanced clinical knowledge of medical terminology for respiration, airway protection and swallowing

1.2.2 Advanced clinical knowledge of principles and techniques of swallowing assessment and therapy.

1.2.3 Knowledge of swallowing changes over the lifespan as relevant to caseloads.

1.2.4 Competence in performing and interpreting videofluoroscopy (Modified Barium Swallow – MBS) independently

1.2.5 Knowledge of the indications, contraindications and validity for different instrumental evaluations including MBS and FEES
1.2.6 Ability to integrate knowledge of FEES to select suitable patients for FEES and support colleagues to recognise potential candidates for FEES.

1.2.7 Demonstrate knowledge of patient populations where FEES may be particularly beneficial or advantageous.

1.2.8 Demonstrate ability to triage referrals and prioritise patients as needed.

1.2.9 Knowledge of professional, local, site, regional and national dysphagia policies, position papers, credentialing requirements.

**Competency 3: Advanced knowledge of normal and altered anatomy and physiology of swallow**

1.3.1 Knowledge of normal aero digestive anatomy including nasal, oral, pharyngeal, laryngeal and oesophageal structures.

1.3.2 Knowledge of altered (abnormal/ post-surgical) aero digestive anatomy including nasal, oral, pharyngeal, laryngeal and oesophageal anatomy as it relates to administering FEES including indications and contraindications.

1.3.3 Knowledge of normal aero digestive physiology and neurological innervation as it relates airway protection and swallowing.

1.3.4 Knowledge of altered aero digestive physiology and neurological innervation and its impact on airway protection and swallowing.

**Competency 4: Understanding of safety and risk management**

1.4.1 Knowledge of anaesthetics – indications, contra-indications, local protocols for administration.

1.4.2 Knowledge of risks, adverse effects and emergency management.

1.4.3 Knowledge of infection control and standard precautions.

1.4.4 Current Basic Life Support training.

1.4.5 Knowledge of patient consent.

**Recommended reading.**

Adrian et al (1956) Fatalities following topical application of local anaesthetics to mucous membranes. *JAMA* 162(17): 1527-1530


Hapner ER. *Training and Interpretation of FEES in adults – DVD*. Plural Publishing


Section 2: Core competencies
Technical Aspects of Nasendoscopy

The Technical aspect of FEES involves inserting and positioning the nasendoscope to enable adequate viewing of the pharynx and larynx during swallow assessment – flexible nasendoscopy. This procedure historically, has been the responsibility of the ENT surgeon and Gastroenterologist.

The speech pathologist may perform the nasendoscopy with the appropriate executive support and medical training support and completion of the credentialing requirements as follows.

- Direct observation of medical officer or credentialed speech pathologist completing nasendoscopy
- Preliminary practice of nasendoscopy on healthy volunteers under direction of medical officer or experienced FEES clinician,
- Minimum 20 procedures of nasendoscopy with demonstrated competency performed on patients. Two of the final scopes demonstrating technical competency should be performed under direct supervision of a medical practitioner (clinical sponsor) and achievement of technical competency signed off. Ongoing maintenance of technical skill is achieved by performing 10 scopes per year, including 2 under direct medical supervision. In the event of failure to demonstrate competency, further scope experience will be required until technical competency is demonstrated. Refer to maintenance section for full requirements.
- Signed and dated records to be kept as part of departmental mandatory training requirements (Appendix A)

SECTION 2  Technical Aspects of FEES

Competency 1: Knowledge of Equipment

2.1.1 Knowledge of facility specific imaging equipment and specific nasendoscopes including safe and effective operation and maintenance of the equipment in accordance with manufacturer’s instructions

2.1.2 Knowledge of facility specific infection control guidelines and universal precautions for nasendoscopes.

2.1.3 Knowledge of ward specific infection control guidelines and universal precautions.

2.1.4 Knowledge of facility specific patient safety policies relevant to areas used for FEES

2.1.5 Knowledge of and ability to adhere to facility specific guidelines, for contamination and infection control as related to conducting FEES and cleaning nasendoscopes.

Competency 2: Insertion of Nasendoscope

2.2.1 Knowledge of anatomy of the nose, pharynx and larynx as related to nasendoscopy procedure

2.2.2 Knowledge of atypical nasal anatomy and implications for passing scope

2.2.3 Ability to insert and manoeuvre and remove the nasendoscope through the nasal passage in a manner that minimises adverse reactions and patient discomfort

2.2.4 Ability to manipulate the nasendoscope in the pharynx to obtain optimal view of the velopharynx, oropharynx/hypopharynx, larynx during the swallowing examination
Competency 3: Health and Safety Performance of FEES within a risk management framework

2.3.1 Completed mandatory training in cardio-pulmonary resuscitation as required by the organisation on an annual basis.

2.3.2 Completed mandatory training in infection control and standard patient specific precautions as required by the organisation on an annual basis for safe environment and practice for FEES procedures.

2.3.3 Knowledge of and ability to respond to clinical signs related to adverse events.

2.3.4 Knowledge of reporting and documentation of adverse events.

2.3.5 Ability to maintain a safe workplace

2.3.6 Able to identify and manage patient-related factors to optimise patient safety regarding placement or positioning of nasendoscope.

Recommended reading

Hapner ER. Training and Interpretation of FEES in adults – DVD. Plural Publishing


Additional resources

Anatomy of nasal cavity: http://www.youtube.com/watch?v=FUa12oXwYZY&feature=related

Upper Airway Anatomy During Trans-Nasal Endoscopy (HD) http://www.youtube.com/watch?v=Z6zRxfBE3ws
The procedural component of FEES requires an ability to direct the patient through the appropriate tasks and manoeuvres to obtain a complete and comprehensive FEES examination.

The procedural knowledge and skills required for competency are summarized to include:

- Identification of suitable patients for FEES assessment.
- Performance of a comprehensive FEES protocol
- Recognition of disordered swallow function in relation to bolus transit and saliva management
- Ability to determine appropriate food and fluid trials and swallowing manoeuvres and compensatory strategies

Method of attaining Procedural knowledge and skills:

- Direct observation of experienced FEES clinician completing interpretation competencies.
- Graded participation in FEES procedures under direct supervision of experienced FEES clinician.
- Read relevant chapters of Langmore (2001) textbook.
- Review relevant websites and DVD images as per reading list
- Discussion with relevant others, Medical officers, credentialed speech pathologists.

**SECTION 3  Procedural Aspects of FEES examination**

*Competency 1: Preparation of patient*

3.1.1 Ability to comprehensively explain the FEES procedure, its rationale and risks.

3.1.2 Knowledge of organisational requirements in relation to obtaining patient consent.

3.1.3 Preparation of the environment, equipment, patient and team in readiness for procedure

3.1.4 Application of topical anaesthetic when clinically appropriate and in accordance with organisational guidelines

*Competency 2: FEES set up in preparation for specific patient*

3.2.1 Ability to prepare environment and equipment for FEES procedure

3.2.2. Knowledge of food and fluid consistencies as appropriate to patient for swallowing assessment.

3.2.3 Ability to ensure appropriate patient positioning for FEES procedure.

*Competency 3: Ability to perform a comprehensive FEES assessment using a site specific formal protocol.*

3.3.1 Demonstrate understanding of the key aspects of a FEES assessment.

3.3.2 Ability to perform FEES examinations with a variety of patient aetiologies and settings.

3.3.3 Ability to lead the patient through the FEES procedure

3.3.4 Selects appropriate materials, quantities and delivery method to be swallowed based on patient presentation

3.3.5 Recognises abnormal anatomy/physiology associated with swallowing dysfunction

3.3.6 Identifies swallowing abnormalities
3.3.7 Selects manoeuvres, strategies as appropriate for individual patient presentation and uses biofeedback for patient learning as needed.

3.3.8 Knowledge of FEES as a biofeedback tool

**Competency 3: Optimising patient safety through accurate identification and management of patient related factors.**

3.4.1. Ability to identify and effectively manage patient related factors that may influence the undertaking of FEES examination (anatomical, physical, and emotional).

