

SECRETIN ENDOSCOPIC PANCREATIC FUNCTION TEST (EPFT) PROTOCOL

1. The patient is placed in left lateral decubitus position with slight head elevation. The posterior pharynx is sprayed with topical cetacaine spray. A sedation and analgesia bolus is administered according to our previously published nomogram [Table] (1). Doses based on this nomogram have not been shown to effect pancreatic secretion (2). Further sedation doses may be given if necessary for patient comfort; however, the effect of higher doses on pancreatic secretion has not been studied. After the sedation bolus, a bite-block is placed.
2. Esophagogastroduodenoscopy (EGD) is performed using a standard (10mm) or thin (6mm) upper endoscope. We have tended to use the Olympus 160XP (6mm) scope for the ePFT because it optimizes patient comfort during the prolonged endoscopy; however, standard adult scopes also work well.
3. During luminal examination, an intravenous (IV) test dose of synthetic secretin (human or porcine, 0.2 micrograms) is administered. After the test dose, the pulse-ox and blood pressure are monitored for 5 minutes to insure no rapid change. An allergic reaction to synthetic secretin has never been reported; however, this measure optimizes safety.
4. Gastric fluid is aspirated as completely as possible through the scope and discarded. We recommend retroflexion to optimally aspirate fundic gastric juice.
5. After gastric fluid aspiration and discard, approximately 3-5 cc of fluid should be suctioned from the post-bulbar duodenum to rinse residual gastric fluid from the suction channel.
6. At time "0" a baseline collection of 3-5 cc of duodenal fluid is collected in a trap (bottle A). Also at time "0", the full IV dose of synthetic secretin (0.2 micrograms/kg, slow push) is administered.
7. Intermittent 3-5 cc fluid aspirates are obtained every 15 minutes for an hour (Bottles B at 15 minutes, C at 30 minutes, D at 45 minutes, and E at 60 minutes).
8. Some general points about fluid collection:
 - Fluid samples are usually easily aspirated within seconds because of the large volume of pancreatic fluid secretion following secretin. Occasionally, fluid secretion is less voluminous (particularly in advanced chronic pancreatitis) and may require 3-5 minutes of endoscopic manipulation to obtain an adequate sample.
 - We try to keep the tip of the scope in the post-bulbar duodenum throughout the entire hour-long procedure. Between collections, the scope may be allowed to rest on the pillow or gurney in a secure position with the guardrail up to minimize movement of the scope and enhance comfort.
 - Occasionally, fluid is very scarce. In this case, we put the patient in a supine, reverse-trendelenburg position to maximize pooling of fluid in the second duodenum.
 - Low to intermediate suction is best to minimize trauma to the mucosa—blood in the fluid may effect the bicarbonate concentration. Another practical tip is to remove the suction cap from the scope and hold it lightly on top of the channel hub during aspiration. This allows close control of the amount of suction and minimizes mucosal trauma.
 - After a collection, tightly cap each specimen and put immediately on ice.
9. Fluid should be kept on ice and analyzed within 6 hours (3), or may be frozen (subzero freezer is best) and analyzed later.
10. A standard, hospital laboratory auto-analyzer (e.g. Beckman-Coulter CX3 Delta model) may be used for bicarbonate concentration analysis.
11. The highest bicarbonate concentration from the 5 samples is considered the peak bicarbonate (4). A peak bicarbonate < 80 mEq/L is considered abnormal and suggestive of exocrine insufficiency.
12. Further studies are currently being done to:
 - Directly compare the ePFT to the gold-standard Dreiling secretin test (5)
 - Better define cut points for normal, mild, and severe exocrine insufficiency
 - Develop an accurate shortened version (5)
 - Determine the optimal role of secretin ePFT in the work up of abdominal pain

References:

1. Morrow JB, Zuccaro G, Conwell D, et al. Sedation for colonoscopy using a single bolus is safe, effective and efficient: a prospective, randomized, double blind trial. *Am J Gastroenterol* 2000;95:2242-7.
2. Conwell DL, Zuccaro G, Purich E, et al. The effect of moderate sedation on exocrine pancreas function in normal healthy subjects: a prospective, randomized, cross-over trial using the synthetic porcine secretin stimulated endoscopic pancreatic function test (ePFT). *Am J Gastroenterol* 2005: In press.
3. Stevens T, Conwell DL, Zuccaro G, et al. Stability of duodenal fluid bicarbonate concentration as measured by a laboratory auto-analyzer. *Pancreas* 2004;29:342.

4. Conwell DL, Zuccaro G, Vargo JJ, et al. An endoscopic pancreatic function test with synthetic porcine secretin test for the evaluation of chronic abdominal pain and suspected chronic pancreatitis. *Gastrointest Endosc* 2003;57:37-40.
5. Stevens T, Conwell DL, Purich E, et al. A prospective, randomized, crossover trial in healthy subjects comparing endoscopic and Dreiling tube collection methods for pancreatic function testing. *Pancreas* 2004;29:341.
6. Stevens T, Conwell DL, Love TE, et al. Comparative regression analysis to determine the diagnostic accuracy of a single or dual endoscopic aspiration for the assessment of pancreatic function. *Gastroenterology* 2005, In press.