Introduction

There are multiple methods and techniques available to successfully complete all the topics presented in this workshop. Some are based on patient request, available equipment or supervising physician’s preference.

The goal of this workshop is to correctly demonstrate the most common methods and give participants time for hands on training.
Flexible Fiberoptic Workshop:
Basic Course

Learning objectives
• Discuss normal anatomy visible via flexible fiberoptic nasopharyngoscopy
• Practice the use of the flexible fiberoptic nasopharyngoscope on mannequins.
• Practice the use of the flexible fiberoptic nasopharyngoscope on simulated patient
• Understand and practice proper endoscope use and care.
• Normal variants and abnormal findings will be discussed in Advanced Course.

Examining the Larynx

The simplest form of laryngeal examination is called "indirect laryngoscopy". The examiner can place a small mirror in the back of the throat and angle it down towards the larynx. Light can be reflected downward and the larynx can be seen in the mirror. Indirect laryngoscopy can be quick and gives a good three dimensional view of the larynx in true color. However, some individuals have a strong gag reflex and cannot tolerate the mirror exam. Normal speech cannot be assessed since the mirror must remain in the back of the throat.

Laryngeal Anatomy (Mirror*)

*Mirror Laryngoscopy, image is inverted.
Indirect Laryngoscopy

Interactive, live demonstration of indirect laryngoscopy

Task: Practice indirect laryngoscopy
Indications: Asses vocal cords on mannequin and simulated patient.

1. Explain Procedure. Prepare supplies

2. Position patient
3. Apply topical anesthetic soft palate.

4. Stabilize tongue with non-dominant hand.

5. Place warm dental mirror in the back of the throat and angle it down towards the larynx. Light can be reflected downward and the larynx can be seen in the mirror.

6. Indirect laryngoscopy can be quick and gives a good three dimensional view of the larynx in true color.

Mirror laryngoscopy image is inverted.

Types of Scopes

There are two special optical instruments that can be used to examine the larynx during an office visit; Flexible and Rigid Endoscopes.

The curved part of the scope is a flexible fiberoptic cable that can be passed through the nose and through the pharynx until it gives a view of the vocal folds. The flexible scope causes very little gagging and is actually quite comfortable. Using the flexible endoscope, the larynx can be examined during normal speech.
Components of Scope

- Eyepiece/lens
- Light cable
- Light Source
- Up/Down Angulation control
- Bending section
- Objective lens

Flexible fiberoptic exam on Adults

- Generally well tolerated by adults.
- Explain procedure in detail.
- Give adequate time for anesthesia.
- Provides better visualization.

Flexible fiberoptic exam on infants & children

- Generally well tolerated by infants and children.
- Explain procedure in detail.
- Secure patient (papoose vs. cradle)
- Anesthesia vs. decongestant?
- Give adequate time for anesthesia.
- Provides better visualization
Indications for Fiberoptic Endoscopy (FOE)

- Sinusitis
- Epistaxis
- Nasal obstruction
- Foreign body
- Strong gag reflex*
- Failed mirror exam*

*Documentation of a strong gag reflex and failed mirror exam should be included in note to justify procedure for billing purposes.

Contraindications for Fiberoptic Endoscopy (FOE)

- Epiglottitis (by inexperienced)
- Relative:
  - Coagulopathy
  - Craniofacial trauma

Coding

- 31231 Nasal Endoscopy (diagnostic)
- 31237 Debridement Endoscopy, Nasal
- 31575 Flexible Fiberoptic Laryngoscopy
- 31505 Laryngoscopy, Indirect
- 31515, Laryngoscopy, Direct
- 92511, Nasopharyngoscopy

- Use most specific procedure code with appropriate diagnosis.
- Cannot bill for BOTH 31231 (naso) and 31575 (larynx).
- Sinus debridement post-operative (31237) usually requires prior authorization.
Documentation

- Effective January 1, 2014, any payer requesting documentation for a scope procedure could either deny the service or reduce the payment if documentation doesn’t show that all areas were examined during the endoscopy and the findings noted.
- According to Medicare, documentation should identify specific anatomical landmarks. “form over substance”.
- CPT® guidelines state, “For endoscopic procedures, report appropriate endoscopy of each anatomic site examined.
  - 31574 Flexible Fiberoptic Laryngoscopy, 31505 Laryngoscopy, Indirect, 31515, Laryngoscopy, Direct. Includes examination of the tongue base, larynx, and hypopharynx. If using operating microscope, telescope, or both, use the applicable code only once per operative session.
  - 31231 Nasal Endoscopy (diagnostic), and 31237 Debridement Endoscopy, Nasal should include mention of the superior turbinate, superior meatus and sphenoid recess.
- Clinicians need to clearly document each area’s examination and whatever findings were observed.