3.4.2 Ability to recognise when to discontinue FEES procedure due to patient related factors.

**Recommended Reading**

Hapner ER. *Training and Interpretation of FEES in adults – DVD*. Plural Publishing

**Speech Pathology Australia**

Speech Pathology Australia (SPA) outlines broad competencies relevant to the performance and interpretation of FEES, including:

- Knowledge of normal and abnormal aerodigestive physiology for respiration, airway protection and swallowing
- Recognition of anatomical landmarks as viewed with an endoscope
- Recognition of altered anatomy as it relates to swallowing function
- Performance and demonstrated specific knowledge of the elements of a comprehensive FEES protocol
- Identification of salient findings during a FEES
- Interpretation of the results from a FEES to develop an appropriate management plan


**The American Speech-Language-Hearing Association**

The American Speech-Language-Hearing Association (ASHA) suggests a FEES training curriculum which includes aspects pertaining to procedure and interpretation. ASHA suggests specific items for evaluation under various broad headings, including:

- Evaluation of anatomy of the aerodigestive system
- Evaluation of the physiology of the aerodigestive system
- Anatomical abnormalities
- Neurogenic vs mechanical disruption
- Interpretation of salient findings in terms of underlying deficits

As examples of specific items, those included under the broad heading of "Interpretation of salient findings in terms of underlying deficits" are:

- Anatomical/structural deviations
- Movement deviations
- Sensory deficits
- Specifics of swallowing function/dysfunction
- Interpretative assessment of swallowing safety


**Royal College of Speech and Language Therapists, United Kingdom**

The Royal College of Speech and Language Therapists (RCSLT) outlines the FEES procedure by way of a FEES protocol covering the following areas:

- Part A – examination of anatomy and physiology via the categories of velopharyngeal competency, pharynx, larynx and supraglottis, laryngopharyngeal sensation, and secretions. Tasks are described to assess each category.
- Part B - bolus presentation, and elements to look out for eg. amount and location of premature spillage.
- Part C - effectiveness of therapeutic interventions.
- Part D - use of biofeedback.

Successful FEES interpretation is implied having completed the proposed training program ie. successful performance and interpretation of 20 F.E.E.S under direct supervision.


Additional:
Interpretative aspects includes ability to understand the images viewed, knowledge of the physiology behind the swallowing outcomes observed, and identification and evaluation of efficacy of swallowing manoeuvres trialled. This information is then analysed to inform the swallow management plan and provide patient education and feedback.

The interpretation knowledge and skills required for competency are summarized to include:

- The understanding of anatomy and physiology of the aero digestive tract as pertains to swallowing function
- Knowledge of normal and disordered anatomy and physiology via nasendoscope
- Recognise altered anatomy as it relates to swallowing function
- Identification of salient finding during on-line FEES assessment with decision making responsive to findings
- Use of treatment strategies to facilitate optimal swallowing function
- Determine an appropriate management plan

Method of attainment of skills

- Direct observation of experienced FEES clinician as per competencies
- Graded participation in FEES procedures with supervision with experienced FEES clinician
- Supervisor to ensure exposure to a breadth of patient presentation
- Complete recommended readings/DVD/CD.
- Discussion with other professionals after procedure e.g. medical, nursing, allied health.
- Completion of patient and family education regarding FEES results and management plan.

SECTION 4: Interpretation and Reporting of the FEES Examination

**Competency 1: Interpreting Results and Reporting of Endoscopic Assessment of Swallow Function**

4.1.1 Able to summarise key findings of examination using formal protocol as per local guidelines

4.1.2 Able to interpret results of examination and communicate results of FEES assessment

4.1.3 Recognises need for appropriate additional examinations

4.1.4 Determines need for treatment strategies and swallowing rehabilitation

**Competency 1: Documentation of FEES findings**

4.2.1 Demonstrated awareness of minimum reporting standards.

4.2.2 Dissemination of FEES reports as appropriate.

**Recommended readings**

Hapner ER. *Training and Interpretation of FEES in adults – DVD*. Plural Publishing


**Additional resources:**

Example of FEES
http://www.youtube.com/watch?v=0esbw165NTg

LPR and pooling of secretions
http://www.youtube.com/watch?v=iuBR5fX0pAc
Section 5 Core Competencies: Maintenance of Skill

Ongoing maintenance is achieved by:

1. Technical Skill
   • performing minimum 10 scopes/year, including 2 under direct medical supervision.

2. Procedural and Interpretive Skill
   • conducting 2 supervised FEES annually signed by supervisor.

3. Maintaining signed and dated log records to meet departmental/Local Health Network Credentialing requirements.

SECTION 5: Maintenance of Skill

Competency 1: Complete FEES Examinations

5.1.1 Submission of technical record for nasendoscopy

5.1.2 Submission of record of procedural and interpretive components of FEES examinations

Competency 2: Maintenance of Mandatory Training Requirements

5.2.1 To complete site specific mandatory training needs

Competency 3: Attendance in professional development activities and sharing knowledge and skills with others

5.3.1 Commitment to ongoing learning and current evidence based practice in dysphagia and FEES
Section 6 Core Competencies: Competency following extended leave

For credentialed staff returning from a break in clinical practice (e.g., maternity leave, extended leave) of greater than 3 months and less than/including 12 months, the following is required:

- 2 supervised scopes under direct medical supervision.
- Credentialed supervisor supervision of 2 FEES (procedural and interpretive competencies)
- Once these are completed the clinician is credentialed to conduct FEES independently. The accrued number of scopes may be included in their annual maintenance requirement of 10 scopes.

For credentialed staff returning from break in clinical practice of greater than 12 months

- Enter a negotiated period of orientation as required by individual institutions, including a minimum of 10 supervised scopes (2 under direct medical supervision)
- Credentialed supervisor supervision of 2 FEES (procedural and interpretive competencies)

SECTION 6: Competency following extended leave

*Competency 1: Complete FEES examinations*

6.1.1 Knowledge of current imaging equipment

6.1.2 Complete 10 FEES procedures under direct supervision by a credentialed speech pathologist for the procedural, interpretive and reporting components of FEES

6.1.3 Complete 2 FEES procedures under direct medical supervision for credentialing of the technical component of FEES

6.1.4 Complete mandatory training requirements

*Competency 2: Knowledge of FEES policies and procedures*

6.2.1 Awareness of any changes to FEES Clinical Guidelines, local policy and procedure
For staff currently credentialed under another organization
  o A negotiated period of orientation as required by individual institution, and a including a minimum of 2 supervised scopes under direct medical supervision and credentialed supervisor supervision of 2 FEES (technical, procedural and interpretive competencies)

SECTION 7: Recognition of Competency between Organisations

**Competency 1: Evidence of previous satisfactory completion of training**

7.1.1 Previous FEES training

**Competency 2: Training in local FEES policies and procedures**

7.2.1 Knowledge of FEES imaging equipment

7.2.2 Knowledge of local FEES clinical guidelines and relevant position papers and documents.

7.2.3 Complete 2 FEES procedures under direct supervision by local credentialed FEES clinician and/or medical officer.

7.2.4 Complete mandatory training requirements
**Appendix A: Fiberoptic Endoscopic Evaluation of Swallowing**

**Record of Clinical Practice**

**Maintenance record for previously credentialed speech pathologists**

 Organisation: .................................................................................................................................

 Staff Name: .................................................................................................................................

Procedures (Minimum 10 per year)

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<tr>
<th>Date of Procedure</th>
<th>UR Number</th>
<th>Technical Scope Passed</th>
<th>Procedural &amp; Interpretation Completed</th>
<th>Counter Sign &amp; Position</th>
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Medical officer supervision of Nasendoscopic insertion (2 required per year)

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<th>UR Number</th>
<th>Technical competency</th>
<th>Procedural &amp; Interpretation Completed</th>
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Peer evaluation of FEES (2 required per year)

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<th>Procedural &amp; interpretative competency (see checklist)</th>
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## Training record for non-credentialed speech pathologists

Organisation:........................................................................................................................................................................
Staff Name:..............................................................................................................................................................................

### Procedures (Minimum 20)

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### Medical officer supervision of Nasendoscopy insertion (2 required per year)

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### Peer evaluation of FEES (2 required per year)

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Return to work record for previously credentialed speech pathologists

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Staff Name: ........................................................................................................................................................

Procedures (Minimum 10 per year)

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Peer evaluation of FEES (2 required per year)

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Initial Credentialing of Speech Pathologists – Formal Sign off of competency

Name: 
Position: 
Organisation: 
Employee Number: 
Date of application: 

Procedural Competency

Competency training in the Procedural component of FEES has been completed under the supervision and training of (insert credentialed and experienced Speech Pathologist’s name or clinical sponsor/medical officer name) at (insert facility name). The training log must be sighted to confirm completion of 20 procedures with under supervision inclusive of 2 FEES procedures.

