Objectives for Advanced Endoscopy Fellowship: Endoscopic Ultrasound (EUS)

Educational Objectives:

1. Medical Expert:

i. Peri-procedural management – cognitive skills:
   a. Understand anatomy and its congenital variants as it pertains to EUS, with special attention paid to structures around the lumen of the gastrointestinal tract prior to learning EUS imaging in vivo.
   b. Comprehend indications, contraindications, complications (pertaining to the procedure and sedation) and their management.
   c. Able to obtain a proper history, physical exam and integrate laboratory evaluations of patients with needs for EUS including radiological imaging pertaining to EUS.
   d. Special consideration for the proper and safe method of sedation for EUS. Trainee should be competent in determining the need for anesthesiologist in the appropriate clinical scenario vs. using conscious sedation.
   e. Assess patients for consideration of EUS and in follow up in the setting of a longitudinal clinic as well as in-patient consult service.

ii. Ultrasound principles will be learned using a textbook of ultrasonography[2-7] as well as video instructions (Appendix B).

iii. Understand diseases and conditions assessed with EUS and comprehend how they pertain to the diagnosis, treatment and follow-up care of this patient population. These include:
   a. Areas of benign or malignant (gastrointestinal, pancreaticobiliary and thoracic) diseases, and extraluminal masses, fluid collections and disorders of the intestinal musculature.

   b. Trainees should be able to stage malignancies by EUS using the most recent AJCC TNM staging methodology.[8]

iv. Learn cognitive skill of EUS pattern recognition and image interpretation initially using text books[2-5] and EUS training videos (Appendix B), followed by observation of an expert and later self-performance using station-based approach with and finally without the aid of a qualified educator.

v. Learn how to operate:
   a. Echoendoscopes and ultrasound probes and their proper care.
   b. Processor (obtaining optimal images, using available presets, image frequencies, gain, magnification, Doppler flow, labeling and obtaining hard copies and electronic recording of images, troubleshooting common problems) and its proper care.

vi. Passage of a echoendoscope and evaluation of the upper-GI tract including:
   a. Esophageal intubation
   b. Traversing the stomach
   c. Pyloric intubation
   d. Positioning of the in the second and third portion of the duodenum
   e. Navigating surgically altered GI anatomy.

vii. Passage of a tangential viewing echoendoscope for lower gastrointestinal EUS through the anus to sigmoid colon.

viii. Learning diagnostic EUS imaging:
   a. Understand methods to optimize imaging for various disease specific states using either radial or linear echoendoscopes as well as catheter-based ultrasound probes.
   b. Learn how to perform EUS in an efficient manner. During training, a balance will be taken between trainee learning time and expediting patient exam to minimize risk to the patient.
   c. Graded responsibility and time is given to the learner as the fellow progresses in ability as decided by the educator.

ix. Learning EUS-guided FNA and core biopsy technique:
   a. This should only be introduced once trainee can reliably identify normal and abnormal structures.
   b. Skills around indications, contraindications, risks, administration of prophylactic antibiotics, management of anticoagulants and anti-platelet agents should be learned.
   c. Learn how, when and where to use different sizes of needles. Needle preparation, needle introduction, withdrawal, adjusting needle sheath length, use of elevator as well as troubleshooting with needle malfunction and safe path of needle passage into patient is expected.
   d. Graded difficulty of needle puncture of the gastrointestinal tract should be done with beginning with easiest and progressing to most difficult when appropriate with respect to the abilities of the trainee.

x. EUS FNA cytological evaluation:
   a. Learn how to get the material from the needle onto slides and into cytological solutions, using various stains and their differences.
   b. Understand the advantages and disadvantages of immediate cytologic evaluation of the material by a cytotechnician or cytopathologist.

xi. Perform small bowel imaging (capsule endoscopy and single balloon enteroscopy) when feasible. Participate in advanced endoscopy procedures that may not always pertain to EUS or ERCP (ex: EMR, enteral stenting, removal of large polyps etc.)

xii. Simulator:
   a. Hands on simulator may complement but not substitute for supervised real cases.
   b. Participate in use of mechanical simulator if available.

2. <u>Communicator</u>:

i. Communicate with nursing staff, house staff, cytopathology technician, and auxiliary staff involved in the care of EUS patients.

ii. Obtain informed consent from patients or alternative decision makers for EUS.

iii. Generate EUS report promptly following the EUS procedure and communications of appropriate information for various indications of EUS taking into account areas of wording and recording certain areas of uncertainty for referring physicians. Documenting the indication of the procedure, sedation, the procedure itself, findings, complications, clinical impressions and plan of action for the patient. When possible, foster standardization of reporting and data collection throughout the endoscopic community.

iv. Communicating with referring physician, in appropriate situations, directly via telephone conversation or e-mail when pertinent expeditious information regarding the care of EUS patients is needed.

v. Communicate with patients and when appropriate their care providers and/or family members about the results, plan and follow-up care using effective nonverbal, explanatory, questioning, and writing techniques of patients needing EUS.

3. <u>Collaborator</u>:

i. Work effectively and develop effective working relationships with endoscopy room staff (Anesthesiologist, Anesthesia Technicians, RN's, residents, medical students, cytophathology technicians, para-medical staff, etc.) to perform procedure while recognizing their training, abilities and limitations.

ii. Consult other services appropriately, such as ERCP, Surgery, Medical Oncology, Radiation Oncology, Pathology, Cytopathology, Palliative Care, Pain control when and if indicated. Provide in-patient ERCP/EUS consults in a timely manner.

iii. Participate in General Gastroenterology after hours on call service on week-days and week-ends.

