**How to Pass the FES**

Before reading, please view the videos below courtesy of SAGES and Dr. Jeffrey Marks. The first video is most useful (the second one is optional). You can skip to 59:40→ 1 hour 29 minute mark on the second video although all sections are worth watching. Simply put, your time of the sim trainer is critically important and will determine your ability to PASS the exam.

1. **Fundamentals of Endoscopic Surgery (FES) - Hands-on Modules -** [**https://www.youtube.com/watch?v=6wMT3I-Nm1w**](https://www.youtube.com/watch?v=6wMT3I-Nm1w)
2. **SAGES Fundamentals Endoscopic Surgery Passing Exam Sept 2016 -** [**https://www.youtube.com/watch?v=Jd1monGYL3A**](https://www.youtube.com/watch?v=Jd1monGYL3A)

**Manual Skills:**

***0. Starts with a warm-up.***

* This is not graded. It’s the balloon popping session. Similar to the 1st balloon module on the trainer where the balloons do NOT disappear. Don’t worry about this at all. Not a part of passing the test. Just getting used to the scope you’ll use on the exam.

1. **Endoscopic Navigation = Shapes / Funnel Alignment**

* **GI Sim**: **Fundamental Skills Module - Task 2**
* **Practice Goal**: < 6 minutes
* **Test Day Notes**: The test is harder because the funnel is a trickier shape than the oval from the GI Sim, but overall, this is pretty easy if you get good at the practice module. There are 10 shapes. Not too bad. My little wheel was halfway locked and I didn't realize. I did it in 3:31 (we’ll see if that’s passing or not). Bethany - I passed and per my usual, took the entire time allotted. One of the funnels was completely upside down so practice that

1. **Loop Reduction (but it doesn’t call it loop reduction)**

* **GI Sim**: No dedicated module yet (expected in Q4 of 2017)
  + However, **Lower GI - Part 1, Case 6** is a good start as this has some modest loop-forming passes that you can practice on (but no real feedback). Another good (but tough) case is Lower GI - Part 2, Case 9
* **Advice**: Remember that this is a video game, not a physical loop in a physical scope. I think the “game” is that when you realize you’re no longer making forward progress, you’re supposed to stop advancing, and then slowly withdraw (+/- give clockwise torque) and eventually you’ll “lurch forward” which is the video-game’s way of saying you reduced the loop. The key is that this is slow, subtle, and boring. Nothing exciting here. I just tried and tried and tried and eventually the scope would advance as I was pulling back and I got past it.
* **Test Day Notes**: This is actually 3 parts, each are short with a 3:20 time limit per case. The only “instructions” are just to go and navigate to the cecum. You’ll know you pass each case if you get to the point of seeing text in the lumen that says “advance to here” or something like that. All three cases are similar-ish. In reality one is probably sigmoid flexure, one is probably hepatic flexure, and one is probably a floppy sigmoid. But again, it’s just a video game. Don’t over think it. Pull back and torque until the scope advances. The practice case will give you a sense of the feel. Bethany - got ⅔, very frustrating

1. **Retroflex Navigation**

* **GI Sim**: **Fundamental Skills Module - Task 7**
* **Practice Goal**: < 3 minutes
* **Test Day Notes**: The test is harder than the sim b/c the background is white (less visual context) and the targets are not raised like they are on the GI Sim requiring far more precision that the GI Sim. There are only 6 or 7 of these. I think I had 5-7. Supposed 1 min time limit between each. Didn't take that long to reach them. Bethany - I had 7 targets. Go slowly to increase precision. The practice module was super useful

1. **Mucosal Evaluation**

* **GI Sim**: **Fundamental Skills Module - Task 5**
* **Practice Goal**: < 4 minutes...but the real test is less about time and more about finding those pesky things.
* **Test Day Notes**: The test is harder because the spots are yellow (and thus harder to see than the big red splotches on the GI Sim). Also, they are ALL behind mucosal folds. Sort of too hidden if you ask me. Testing proctor mentioned seeing anywhere from 4-6. Monica found 4, John found 3, Mario found 4.
* JWS - “I was hoping to pull back to about 30cm on the scope and then re-advance to look for missed ones, but the case timed out when I reached 30cm on the scope (This was at about the 3:00 mark). So, I guess there are supposed to be around 5 hidden targets between the start and 30cm. Was tricky.”
* Bethany - I found 4 and was told there were 5. In addition to the targets, you are tested on mucosal evaluation. I pulled back all the way to 31cm then readvanced completely. Took the entire time but did not actually find any more targets the second time through