Training log sighted □
Date of Verification of Procedural skill: 
Name: Signed:

Interpretation

Competency training in the Interpretation component of FEES has been completed under the supervision and training of (insert credentialed and experienced Speech Pathologist’s name or medical officer name) at (insert facility name). The training log must be sighted to confirm completion of 20 procedures under supervision inclusive of 2 FEES procedures.

Training log sighted □
Date of Verification of Interpretation skill: 
Name: Signed:

Technical Competency

Competency training in the use of endoscopy has been completed under the supervision and training of (insert clinical sponsor name and speciality eg. John Smith, ENT surgeon) at (insert facility name). The training log must be sighted to confirm completion of 20 procedures with demonstrated competency under supervision inclusive of 2 FEES procedures with the final two assessed by the clinical sponsor.

Training log sighted □
Date of Verification of Technical skill: 
Name: Signed:

(Clinical Sponsor ONLY)

FEES Competency Training Completion

Training FEES Speech Pathologist: Date: 
Director/Manager/Senior Speech Pathology: Date: 

SA Acute Hospital Program for Credentialing Speech Pathologists in the Extended and Advanced Practice Role of Independent Fibreoptic Endoscopic Evaluation of Swallowing (2016)
Appendix B: literature review

FEES literature and background information at time of development of the original South Australian Guidelines Document

Indications/contraindications for using FEES

FEES is used for evaluating swallowing physiology and aspiration to determine suitability for oral intake and to guide swallowing therapy. Speech and non-speech physiology can be examined prior to the introduction of oral intake to identify anatomical/physiological abnormalities which may impact swallowing function and guide the types of food/fluid and method of feeding to reduce the likelihood of aspiration. The FEES equipment is portable enabling examination to be completed at the bedside for patients who are immobile, medically unstable or difficult to manoeuvre (Langmore, Schatz & Olsen, 1988; Wilson, Hoare & Johnson, 1992, Kidder, Langmore & Martin, 1994). Unlike the modified barium swallow (MBS) examination, which is time limited by radiation exposure, there is no time limitation imposed on FEES apart from patient tolerance. The lack of exposure to radiation also means that FEES can be repeated more frequently to monitor progress or guide therapy (Denk et al 1997; Langmore, 2001). FEES is of lower cost than modified barium swallow and requires fewer staff to perform the examination (Ajemian et al, 2001).

FEES has been shown to be superior to MBS examination for the evaluation of secretions, including salivary aspiration, which is poorly visualised on MBS (Murray, 1999). It also allows examination of pharyngolaryngeal sensitivity (Langmore, Schatz & Olsen, 1988) and clear evaluation of airway protection mechanisms in patients with dysphonia. (Kidder, Langmore & Martin, 1994).

FEES is a safe method for providing biofeedback to patients during swallowing therapy, reducing the time taken to teach swallowing manoeuvres and improving the accuracy in the way they are performed (Denk & Kaider, 1997; Langmore, 2001; Murray, 1999).

FEES is becoming the assessment of choice for swallowing evaluation of immobile patients post endotracheal intubation in ICU, who have a high incidence of dysphagia including silent aspiration. In a study of FEES examinations on 48 consecutive surgical and medical ICU patients with a minimum of 48 hours of intubation for mechanical ventilation, 56% had aspiration on thin and/or thick materials and 25% silent aspiration (Ajemian et al, 2001).

Practical reasons for choosing FEES instead of MBS

- Patient is bedridden and/or unable to be safely positioned for MBS
- Patient is quadriplegic or severely hemiplegic
- Patient has cardiac or other monitors
- Patient is in ICU
- Patient is on a ventilator
- Examination is required urgently
- A repeat examination is required to assess change (e.g. possible diet change)
- There is no exposure to exposure
- It provides a therapeutic tool for biofeedback, teaching and/or assessing effectiveness of posture or manoeuvre
- Swallowing potential can be assessed without needing to give food or fluid orally due to high risk of aspiration
- It is more cost effective than MBS
Clinical reasons for choosing FEES instead of MBS

- Airway protection is at risk because of dysphonia, history of intubation, or possible of vocal fold paresis
- Assessment of secretion management is needed
- Pharyngeal swallowing dysfunction is suspected and the patient's potential for taking any food or fluid orally is queried (e.g. after brainstem CVA or after prolonged period without oral intake)
- Impaired pharyngeal/laryngeal sensitivity is suspected and needs to be directly assessed
- Increased residue over several swallows is suspected possibly leading to aspiration
- Impaired coordination of breathing and swallowing is suspected (e.g. chronic obstructive pulmonary disease)
- Ability to adduct true vocal folds needs to be determined in relation to learning protective swallowing manoeuvres
- Ability to sustain adduction of true vocal folds for several seconds needs to be determined for airway protection
- Fatigue over a meal is suspected, possibly leading to aspiration
- Altered anatomy is suspected as contributing to the dysphagia

Indications for MBS instead of FEES

- Poor tolerance of nasendoscope
- Suspected oral stage problem that requires imaging
- Suspected oesophageal stage problem or gastro-oesophageal reflux disease (GORD)
- Symptoms of globus pharyngeus e.g. cricopharyngeal dysfunction, osteophytes
- Vague symptomatology from patient: requiring comprehensive view
- Identification of physiological/structural variables contributing to dysphagia
- Verification required of aspiration of thin liquids during the swallow
- Quantification required of degree of aspiration

Adapted from:


Contraindications: FEES does not adequately assess the oral phase and would not be the assessment of choice with patients with primarily oral phase difficulties (Bastian, 1991). FEES is not the assessment of choice for patients who may have a contributing oesophageal component to their dysphagia (although reflux may be visualised during the procedure).

FEES may be contraindicated in the following circumstances (ASHA, 2002):

- Patient is not sufficiently alert to be fed orally
- Patient has severe nasal or pharyngeal stenosis
- Patient is agitated and/or combative
- Patient has movement disorder of sufficient severity to preclude safe completion of examination by nasendoscopy
- Patient has a history of epistaxis
- Patient has a bleeding disorder
- Patient has an acute cardiac condition that predisposes him/her to cardiac arrhythmias
Knowledge of the validity of FEES

The following is provided as a review of the current literature regarding this competency

FEES has been shown to be more reliable than clinical examination. In a study of 49 first time stroke patients comparing clinical examination with FEES, the clinical examination was found to underestimate aspiration in patients with aspiration (false negative rate of aspiration risk of 14%) and overestimate aspiration in patients who did not aspirate (false positive rate of 70%). The clinical examination had an 86% sensitivity (probability of there being clinical signs of aspiration when there is actually aspiration occurring) for aspiration risk, 30% specificity (probability of there not being clinical signs of aspiration when there is truly no aspiration occurring) [Leder & Espinosa, 2002]. It has been recommended that FEES is a “…reliable, timely, and cost-effective instrumental swallow evaluation…” (Leder & Espinosa, 2002:214) for patients in the immediate post-stroke period which may result in more timely return to oral intake and reduced risk of aspiration.

In a comparison of fluorography and endoscopy, FEES was found to be more useful than barium swallow examination when evaluating velo-pharyngeal mobility, pharyngeal squeeze, vocal fold mobility, pharyngolaryngeal sensation, anatomic detail and pooling (Bastian, 1991). Barium swallow was found to be superior when assessing aspiration (aspiration is seen after the event in FEES when the period of "whiteout" has passed), swallow latency, swallow duration and laryngeal elevation (Bastian, 1991).

FEES is more reliable for identification of observed (aspiration before the swallow) rather than inferred findings (laryngeal elevation).

FEES has been compared with modified barium swallow, the "gold standard" for swallowing evaluation. It was found to be a reliable procedure for detecting pharyngeal swallowing problems. In studies comparing fluorography with nasendoscopy, there is approximately 85% agreement on identification of laryngeal penetration, 80% agreement regarding pharyngeal residue and between 82-96% agreement on detection of aspiration (Langmore, Shatz & Olsen, 1991; Wu et al, 1997; Perie et al, 1998). FEES is less sensitive in detecting premature spillage than modified barium swallow (Langmore, Shatz & Olsen, 1991). The positive and negative predictive values of FEES, the ability of FEES to predict findings found on MBS were high at ≥ 0.70 for residue, penetration, premature spillage (Langmore, Shatz & Olsen, 1991) and aspiration (Langmore, Shatz & Olsen, 1991; Perie et al, 1998). In a study of 34 dysphagic patients, identical findings of pharyngeal propulsion problems were found in 82% of cases when FEES was compared with pharyngeal manometry (Perie et al, 1998).