4. Manager:

i. Understand the relative cost and benefits for different choices of diagnostic and therapeutic procedures and when to use them appropriately.

ii. Learn to triage patients effectively for various indications of EUS for administrative and nursing staff. Create appropriate timelines for access to the procedure. Give any special instructions (anticoagulation, antibiotics, anti-platelet agents etc.), as well as the type and order of instruments that will be required for the procedure at least 24h working hours in advance of the procedure to administrative and RN staff.

iii. Utilize outpatient endoscopy booking in a cost-efficient manner while maintaining high standards of care including excellent patient comfort, high percentage procedure completion, appropriate and successful diagnostic/therapeutic maneuvers and acceptable complication rates, with patient safety as number one priority.

iv. Be exposed to a hospital administrative committee responsible for the development and maintenance of equipment, facilities and standards of care.

v. Complete all workups and follow-up care plan for all EUS patients before discharge from the endoscopy facility.

vi. Keep logs of all EUS procedures performed including indication, type of procedure, type of instruments used (echoendoscope, FNA, core biopsy, etc.)

5. Health Advocate:

i. Understand the implications of EUS to patients who do or do not have ready access to this procedure

ii. Understand the impact that EUS has made for accurate gastrointestinal illness diagnosis, avoidance of other more invasive diagnostic/therapeutic procedures, implementation of new medical treatments and reduction in gastrointestinal surgery.

iii. Promote and educate the use of EUS procedures to other medical colleagues, RNs, and the general public to improve access for patients and to reduce costs, morbidity and mortality associated with less appropriate means of diagnosis and treatment.

6. <u>Scholar</u>:

i. Stay abreast of current literature and techniques as it relates to EUS.

ii. Develop research protocol in EUS, obtain ethics approval, apply for grant funding when necessary and complete the project with presentation at a national or international meeting as well as manuscript submission for publication.

iii. Attend all teaching functions pertinent to EUS (Research Conferences, Journal Club, Fellowship Seminars, Cytopathology, Radiology etc.)

7. <u>Professional</u>:

i. Develop professional attributes (wear professional attire) and manners (respect, compassion, and integrity) with respect to interacting with patients, nurses, and colleagues. Be punctual and arrive in the EUS room well-read about the patient's disease, planned strategy and the expected outcome of the procedure.

ii. Respond to the needs of patients and society and demonstrate accountability to patients, society, and the profession of medicine.

iii. Demonstrate commitment to excellence and on-going professional development.

iv. Demonstrate commitment to ethical principles pertaining to the provision of or withholding of clinical care and maintaining confidentiality of patient information.

v. Respond sensitively to patients in a non-discriminatory manner.

vi. Maintain ethical interaction with members of the EUS equipment and related supply industry.

Appendix A:
Bibliography:

1) www.uchsc.edu as well as www.primal pictures.com/register.htm
2) Kefalides P, Gress F: Training in endoscopic ultrsonography. In: Savides TJ, Gress FG (eds), Endoscopic Ultrasonography, 2nd ed. London: John Wiley co., 2009 – or latest edition.
3) Hawes R, Fockens P: Endosonography. Philadelphia, PA: Saunders, 2006 or latest edition
4) Bhutani MS, Deutsch JC: Digital Human Anatomy and Endoscopic Ultrasonography. Hamilton, ON: BC Decker 2005 or latest edition.
5) Dietrich CF: Endoscopic Ultrasound: An introductory Manual and Atlas. Munich: Thieme Georg Verlag Inc., 2006
6) Kremkau FW: Diagnostic Ultrasound: Principles, Instruments & Exercises: W.B. Saunders Company, 1989
7) Kremkau FW: Doppler Ultrasound: Principles & Instruments: W.B. Saunders Company, 1994
8) Stephen B. Edge: AJCC Cancer Staging Manual 7th edition. Springer 2009 or latest updated edition
9) Guidelines in the training in Endoscopic Ultrasound Gastrointest. Endosc; 1999; 49(6): 829-833
10) Leong Ang et al. EUS 2010 in Shanghai; 2011;43(Sup 3): S1-S20

Recommended Text:

1) Hawes R, Fockens P: Endosonography. Philadelphia, PA: Saunders, 2006 or latest edition

Appendix B:
Reference Videotapes:

The following videotapes are available as part of the ASGE Endoscopic Learning Library. A portion of each videotape may be viewed online, and purchase information is available at www.asge.org/library or by calling ASGE at 1-866-353-ASGE (2743)

1) John Meenan, Charles Vu: EUS in Hand [interactive DVD average time to view 240:00]
2) Henning Gerke, Maged K., Kerry A. Proctor, Gail C. Crowe, Mary C. Bartley: EUS Guided Tissue Sampling Techniques: Cytology & Biopsy [35:52]
3) Michael J. Levy, Mark D. Topazian: Therapeutic EUS [82:00]
4) Jarrod L., Sachithanandan S. Raman K., Ming C., Ling C.: A Primer to Hepato-pancreatico-biliary EUS [75:00]
5) Hawes R et al. Linear Echoendosonography MUSC/Olympus
6) Wallace M et al. Radial Echoendosonography MUSC/Olympus

Prepared by Nadeem Hussain, MD January 15, 2012. Revised Feb 24, 2014.