1. **Targeting Polyps (with a tool)**

* **GI Sim**: No dedicated module yet (expected in Q4 of 2017)
  + However, **Lower GI - Part 1, Case 6** is a good start as this has a pedunculated polyp to be snared and a mass to be biopsied, so you get used to using the “instruments” (but no real feedback)
* **Test Day Notes**: On the actual test, was somewhat tricky. I think I had 7 targets. The colon is mostly straight (like the funnel alignment skill). You don’t have to open/close a tool, but you do have to insert, advance, touch the target, and then withdraw between targets so that you don’t hit the mucosa. This is semi-tricky, but fortunately you don’t have to open, close, and yank biopsy forceps. The depth perception is difficult, though, I’d recommend you get pretty close to the targets because they always ended up being farther away than I thought. Bethany - my wrist hurt a little by this part and hand was a bit shakey. Still got through the 7 targets but hit the red rings a ton. Try not to advance the tool too much for better control and again take your time for precision

**Cognitive Test**

* You get 90 minutes to take 80 questions on the computer. You can’t go back and check yourself. Most folks take about 45 minutes to finish it. Some folks say that they went through the FES online modules once and breezed through this part
* The test is supposedly going to test you on the following domains (so the below high-yield notes are structured accordingly):
* **Module 1: Technology**
  + Which solution you should use for irrigation.
    - sterile water
  + You need to know how to troubleshoot the equipment. For example, know what to do if the suction or video doesnt work:
    - No light at distal end?
      * 1. Light source plugged in and turned on
      * 2. Light source ignited
      * 3. Not in “standby” mode
      * 4. Lens at distal tip is dirty
      * 5. Bulb burned out
    - Out of focus?
      * 1. Clean lens (fiberoptic scope)
      * 2. White balance
    - No irrigation?
      * 1. Bottle contains water
      * 2. Bottle connected to umbilical cord
      * 3. Connection tight
      * 4. Lid of bottle screwed on tightly
      * 5. Power turned on
      * 6. Valve stuck or occluded
    - No insufflation?
      * 1. Umbilical cord firmly seated into light source and screwed in if necessary
      * 2. Power turned on
      * 3. Valve stuck or occluded
    - Clogged valve or nozzle?
      * 1. Take valve apart and clean
      * 2. Flush channel of endoscope with cleaning solution, followed by clean water
    - Unable to pass instrument in channel?
      * 1. Make sure the correct size of the instrument for working channel
      * 2. Ensure the instrument is closed
      * 3. Decrease tip deflection
  + You need to know how the scopes are cleaned
    - Routine: “high level disinfection” = gluteraldehyde
    - Sterile: (but overnight cycle) = ethylene oxide gas
* **Module 2: Patient Preparation**
  + You need to know how to position your patients
    - ERCP (prone)
    - colonoscopy ( LL dec)
    - after APR (?supine)
  + You need to know about medically challneging patient populations, such as patients on dialysis
    - You should know when to do endoscopy in regards to their HD days
    - You should know which bowel prep is safer for sick patients (like CKD, CHF, etc)
      * Isoosmotic = polyethelene glycol (PEG)
        + Safest for all sick folks (CKD, CHF, Childs, Lytes off)
  + You should know about the risk of electrolyte imbalance with sodium phos
    - MC side effect = hyperphosphatemia and hypokalemia
      * High Phos and Low K
      * HyperPhos risk worse in kids
      * Dont give to CKD, AKI, CHF, ACS, Ileus, Ascites, sick kids
  + Which patients hav the highest risk of infective endocarditis?
    - Prosthetic valves, prior endocarditis, syst-pulm shunts, cyanotic CHD
  + You need to know management of anticoagulation. Including when you do NOT have to stop anticoagulation prior to endoscopy.
    - High risk to bleed = Any time you cut or ablate something
    - Low risk = Dx anything, bili or panc stent w/o sphincterotomy
  + As with any interventions, know which patients are at highest risk for thrombotic events off of AC:
    - Afib + valve
    - Mech mitral
    - Mech + prior thrombus
  + Ok to perform procedures on ASA/NSAIDs if no other risks
  + You show know the Most Common Complications after endoscopy:
    - During C-scope → hypoxia 5.6%
    - Post-Proc bleeding/pain/perf → 0.07%
    - During EGD → desat (70%)
  + Risk of death:
    - C-scope = 0.007% - 0.001%
    - EGD = 0.001%
* **Module 3: Sedation and Analgesia**
  + You should know the differences between common sedatives (for example, midazolam vs valium)
    - Midaz better because
      * Shorter duration
      * Less venous irritation
      * Water soluble
      * More pronounced RETROgrade amnesia
  + Flumazenil is a reversal agent for midaz (versed)
  + Best pain med to use on cKD pt on HD when doing colonoscopy
    - fentanyl/sufentanil
  + Criteria for discharge after colono
    - Stand alone, tol clears, baseline alertness