Knowledge of risks associated with procedure and management of adverse events

The following is provided as a review of the current literature regarding this competency

There are proposed risks in performing FEES examinations but there have been no reported major adverse events.

FEES should only be performed in an environment where access to emergency assistance is available eg MET call response team.

Organisation emergency procedures should be followed in the case of an adverse event.

Incidents are to be reported as per organisational procedure.

Each organisation should ensure adequate training in the management of adverse reactions as well as appropriate monitoring should the incidence be abnormally high.
Potential complications include:

- Allergic reaction to lidocaine and epinephrine
- Epistaxis (nose bleed)
- Laryngospasm
- Vasovagal response (fainting)
- Patient discomfort

**Epistaxis**

Risk of epistaxis is low. In a trial of 500 patients undergoing F.E.E.S.S.T (Flexible Endoscopic Evaluation of Swallowing with Sensory Testing), 3 (0.6%) had self-limiting epistaxis (Aviv et al, 2000). This sample included patients post-stroke who were on anticoagulation therapy. The risk of epistaxis may even be lower when decongestants and lubricants are used (Kidder, Langmore & Martin, 1994) but there are other potential complications when these are used. The risk of epistaxis is increased if the patient is on anticoagulants such as warfarin, heparin and onexparin at prophylactic or therapeutic doses.

**Laryngospasm and vasovagal response**

There have been no reports in the journal literature of complications during FEES, or when using nasendoscopy during voice assessment. However there are sound theoretical reasons why such complications should be considered and resuscitation equipment needs to be readily available.

A nasocardiopulmonary reflex may be triggered due to stimulation of the nose and stimulation of the vagal afferents in the pharynx and larynx may potentially result in hypotension (low blood pressure), bradycardia (slow heart rate) or cardiac arrhythmia (Kidder, Langmore & Martin, 1994). In a study of 500 patients undergoing F.E.E.S.S.T., there was no significant difference in pre and post-examination heart rate (Aviv et al, 2000). Using a topical anaesthetic in the nose will abolish the nasocardiopulmonary reflex but this has potential adverse effects (see 4.1). It is important not to anaesthetise the larynx as this will potentially alter the results of the study so care should be taken when examining the larynx in patients in whom normal sensitivity is presumed (ie. normal cough response to pooled secretions or aspiration are observed).

Laryngospasm can occur in response to stimulation of the endolaryngeal mucosa by a foreign body resulting in a "...reflexive, spastic, and sometimes prolonged closure of the glottic and supraglottic sphincters." (Kidder, Langmore & Martin, 1994:259). Laryngospasm should not occur in an awake patient unless there is prolonged manipulation of the true vocal folds (Wyke, 1968; Murakami & Kirchner cited, in Aviv et al, 2000). Laryngospasm usually relaxes spontaneously but may require positive airway pressure to release and as such is a potentially serious complication when performing FEES. In a study assessing the safety of Functional Endoscopic Evaluation & Sensory Testing (FEEST), where measured air pulses are directed to the mucosa of the laryngopharynx to elicit a laryngeal adductor reflex, there were no incidents of laryngospasm or vasovagal response in 500 patients with dysphagia (mainly of neurological origin (Aviv et al, 2000). Cohen et al (2003) concluded in their study of 305 patients, that flexible nasendoscopic evaluation of swallowing with sensory testing is a safe, well tolerated procedure to objectively evaluate dysphagia.

**Patient comfort**

The risks of major complication can be reduced by excluding the use of topical anaesthetic and vasoconstrictors. A prospective, double-blind, randomised study of 152 patients found no difference in patient comfort rating when using a vasoconstrictor, a topical anaesthetic or placebo with most patients rating their experience during the procedure as "mild" or "moderate discomfort" (Leder et al, 1997). A further sample of 50 patients received no substance and reported similar comfort ratings. It was concluded from this study "...that speech-language pathologists can perform independent and comfortable transnasal endoscopy without administration of any substance to the nasal mucosa" (p.
A study of 60 patients comparing the use of anaesthetic (5% cocaine) with normal saline in each nostril found no difference in pain or gag scores (Singh, Brockbank & Todd, 1997).

It is recommended that in most patients, topical anaesthetic and vasoconstrictors are unnecessary for the safe and comfortable nasendoscopy for F.E.E.S. (Aviv et al, 2000; Langmore, Schatz & Olsen, 1988, 1991; Leder et al 1997; Singh, Brockbank & Todd, 1997). Avoiding topical anaesthetic is advantageous as normal pharyngeal and laryngeal sensation is maintained for the swallow examination.

It has also been reported that patients are very susceptible to the suggestion of the examiner during the procedure and when the examiner was less apprehensive about the procedure, patients “…adopted the same attitude.” (White & Knight, 1984: p1167).

Knowledge of nasal, oral, pharyngeal, laryngeal and oesophageal anatomy including altered anatomy as it relates to swallow function

The following is a guide to assist clinicians through the areas of knowledge needed to understand the endoscopic view as it relates to swallowing and dysphagia.

Anatomy:
1. nasal passage
2. palate and nasopharynx
3. oral cavity and tongue base
4. hypopharynx
5. larynx
6. subglottis
7. upper oesophageal sphincter
8. oesophagus
9. anatomical protections against aspiration

Variance of normal anatomy may include:
- Nasal stenosis
- Velopharyngeal incompetency
- Palatal cleft
- Pharyngeal stenosis
- Post surgical presentation
- Mucosal change (post radiation, disease)
- Pharyngeal/laryngeal lesions
- Edema/erythema
- Indirect evidence of gastro-oesophageal reflux
- Vocal fold impairment


This competency can be achieved via tutorial, practical training and text book study and recordings of FEES/laryngeal examinations.
**Knowledge of aero digestive physiology and neurological innervation**

**Physiology of the aero digestive system includes**
- Oral function
- Movement of the tongue base
- Epiglottic inversion
- Velopharyngeal competence
- Pharyngeal wall movement
- Laryngeal movements
- Oesophageal function
- Sensory function

**Neurological vs mechanical disruption**
- Characteristics of movement dysfunction
- Unilateral vs bilateral deficits
- Post surgical disruption
- Congenital birth defects
- Normal ageing
- Tracheostomy and ventilator issues.


This competency can be achieved via tutorial, practical training, text book study and study of recordings of FEES/laryngeal examinations.

**Knowledge of the use of anaesthetics**

*The following is provided as a review of the literature regarding this competency*

Risks associated with the application of topical anaesthetic are rare (Australian Medicines Handbook, 2002; Kidder, Langmore & Martin, 1994; White & Knight, 1984) but anaphylaxis and fatalities have been reported (Ritchie & Greene, cited in Leder et al, 1997), specifically with topical application of tetracaine (Adriani & Campbell, 1956). However, it has been determined that the use of topical anaesthetics is not necessary to ensure patient comfort. Permission for the application of topical anaesthetic use by speech pathologists will be organisation specific and appropriate guidelines and training will be required.

This would include:
1. anaesthetic drugs
2. pharmacological effects of anaesthetics
3. dosage and side effects
4. indications/contraindications

**Knowledge of patient consent**

Guidelines for consenting patients for FEES are organisational specific and informed by organisational policies and procedures.
Knowledge of infection control and standard precautions

This includes:

- Standard precautions
- General patient and clinician safety
- High level disinfection

This competency will be achieved by tutorial, reading of organisational policies.