Sample Templates

Template should also include description of positioning of patient, application of topical anesthetic and any decongestants. If consent was obtained, verbal vs. written. Document indication for procedure. At completion of procedure note if patient tolerated procedure and if there were any complications.

Fiberoptic Laryngoscopy Findings:
- Nasopharynx - WNL
- Oropharynx - WNL
- Base of Tongue - WNL
- Vallecula - WNL
- Lateral Pharyngeal Wall - WNL
- Posterior Pharyngeal Wall - WNL
- Epiglottis - WNL
- Aryepiglottic Folds - WNL
- Pyriform Sinuses - WNL
- Tracheal Rings - WNL
- Vocal Cords - WNL
- False Cords - WNL
- Ventricles - WNL

Fiberoptic Nasal Endoscopy Findings
- Septum
- Right Side
  - Inferior Turbinates - WNL
  - Middle Turbinates - WNL
  - Middle Meatus - WNL
  - Maxilla - WNL
  - Maxilla - WNL
  - Polyps - None
- Left Side
  - Inferior Turbinates - WNL
  - Middle Turbinates - WNL
  - Middle Meatus - WNL
  - Maxilla - WNL
  - Maxilla - WNL
  - Polyps - None
- Nasopharynx - patent
- Sphenoid and ethmoid cavities-WNL

* Denotes laterally i.e. Left side, Right side
Examination Nasal Airway

- Bilateral nasal valve collapse
- Septal deviation

Normal Nasal Endoscopy

Healthy pink mucosa. Inferior and middle turbinate are visualized and airway is patent.

Normal anatomy of the middle turbinate and middle meatus, the space into which several sinuses drain.

Septal Deviation/ Turbinate Hypertrophy

http://med.stanford.edu/ohns/sinuscenter/resources/multimedia.html

Septal Deviation/ Turbinate Hypertrophy
Anatomy of Larynx

Base of Tongue

Lingual tonsils

Laryngeal Anatomy (FOE*)

True Vocal Cords abducted

True Vocal Cords adducted

*Fiberoptic Laryngoscopy, image is true.
Tips For Starting the Exam

• Patient informed of the procedure (obtain consent)
• Proper positioning
  – Sniffing, head supported, use non-dominant hand to steady the pts. Head
  – Choose the most patent of the nares
• Appropriate equipment
  – Adult vs. Pedi
  – Decongestant/anesthetic
  – Gloves
  – Chair
  – Photographic/video accessories
  – Biopsy materials if needed
  – Lubricant +/-

Preparation for FOE

• May want patient to blow nose.
• Assess most patent of nares.
• Antifogging solution.
• Apply topical decongestant
  – 0.05% Oxymetazoline
  – 0.25-2% Phenylephrine
• Apply topical anesthetic
  – 4% Lidocaine
  – Pontacaine

Technique

NO lube to distal 2 cm or use anti-fog
Oral respiration vs. nasal?
Slide scope along floor of nose, avoid septum
Visualize turbinates and assess mucosa. Look for secretions, polyps or neoplasms.
At the soft palate, start to direct the scope inferriorly
  – Protrude tongue (visualize vallecula)
  – Puff cheeks
  – Vocalize eeeeee (vocal cord movement)
  – Vocalize kkkk (elevates soft palate)
  – Müller’s maneuver (sleep apnea)
Complications

- Tearing
- Epistaxis
- Coughing
- Laryngospasm – rare

Advise patient not to eat or drink anything 1 hour after procedure.

Normal Exam

Flexible Laryngoscopy

Interactive, live demonstration of flexible fiberoptic endoscopy
2. Position patient.
3. Apply topical anesthetic & decongestant nose.
4. Perform flexible naso/laryngeal endoscopy.
5. Direct laryngoscopy provides detail view of nasal passage and vocal cord function.
6. Remove endosheath and maintain clean technique.