  + Def contraindications?
    - peritonitis
* **Module 4: Upper Gastrointestinal Endoscopy**
  + You will need to know how to recognize endoscopic landmarks (ie antrum, incisura, duo, transverse colon, etc)
  + Know how to work up a suspected perf after EGD.
    - “If a perforation is suspected, then a water-soluble contrast upper gastrointestinal study should be promptly performed “
  + Know how to do challengeing tube placements such as trying to get a G-tub into a patient with an esophageal mass (Lumen able to fit just 5 mm scope)
    - “A third technique, the Russell approach, may be performed using T-fasteners, a removable introducing sheath, and other equipment that allows access to the stomach from an external approach that does not rely on transoral placement.”
  + You should know the most common indication for an upper GI (bleeding, pain, poor nutrition ?)
  + You should be able to recognize pathology just by seeing photos (ie barrets, esophagitis, esopaheal ulcers)
  + Know when to use retroflexion and what it actually allows you to evaluate
    - Same is true for lower
    - And know what abnormal path looks like for both upper and lower (ie internal, External, Combined Int/Ext hemos)
* **Module 5: Lower Gastrointestinal Endoscopy**
  + Know which gas is used during colonoscopy→ air is used for insufflation not CO2.
  + See above re retroflexion.
  + Know when to screen in specific high risk populations like FAP
    - FAP: start in early teens (upper and lower)
* **Module 6: Performing Lower GI Procedures**
  + You should know when to stop the colonoscopy? When pain meds fail? As soon as patient asks, etc?
  + What would increase the risk of colonoscopy failure
    - Options were chronic constipation, h/o cancer. Abdominal pain
    - I think I marked constipation (thinking maybe difficult to clean the bowel pretty good
* **Module 7: Lower GI Anatomy, Pathology, and Complications**
  + Known how to deal with post-cscope bleeding. For example, if a patients comes back after colono with bleeding and hypotension. Improves after resuscitation. You need to know what to do next.
    - Colonoscopy again?
  + Known how to deal with post-cscope free air. For example a patient with free air after colono. Completely stable what to do next?
    - “The so-called post-polypectomy syndrome of focal pain and tenderness without free air or evidence of perforation on contrast evaluation may respond to conservative management with bowel rest and antibiotics. This syndrome likely represents microperforation or full thickness bowel injury without frank perforation.“
* **Module 8: Didactic ERCP**
  + Brush Bx has a higher cancer detection rate (20-60%) than needle aspiration (6 to 30%)
  + Cut at 11 o’clock using 15-20 J of blend
  + Plastic stents for most things
  + SEMS for unresectable malignancy
  + Hold anti-platelets 10d before and 5d after sphincterotomy
  + If high risk of thrombosis pt on AC, then bridge to heparin and hold 1 day prior only
  + PD in 1-3 o’clock...BD is 11-12 o’clock
  + Pancreatitis is MC complication (3-5%)
    - Avoid using selective bile duct cannulation
    - Limit contrast into PD
  + Stop post-sphincterotomy bleeding:
    - Inject epi
    - Thermal hemosiasis
    - Balloon tamponade
    - Endoscopic clips
* **Module 9: Hemostasis**
  + PEG is better prep if you want to prep for LGIB
  + Argon is useful when you have thin wall (cecum) or broad surface (gastric antral vasc ectsaia)
* **Module 10: Tissue Removal**
  + Know which of the tools can be used to take multiple pieces of tissue during biopsy
    - “Spiked biopsy forceps are commonly employed because they facilitate taking multiple biopsies during a single pass of the forceps without specimen loss.”
  + Know how to remove a serrated polyp at the cecum (12mm)
    - Infiltrate saline and then use a Snare? Other tools as other options
  + ?
* **Module 11: Enteral Access**
  + ?
* **Module 12: Endoscopic Therapies** 
  + You should know in which situation you do (and don’t) have to remove a foreign body with endoscopy. Options will likely present you with an item and a location
    - for example, a pen cap in the stomach, a piece of meat stuck in the esophagus, an open safety pin open in the small bowel
    - “Materials within the small bowel distal to the ligament of Treitz and at, or proximal to, the ileocecal valve are usually not amenable to endoscopic removal, and often require surgical intervention.”
    - ***Take Out:***
      * Free FBs in the esophagus
      * Ingest FBs in the stomach...don’t HAVE to come out unless they are irregular in shape
      * FBs stuck in the rectum or sigmoid
  + Know the benefits of using argon coagulation in the colon (esp compared to the other options)
    - Lower risk of deeper thermal injury leading to perforation

**Passing/Failing**

* You will find out your test results 7-14 days after the test via e-mail.
* After you take it you will likely feel like you failed
* \*\*\* passing written vs manual skills ? You only have to retake the portion you fail
* \*\*\* How to re-take? First retake is free