Knowledge of use of F.E.E.S for biofeedback

When used for biofeedback/therapy, FEES tasks are designed around a patient’s specific intervention program.
## Appendix C: FEES Competencies

### SECTION 1: Experience, Skill and Theoretical Knowledge

#### Competency 1: Relevant Pre-Requisite Experience

<table>
<thead>
<tr>
<th>Experience, Knowledge and Skill</th>
<th>Performance Criteria</th>
<th>Assessment Process</th>
<th>Date Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1 Meets professional membership requirements and state Allied Health credentialing</td>
<td>Eligible for membership of SPA</td>
<td>Confirmed by Director/Manager with documentation of CV, qualifications, credentialing status and annual performance review.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Credentialing information is current on state register.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.2 General clinical experience in health settings.</td>
<td>Minimum 3 years relevant clinical experience</td>
<td>Confirmed by Director/Manager with documentation of CV, qualifications, credentialing status and annual performance review.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minimum AHP2 classification</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eligible for membership SPA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current credentialing registration on state register</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.3 General Dysphagia clinical experience including observation of minimum 5 FEES procedures</td>
<td>Demonstrated competency in independent clinical dysphagia assessment and management.</td>
<td>Confirmed by supervisor or Director/Manager.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current and regularly updated skills in, and knowledge of dysphagia</td>
<td>Evidence of participation in case discussions, attendance at interest group meetings, records of reading, PSR (SPA) etc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regular reading of relevant texts, articles.</td>
<td>Discussion of FEES procedure/findings with credentialed speech pathologist</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attendance at interest groups, workshops, case presentations etc</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Observe 5 FEES procedures for dysphagic patients.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.4 Competence in organisation mandatory training including basic life support training and infection control</td>
<td>Completion of training.</td>
<td>Completion of organisational mandatory training requirements.</td>
<td></td>
</tr>
</tbody>
</table>
### Competency 2: Advanced dysphagia knowledge and experience

<table>
<thead>
<tr>
<th><strong>1.2.1</strong> Advanced clinical knowledge of medical terminology for respiration, airway protection and swallowing</th>
<th>Dysphagia reporting reflects appropriate understanding and terminology</th>
<th>Confirmed by supervisor and/or manager</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.2.2</strong> Advanced clinical knowledge of principles and techniques of swallowing assessment and therapy</td>
<td>Clinical discussion</td>
<td>Completion of tutorial presentation with supervisor feedback</td>
</tr>
<tr>
<td><strong>1.2.3</strong> Knowledge of swallowing changes across the lifespan.</td>
<td>Recognition of age and development in clinical assessment and documentation</td>
<td>Confirmed by supervisor and/or manager</td>
</tr>
<tr>
<td><strong>1.2.4</strong> Advanced practice dysphagia assessment skills including MBS</td>
<td>Successful completion of MBS competency training. Experience conducting MBS assessments over previous 12 months. Supervisor/supervisor review of MBS assessment and documentation</td>
<td>MBS Competency training signed-off by supervisor and/or manager. Evidence of completed MBS assessments</td>
</tr>
<tr>
<td><strong>1.2.5</strong> Knowledge of indications and contraindications and validity for different instrumental evaluations including MBS and FEES.</td>
<td>Clinical discussion</td>
<td>Completion of tutorial presentation with supervisor feedback</td>
</tr>
<tr>
<td><strong>1.2.6</strong> Ability to integrate knowledge of FEES to select suitable patients and support colleagues to recognise potential candidates for FEES</td>
<td>Verbally discuss potential FEES candidates with other colleagues. Able to inform colleagues of suitability for FEES.</td>
<td>Confirmed by supervisor and/or manager</td>
</tr>
<tr>
<td><strong>1.2.7</strong> Demonstrate knowledge of patient populations where FEES may be particularly beneficial or advantageous.</td>
<td>Discuss specific groups assessed from local contexts or be regular users of FEES clinics. Recognise clinical caseloads/areas that may benefit from FEES and may require education to promote FEES.</td>
<td>Completion of required readings. Tutorial discussion with supervisor.</td>
</tr>
<tr>
<td><strong>1.2.8</strong> Demonstrate ability to triage referrals and prioritise patients as needed.</td>
<td>Evaluate referrals based on: - Acute vs post/acute or chronic dysphagia - Referral information - Specific factors related to the dysphagia</td>
<td>Discussion with supervisor.</td>
</tr>
<tr>
<td><strong>1.2.9</strong> Knowledge of professional, local, site, regional and national dysphagia policies, position papers, credentialing requirements.</td>
<td>Be able to verbally explain the rationale for triage decision.</td>
<td>Completion of relevant Infection Control training. Knowledge of equipment manufacturer’s instructions. Completion of mandatory training requirements.</td>
</tr>
</tbody>
</table>

**Competency 3: Advanced Knowledge of Aero digestive Anatomy and Physiology**

| **1.3.1** Knowledge of normal aero digestive anatomy including nasal, oral, pharyngeal, laryngeal and oesophageal structures. | Supervised participation in F.E.E.S. / Voice Clinic assessments. Demonstrated knowledge in discussion with supervisor. and/or Analysis and interpretation of pre-recorded F.E.E.S. assessments. | Confirmed by supervisor and/or manager |

| **1.3.2** Knowledge of altered (abnormal/post-surgical) aero digestive anatomy including nasal, oral, pharyngeal, laryngeal and oesophageal anatomy as it relates to administering FEES including indications and contraindications | Supervised participation in F.E.E.S. / Voice Clinic assessments. Demonstrated knowledge in discussion with supervisor. and/or Analysis and interpretation of pre-recorded F.E.E.S. assessments. | Confirmed by supervisor and/or manager |

| **1.3.3** Knowledge of normal aero digestive physiology and neurological innervation as it relates airway protection and swallowing | Supervised participation in F.E.E.S. / Voice Clinic assessments. Demonstrated knowledge in discussion with supervisor. and/or Analysis and interpretation of pre-recorded F.E.E.S. assessments. | Confirmed by supervisor and/or manager |

<p>| <strong>1.3.4</strong> Knowledge of altered aero digestive physiology and neurological innervation and its impact on airway protection and swallowing. | Supervised participation in F.E.E.S. / Voice Clinic assessments. Demonstrated knowledge in discussion with supervisor. And/or Analysis and interpretation of pre-recorded F.E.E.S. assessments. | Confirmed by supervisor and/or manager |</p>
<table>
<thead>
<tr>
<th>Competency 4: Safety and Risk Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4.1 Knowledge of anaesthetics</td>
</tr>
</tbody>
</table>
| 1.4.2 Knowledge of risks, adverse events and emergency management | Demonstrated knowledge of relevant first aid (Speech Pathology management)  
Knowledge of Code procedures  
Knowledge of emergency equipment location and use | Completion of organisational mandatory training requirements |
| 1.4.3 Knowledge of infection control and standard precautions | Organisational training in infection control/hand hygiene/PPE.  
Completion of organisational scope cleaning competencies.  
Knowledge of management of patients with multi-resistant infection, including equipment cleaning requirements. | Completion of organisational mandatory training requirements |
| 1.4.4 Current basic life support training | Annual training in basic life support including CPR and choking management. | Completion of organisational mandatory training requirements |
| 1.4.5 Knowledge of patient consent | Knowledge of EQuiP Criteria  
Use of organisational forms for consent | Confirmed by supervisor and/or manager |
## SECTION 2: Technical Aspect of FEES

### Competency 1: Knowledge of Equipment

<table>
<thead>
<tr>
<th>Experience, Knowledge and Skill</th>
<th>Performance Criteria</th>
<th>Assessment Process</th>
<th>Date Achieved</th>
</tr>
</thead>
</table>
| **2.1.1 Knowledge of facility specific imaging equipment and specific nasendoscopes including safe and effective operation and maintenance of the equipment in accordance with manufacturer's instructions** | Can verbally describe components of equipment including  
- flexible nasendoscope including different types  
- light source & white balancing  
- camera head & processor  
- microphone  
- recording system and database management  
- consumables  
- trial foods/fluids  
Demonstrates ability to set up and operate facility imaging equipment including recording system for both still images and video equipment, and database management | Review of local facility equipment manual or guidelines  
Discussion with supervisor  
Observation of medical or Speech pathology staff completing nasendoscopy  
Direct observation of equipment set up | Independently sets up equipment |

| **2.1.2 Knowledge of facility specific infection control guidelines and universal precautions for nasendoscopes.** | Can describe and demonstrate infection control procedures for nasendoscope:  
- cleaning pre and post assessment  
- delivery of nasendoscope to nominated personnel or location/area  
- inspection of nasendoscope to detect structural defect  
- leak testing  
- cleaning/decontamination of nasendoscope immediately after use  
- facility requirement for sterilisation or high level disinfection | Familiarisation with current regional and facility specific guidelines and operational work procedures.  
Tutorial training session  
Supervisor assessment of adherence to guidelines as appropriate | |