Care of the Scope

- Scopes are sturdy, but NOT indestructible
- All scope users should be familiar with care, use, proper cleaning and storage
  - The scopes should be stored and cleaned in a specified area with separate cleaner, drying and storing areas.
- Flexible scopes are delicate heat labile instruments, and thus not amenable to autoclave sterilization.
- High-level decontamination is usually adequate.
- Sterilization in normal circumstances is unnecessary as the endoscope does not usually penetrate mucosal barriers but may come into contact with blood through inadvertent trauma.
- As there is little level one evidence published on the decontamination of flexible endoscopes in the ENT literature, much of the evidence and practice is extrapolated from the use of flexible endoscopes by our gastroenterology and pulmonary colleagues. However, in ENT practice; most endoscopes do not possess suction or biopsy channels or accessories: this is the significant difference from the endoscopes used in other procedures.

Daily Care

Endosheaths
Cold Sterilization
Endosheaths vs. Cold Sterilization

- Sterile disposable sheaths are custom built for a variety of scopes and some models even come with a working channel.
- The tip of the sheath must be fully slid onto the scope so that the special optical element at the end of the sheath is flat against the tip of the scope.
- After using the sheath, it can be slid off and disposed of without the need to re-sterilize the scope.
- These sheaths should never be forcefully removed.
- Flexible scopes are non-autoclavable.
- Clean length of flexible scope with an enzymatic detergent solution like ENZOL® to remove debris and reduce bacterial burden before instruments are disinfected or sterilized.
- Soak flexible scope in a glutaraldehyde solution like Cidex® which provides quick high-level disinfection.
- Noncorrosive solution reduces instrument damage and associated repair costs.
- Soaking times vary by product.

Endosheaths

Loosen endosheath  Pull endosheath from distal end

Leak Testing

1. Routine leak testing in accordance with specific manufacture depending on volume of use.
2. Introduce air pressure via attached bulb (DO NOT overinflate) and submerge looking for leaks.
3. Leaks can slowly damage fiberoptics and internal parts causing expensive yet preventable damage.
Helpful Care Tips

• Avoid bending scope in tight angles.
• Clean lens with lens cleaner/paper.
• Pre-clean with enzymatic cleaner.
• Soak only for required period depending on brand and manufacture.
• Store in dry safe place.
• Perform regular leak testing to avoid damage.

Practice Flexible Fiber Optic Exam

Practice on mannequins and become familiar with scope angulation and focusing.
This is the time to gain confidence on mannequins and simulated patients before performing on live patients.

Practice Fiber Optic Exam

Practice Fiber Optic Exam on mannequins.
Practice Fiber Optic Exam on each other.
Flexible Fiberoptic Workshop: Basic Evaluation
Score cards will be used for admission to workshops and attendance. Credit will only be awarded for completed score cards.

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<thead>
<tr>
<th>Task</th>
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<tr>
<td>Understand indications &amp; contraindications to exam.</td>
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<td>Properly explain procedure.</td>
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<td>Apply topical anesthetic &amp; decongestant.</td>
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<td>Perform flexible fiberoptic endoscopy on mannequin.</td>
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<td>Perform flexible fiberoptic endoscopy on simulated patient.</td>
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<td>Identify normal anatomy.</td>
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<td>Demonstrate proper sterilization and handling technique.</td>
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Proctor Name
Proctor Signature

Resources On-Line
New England Journal of Medicine Video
http://www.youtube.com/watch?v=3tbuF7Qwmps

Excellent pictures and videos by Dr. Kevin Kavenaugh
http://www.entusa.com/larynx_photo.htm

Dr Rahmat Omar
http://www.drrahmatorlummc.com/

Direct Laryngoscopy video
http://www.airwaycam.com/video-library.html
Recommend Reading

Examination of the Larynx and Pharynx
n engl j med 358;3
www.nejm.org january 17, 2008

Laryngeal Evaluation by Kendall & Leonard
Publication Date: August 2010
324 pp, 309 illustrations
hardcover & video
ISBN (Americas): 9781604062724