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SA Acute Hospital Program for Credentialing Speech Pathologists in the Extended and Advanced Practice Role of Independent Fibreoptic Endoscopic Evaluation of Swallowing (2016)
<table>
<thead>
<tr>
<th>Competency 2: Insertion of Nasendoscope</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.1 Knowledge of anatomy of the nose, pharynx and larynx as related to</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>nasendoscopy procedure</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 2.2.2 Knowledge of atypical nasal anatomy and implications for passing scope           | Recognise atypical (abnormal) nasal anatomy that may reduce ability to pass nasendoscope comfortably for patient                                                                                                                                                                                                                                           | Completion of appropriate readings  
Direct observation of FEES procedure  
Supervisor assessment  
Observation of medical staff/FEES clinician performing nasendoscopy |
| 2.2.3 Ability to insert and manoeuvre and remove the nasendoscope through the nasal passage in a manner that minimises adverse reactions and patient discomfort | Demonstrate knowledge of strategies to assist successful passing of nasendoscope through the nasal passage, pharynx and larynx  
Demonstrate ability to utilise information and strategies to determine which nare most appropriate for nasendoscope passage | Completion of appropriate readings  
Direct observation of FEES procedure  
Supervisor assessment  
Observation of medical staff performing nasendoscopy |
| 2.2.4 Ability to manipulate the nasendoscope in the pharynx to obtain optimal view of the velopharynx, oropharynx, hypopharynx, larynx during the swallowing examination | Demonstrate ability to negotiate velopharyngeal port for view of oro-pharynx  
Demonstrate ability to move nasendoscope through oropharynx to view structures of pharynx and larynx  
Demonstrate ability to negotiate pharynx and larynx for view of pharyngeal and laryngeal structures during assessment tasks (as per site specific protocol)  
Demonstrated ability to position effectively for goals of procedures | Completion of appropriate readings  
Direct observation of FEES procedure  
Supervisor assessment of information provision FEES  
Observation of medical staff/FEES clinician performing nasendoscopy |

**Competency 3: Health and Safety Performance of FEES within a risk management framework**

| Knowledge of anatomy of the nose, pharynx and larynx as related to nasendoscopy procedure | Accurately recognise structures of the nasal passage, pharynx, and larynx as seen endoscopically | Completion of appropriate readings  
Direct observation of FEES procedure  
Supervisor assessment |
| Knowledge of atypical nasal anatomy | Recognise atypical (abnormal) nasal anatomy that may reduce ability to pass nasendoscope comfortably for patient | Completion of appropriate readings |
| Competency 3: Health and Safety Performance of FEES within a risk management framework |
|---------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|
| **2.3.1 Completed mandatory training in cardio-pulmonary resuscitation as required by the organisation on an annual basis.** | **Has demonstrated completion of mandatory training (site specific)** | **Completion of appropriate readings** | **Completion of mandatory training** |

<table>
<thead>
<tr>
<th>anatomy and implications for passing scope</th>
<th>reduce ability to pass nasendoscope comfortably for patient</th>
<th>Direct observation of FEES procedure Supervisor assessment Observation of medical staff/FEES clinician</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.3 Ability to insert and manoeuvre and remove the nasendoscope through the nasal passage in a manner that minimises adverse reactions and patient discomfort</td>
<td>Demonstrate knowledge of strategies to assist successful passing of nasendoscope through the nasal passage, pharynx and larynx</td>
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</tr>
</tbody>
</table>

| Competency 3: Health and Safety Performance of FEES within a risk management framework |
|---------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|
| **2.3.1 Completed mandatory training in cardio-pulmonary resuscitation as required by the organisation on an annual basis.** | **Has demonstrated completion of mandatory training (site specific)** | **Completion of appropriate readings** | **Completion of mandatory training** |

| Competency 3: Health and Safety Performance of FEES within a risk management framework |
|---------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|
| **2.3.1 Completed mandatory training in cardio-pulmonary resuscitation as required by the organisation on an annual basis.** | **Has demonstrated completion of mandatory training (site specific)** | **Completion of appropriate readings** | **Completion of mandatory training** |

| Competency 3: Health and Safety Performance of FEES within a risk management framework |
|---------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|
| **2.3.1 Completed mandatory training in cardio-pulmonary resuscitation as required by the organisation on an annual basis.** | **Has demonstrated completion of mandatory training (site specific)** | **Completion of appropriate readings** | **Completion of mandatory training** |

<p>| Competency 3: Health and Safety Performance of FEES within a risk management framework |
|---------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|
| <strong>2.3.1 Completed mandatory training in cardio-pulmonary resuscitation as required by the organisation on an annual basis.</strong> | <strong>Has demonstrated completion of mandatory training (site specific)</strong> | <strong>Completion of appropriate readings</strong> | <strong>Completion of mandatory training</strong> |</p>
<table>
<thead>
<tr>
<th>2.3.2 Completed mandatory training in infection control and standard patient specific precautions as required by the organisation on an annual basis for safe environment and practice for FEES procedures.</th>
<th>Has read organisational policies and completed annual/mandatory training in standard precautions, management of MRO’s, hand hygiene. Knowledge of ward specific infection control policies as needed eg HDU, ICU.</th>
<th>Familiarisation with current regional and facility specific guidelines and operational work procedures. Tutorial training session Supervisor assessment of adherence to guidelines as appropriate Completion of appropriate mandatory training i.e. hand hygiene, BLS, infection control, manual handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3.3 Knowledge of and ability to respond to clinical signs related to adverse events.</td>
<td>Knowledge of and ability to adhere to facility specific policy and procedure for cleaning of nasendoscopes.</td>
<td>Knowledge of and ability to adhere to facility specific policy and procedure for cleaning of nasendoscopes.</td>
</tr>
<tr>
<td>2.3.4 Knowledge of reporting and documentation of adverse events</td>
<td>Knowledge of site specific Safety Learning Systems reporting of adverse events.</td>
<td>Completion of Tutorial training</td>
</tr>
<tr>
<td>2.3.5 Ability to maintain a safe workplace</td>
<td>Has demonstrated completion of organisational specific training in adverse reporting systems</td>
<td>Completion of appropriate readings Direct observation of FEES procedure by supervisor Observation of environment of FEES procedure</td>
</tr>
<tr>
<td>2.3.6 Able to identify and manage patient-related factors to optimise patient safety regarding placement or positioning of nasendoscope</td>
<td>Can verbally discuss patient related factors that may influence ability to pass nasendoscope or maintain correct position of nasendoscope for completion of FEES procedure (e.g. anxiety, physical discomfort/sensitivity, positioning pressure sores) Demonstrated ability to recognise and implement strategies to reduce patient factors</td>
<td>Completion of appropriate readings Direct observation of FEES procedure by supervisor Supervisor assessment of nasendoscopy positioning Observation of medical staff performing nasendoscopy</td>
</tr>
</tbody>
</table>
### SECTION 3  Procedural Aspect of FEES

**Competency 1: Preparation of patient**

<table>
<thead>
<tr>
<th>Experience, Knowledge and Skill</th>
<th>Performance Criteria</th>
<th>Assessment Process</th>
<th>Date Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.1 Ability to comprehensively explain the FEES procedure, its rationale and risks.</td>
<td>Demonstrated ability to describe FEES procedure and relevance. Can verbally explain the potential risks associated with FEES and their management to patients and carers as per patient information brochure. Ability to respond to queries from patient or significant other regarding FEES procedure.</td>
<td>Completion of appropriate readings Discussion with supervisor. Demonstration of discussion of procedure and with patient. Demonstration of knowledge of risks and strategies to minimise. Demonstration of knowledge of strategies to manage the risks should they occur.</td>
<td></td>
</tr>
<tr>
<td>3.1.2 Knowledge of organisational requirements in relation to obtaining patient consent.</td>
<td>Demonstrates ability to obtain consent and recognises when to engage family or medical team in consent process.</td>
<td>Demonstration of obtaining patient consent with patient, family/carer or medical team outlining the procedure as required by the organisation</td>
<td></td>
</tr>
<tr>
<td>3.4 Application of topical anaesthetic when clinically appropriate and in accordance with organisational guidelines</td>
<td>Knowledge of organisational specific policies e.g. use of topical anaesthetics</td>
<td>Adherence to site specific anaesthetic application guidelines</td>
<td></td>
</tr>
</tbody>
</table>
### Competency 2: FEES set up in preparation for specific patient

<table>
<thead>
<tr>
<th>3.2.1 Ability to prepare environment and equipment for FEES procedure</th>
<th>Demonstrate ability to prepare the environment for patient considering the following: Infectious status of patient, Mobility and positioning requirements, Additional personnel for procedure. Demonstrate ability to provide necessary equipment and positioning for procedure.</th>
<th>Demonstration of room set up and equipment use including provision of biofeedback equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.2. Knowledge of food and fluid consistencies as appropriate to patient for swallowing assessment.</td>
<td>Demonstrate ability to make appropriate selections of food and fluid consistencies for assessment.</td>
<td>Demonstration of appropriate patient specific selections.</td>
</tr>
<tr>
<td>3.2.3 Ability to ensure appropriate patient positioning for FEES procedure.</td>
<td>Demonstrates and can verbally discuss and instruct regarding the appropriate positioning of patient for assessment and biofeedback.</td>
<td>Demonstration of appropriate patient positioning for assessment and education.</td>
</tr>
</tbody>
</table>

### Competency 3: Ability to perform a comprehensive FEES assessment using a site specific formal protocol.

<table>
<thead>
<tr>
<th>3.3.1 Demonstrate understanding of the key aspects of a FEES assessment</th>
<th>Can identify the process for anatomical and physical examination, food and fluid trials, and trial of management strategies.</th>
<th>Direct observation of FEES assessments. Completion of required readings. Tutorial discussion with supervisor. Discussion with supervisor learner.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3.2 Ability to perform FEES examinations with a variety of patient aetiologies and settings.</td>
<td>Demonstrated ability to clearly and systematically progress through the key aspects of the FEES evaluation. Ability to select appropriate tasks from the FEES protocol. Ability to trial compensatory and rehabilitative strategies to maximise swallowing function during the assessment. eg manoeuvres, bolus delivery, volume changes, modified foods and fluids as appropriate.</td>
<td>Direct observation of FEES assessments. Completion of required readings. Tutorial discussion with supervisor. Discussion with supervisor learner. Review of patient type and settings seen.</td>
</tr>
</tbody>
</table>
| 3.3.3 Ability to lead the patient through the FEES procedure | Demonstrated ability to take responsibility and direct assessment tasks and swallowing trials to achieve the best possible outcome | Direct observation of clinical management during FEES examination
Demonstrated effective use of the site specific Work Instruction Protocol |
|---|---|---|
| 3.3.4 Selects appropriate materials, quantities and delivery method to be swallowed based on patient presentation | Demonstrated ability to make appropriate choices regarding, method of delivery, volume and consistency of food and fluid trials | Direct observation of FEES examination by supervisor
Evidence of suitable material selection |
| 3.3.5 Recognises abnormal anatomy/physiology associated with swallowing dysfunction | Demonstrated ability to identify abnormal anatomy/physiology related to swallowing function | Direct observation of FEES assessments by supervisor.
Completion of required readings
Discussion with supervisor |
| 3.3.6 Identifies swallowing abnormalities including, but not limited to
- abnormal secretions
- delayed swallow onset
- nasopharyngeal reflux
- pre-swallow spillage into pharynx
- laryngeal penetration without aspiration
- aspiration (type and amount)
- post swallow residue (location and amount)
- backflow from cricopharyngeus into pharynx
Identifies functional/non-functional airway protection
Identifies tasks suitable to determine sensory status | Demonstrated ability to identify swallowing abnormalities | Direct observation of FEES assessments by supervisor.
Completion of required readings
Discussion with supervisor |
| 3.3.7 Selects manoeuvres, strategies as appropriate for individual patient presentation and uses biofeedback for patient learning as needed. | Knowledge of and demonstrated ability to select patient appropriate manoeuvres and strategies e.g.  
- chin down  
- head turn  
- supraglottic swallow  
- super supraglottic swallow  
- hard swallow | Direct observation of FEES assessments by supervisor.  
Completion of required readings  
Discussion with supervisor |
|---|---|---|
| 3.3.8 Knowledge of FEES as a biofeedback tool | Ability to utilise biofeedback to enhance patient knowledge and understanding regarding their swallowing function and recommended strategies | Discussion with supervisor  
Tutorial  
Direct observation of use of biofeedback by supervisor. |

**Competency 3: Optimising patient safety through accurate identification and management of patient related factors.**

| 3.4.1 Ability to identify and effectively manage patient related factors that may influence the undertaking of FEES examination (anatomical, physical, emotional). | Can identify patient related factors eg  
- anxiety,  
- fatigue,  
- discomfort/sensitivity,  
- positioning,  
- anatomical deviations;  
Can implement effective strategies and support, provide verbal reassurance and encouragement to facilitate FEES procedure. | Discussion with supervisor.  
Demonstrated use of strategies during FEES procedure. |
|---|---|---|
| 3.4.2 Ability to recognise when to discontinue FEES procedure due to patient related factors. | Can discuss with patient and colleague factors or situations that warrant discontinuation of FEES procedure. | Discussion with supervisor.  
Demonstrated use of decision making during FEES procedure. |
### SECTION 4: Interpretive Knowledge and Skill

#### Competency 1: Interpreting Results and Reporting of Endoscopic Assessment of Swallow Function

<table>
<thead>
<tr>
<th>Experience, Knowledge and Skill</th>
<th>Performance Criteria</th>
<th>Assessment Process</th>
<th>Date Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1 Able to summarise key findings of examination using formal protocol as per local guidelines</td>
<td>Able to demonstrate knowledge of normal vs abnormal physiology and determine the impact of these findings on their swallow function</td>
<td>Direct observation of FEES reports</td>
<td></td>
</tr>
<tr>
<td>4.1.2 Able to interpret results of examination and communicate results of FEES assessment</td>
<td>Can verbally discuss findings clearly and accurately with patient, family or carer; medical, nursing and allied health staff.</td>
<td>Direct observation by supervisor</td>
<td></td>
</tr>
<tr>
<td>4.1.3 Recognises need for appropriate additional examinations</td>
<td>Able to determine the need for additional referrals to assist in diagnosis and swallowing management eg MBS exam or ENT referral or repeat FEES examinations.</td>
<td>Direct observation by supervisor</td>
<td></td>
</tr>
<tr>
<td>4.1.4 Determines need for treatment strategies and swallowing rehabilitation</td>
<td>Demonstrates awareness of variety of treatment and rehabilitation options</td>
<td>Direct observation by supervisor</td>
<td></td>
</tr>
</tbody>
</table>

#### Competency 2: Documentation of FEES findings

<table>
<thead>
<tr>
<th>Experience, Knowledge and Skill</th>
<th>Performance Criteria</th>
<th>Assessment Process</th>
<th>Date Achieved</th>
</tr>
</thead>
</table>
| 4.2.1 Demonstrated awareness of minimum reporting standards using formal FEES report as per local guidelines. | Record:  
- background information  
- normal and abnormal anatomy and physiology  
- swallowing trials and findings re spillage, residue, penetration/aspiration, sensation, cough response  
- swallowing strategies trialled and outcome  
- consideration of previous swallowing examination findings.  
- statement of assessment findings and summary  
- recommendations | Review of formal FEES reports by supervisor  
Review of local guidelines for local organisation | | |
| 4.2.2 Dissemination of FEES reports as appropriate | Demonstrated ability to report results of examination to other professionals  
Demonstrated adherence to local facility guidelines regarding confidentiality and dissemination of patient information. | Review of formal FEES reports by supervisor |
### SECTION 5: Maintenance of Skill

#### Competency 1: Complete FEES Examinations

<table>
<thead>
<tr>
<th>Knowledge and Skill</th>
<th>Performance Criteria</th>
<th>Assessment Process</th>
<th>Date Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.1 Submission of technical record for nasendoscopy</td>
<td>Completion of minimum 10 supervised scopes on patients per year, including 2 under supervision by medical supervisor</td>
<td>Evidence of record of technical component completion, signed off by credentialled Speech Pathologists and ratified by local organization supervising body/Local Health Network Credentialing Committee.</td>
<td></td>
</tr>
<tr>
<td>5.1.2 Submission of record of procedural and interpretive components of FEES examinations</td>
<td>Completion of 2 FEES assessments including procedural and interpretive aspects under supervision from supervisor.</td>
<td>Signed off by credentialled Speech Pathologists and ratified by local organization supervising body/Local Health Network Credentialing Committee.</td>
<td></td>
</tr>
</tbody>
</table>

#### Competency 2: Maintenance of Mandatory Training Requirements

| 5.2.1 To complete site specific mandatory training needs | Complete: 1. Basic Life Support training 2. Infection Control 3. Manual Handling 4. Other training as required | Evidence of completion of training | |

#### Competency 3: Attendance in professional development activities and sharing knowledge and skills with others

| 5.3.1 Commitment to ongoing learning and current evidence based practice in dysphagia and FEES | Attendance at formal/informal education eg workshops, conferences Ability to lead and support competency training of inexperienced clinicians | Documented attendance at professional development events Discussion with other FEES clinicians Training of less experienced clinicians in FEES Verbal discussions regarding case mx | |

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SA Acute Hospital Program for Credentialing Speech Pathologists in the Extended and Advanced Practice Role of Independent Fibreoptic Endoscopic Evaluation of Swallowing (2016)
### SECTION 6: Competency following extended leave

**Competency 1: Complete FEES examinations**

<table>
<thead>
<tr>
<th>Knowledge and Skill</th>
<th>Performance Criteria</th>
<th>Assessment Process</th>
<th>Date Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1.1 Knowledge of current imaging equipment</td>
<td>Demonstrate knowledge of update in imaging equipment</td>
<td>Demonstrate use of current FEES equipment.</td>
<td></td>
</tr>
<tr>
<td>6.1.2 Complete 10 FEES procedures under direct supervision by a credentialed speech</td>
<td>Ability to conduct FEES procedures independently including procedural, interpretive,</td>
<td>Observed evidence of FEES procedure completed under supervision of credentialed clinician.</td>
<td></td>
</tr>
<tr>
<td>6.1.3 Complete 2 FEES procedures under direct medical supervision for credentialing of technical component of FEES</td>
<td>Ability to complete technical component of FEES if previous competency achieved</td>
<td>Observed evidence of FEES procedure completed under supervision of medical supervisor.</td>
<td></td>
</tr>
<tr>
<td>6.1.4 Complete mandatory training requirements</td>
<td>Complete:</td>
<td>Documented evidence of completion of mandatory training.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Basic Life Support Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Infection Prevention Guidelines</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Other as required by local organisation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### SECTION 7: Recognition of Competency between sites/organisations

#### Competency 1: Evidence of previous satisfactory completion of training

<table>
<thead>
<tr>
<th>Knowledge and Skill</th>
<th>Performance Criteria</th>
<th>Assessment Process</th>
<th>Date Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1.1 Previous FEES training</td>
<td>Presentation of formal FEES training log for each component of training.</td>
<td>Review of documentation with capacity to verify with previous employer</td>
<td></td>
</tr>
</tbody>
</table>

#### Competency 2: Training in local FEES policies and procedures

<table>
<thead>
<tr>
<th>Knowledge and Skill</th>
<th>Performance Criteria</th>
<th>Assessment Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.2.1 Knowledge of FEES imaging equipment</td>
<td>Demonstrate ability to use facility specific FEES imaging equipment.</td>
<td>Review of local facility equipment manual or guidelines. Direct observation of imaging equipment</td>
</tr>
<tr>
<td>7.2.2 Knowledge of local FEES clinical guidelines and relevant position papers and documents.</td>
<td>Verbally discuss and identify differences or gaps</td>
<td>Discussion with supervisor FEES clinician/Director of Speech Pathology.</td>
</tr>
<tr>
<td>7.2.3 Complete 2 FEES procedures under direct supervision by local credentialed FEES clinician and/or medical officer.</td>
<td>Demonstrated ability to conduct FEES procedural, interpretive and technical components according to local context</td>
<td>Evidence of FEES procedures completed Log book completed Discussion with credentialed FEES clinician of completed cases – reflection of performance, areas of difference from previous context. Discussion with Director of Speech Pathology</td>
</tr>
<tr>
<td>7.2.4 Complete mandatory training requirements</td>
<td>Complete:</td>
<td>Documented evidence of completion of mandatory training.</td>
</tr>
<tr>
<td></td>
<td>• Basic Life Support Training</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Infection Prevention Guidelines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other as required by local organisation</td>
<td></td>
</tr>
</tbody>
</table>
Appendix D: Reference List

Adrian et al (1956) Fatalities following topical application of local anaesthetics to mucous membranes. JAMA, 162(17): 1527-1530


Cimoli and Sweeney 2012


Competency Based Occupational Standards (CBOS), Speech Pathology Australia, 2001


Fibroptic Endoscopic Evaluation of Swallowing (FEES) Competency Training Program Clinical Education and Training Queensland Allied Health 2012


Speech Pathology Australia Clinical Guideline-Dysphagia (Speech Pathology Australia 2012)

Speech Pathology Australia Position Statement Credentialling (Speech Pathology Australia 2009)

   http://www.speechpathologyaustralia.org.au

Speech Pathology Australia Clinical Guideline-Tracheostomy Management (Speech Pathology Australia 2013)

Speech Pathology Australia Clinical Guideline-Videofluoroscopic Swallow Study (Speech Pathology Australia 2013)

Speech Pathology Australia- Scope of Practice in Speech Pathology (Speech Pathology Australia 2015)


Endorsement of FEES Credentialing program

MEMORANDUM

TO:      Mr Eng Ooi
         Head of Department of Otolaryngology
         Flinders Medical Centre

         Professor Robert Fraser
         Department of Gastroenterology
         Repatriation General Hospital

         Mr Suren Krishnan
         Head of Department of Otolaryngology
         Royal Adelaide Hospital

         Professor PJ Wormald
         Head of Department of Otolaryngology
         Queen Elizabeth Hospital

FROM:    Jacqui Beaty, on behalf of SA Speech Pathology FEES Credentialing Working Party

RE:      ENDORSEMENT OF SA SPEECH PATHOLOGY FEES CREDENTIALING PROGRAM

DATE:    17 November 2016

I endorse the attached document entitled South Australian Acute Hospital Program for Credentialing Speech Pathologists in the Extended and Advanced Practice Role of Independent Fibreoptic Endoscopic Evaluation of Swallowing (F.E.E.S) 2016, which recognises Speech Pathologists in independent practice of FEES within SA Health.

Signed............................................ Dated 17/11/16

Mr Eng Ooi
Head of Department of Otolaryngology
Flinders Medical Centre
I endorse the revised South Australian Acute Hospital Program for Credentialing Speech Pathologists in the Extended and Advanced Practice Role of Independent Fibreoptic Endoscopic Evaluation of Swallowing (F.E.E.S.) 2016, and support Speech Pathology independent practice of F.E.E.S within SA Health.

Name: PROFESSOR P.J WORMALL
Position: PROF CHAIR, OTORHINOLARYNGOLGY H.N.S
Signature: [Signature]
Date: 3/4/16
ENDORSEMENT OF SA SPEECH PATHOLOGY FEES CREDENTIALING PROGRAM AND PRACTICE
2016

I endorse the revised South Australian Acute Hospital Program for Credentialing Speech Pathologists in the Extended and Advanced Practice Role of Independent Fibreoptic Endoscopic Evaluation of Swallowing (F.E.E.S.) 2016, and support Speech Pathology independent practice of FEES within SA Health.

Name: SUREN KRISHNAN
Position: Head of Unit, ENT HNS RPWT
Signature: [Signature]
Date: 23/11/16
MEMORANDUM

TO:  
Mr Eng Ooi  
Head of Department of Otolaryngology  
Flinders Medical Centre

Dr Charles Cock  
Director of Investigative Procedures Unit  
Department of Gastroenterology  
Repatriation General Hospital

Mr Suren Krishnan  
Head of Department of Otolaryngology  
Royal Adelaide Hospital

Professor PJ Wormald  
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FROM:  Jacqui Beatty, on behalf of SA Speech Pathology FEES Credentialing Working Party

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Signed ........................................ Dated 17/11/16

Dr Charles Cock  
Director of Investigative Procedures Unit  
Department of Gastroenterology  
Repatriation General Hospital
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Date of next review: December 2018