Audio Companion for SESAP® 16
ABDOMEN — Category 4

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The following faculty report no relevant financial interests: Drs Jeffrey G Chipman, William W Turner, Jr., Daniel Vargo, and Travis Webb.
Utilization of Mesh Products More Technique-Dependent than Product-Dependent

Biologics: The biologics category has become relatively stable. There are some additions to some of the products. There have been some antibiotic coatings added to one of the products, but for the most part, we are still looking at products that vary based on where they come from — whether they be different animals or human — and the different amounts of processing those products undergo before they are packaged and sold. While biologic companies would like you to believe there is going to be a difference from one product to another, some of the heavily cross-linked products definitely did not work, did not incorporate the way they were supposed to, and did not transition into normal tissue the way they were supposed to. Of the current portfolio on the market, they are almost interchangeable.

Utilization: Utilization of these products is more technique-dependent than product-dependent, at least with what currently exists, whether a product is minimally cross-linked or not cross-linked. These types of products can be utilized safely in the appropriate clinical situation, and you need to focus on meticulous technique when you utilize those products. You need the ability to make sure you are trying to get these products into a well-vascularized space. Right now, we favor putting these products in the retrorectus space so that you have vascularized tissue both above and below the product itself. It seems like these products perform better in that environment.

Tips to Implanting Mesh Products

When you are going to be putting in a biologic, it is typically a situation where somebody may already have infected mesh in and you are taking it out and looking at and then redoing a hernia repair, or you are doing it in a situation where somebody maybe has a hernia associated with a stoma takedown and you do not feel comfortable putting a prosthetic mesh in that situation. The main trick is trying to preserve that posterior rectus sheath and transversalis fascia inferiorly when doing that dissection and being very careful to try and meticulously get in the plane between the mesh and the sheath when you are taking it out. If you were to end up putting any sort of holes or anything in that sheath when you are taking things down, then make sure you close things up and then from generating enough length within that space, elevating the skin and the fat off of the anterior sheath to actually unfold the rectus muscle is helpful. When people develop hernias, at least in my experience, the medial border of the rectus muscle tends to roll upward and it tends to shorten the width of the rectus muscle. It is always impressive to me, when you take 5.0 cm of skin and fat off the top of the rectus complex, how much that muscle unfolds then gives you a bigger space posteriorly when you open up the medial border of the posterior sheath. There is much more space to implant mesh. These are the cases I would currently be doing open.

Biologic Implants: For biologic implants, though, there is definitely a movement afoot to be able to do these procedures either laparoscopically or robotically now for some surgeons. Case: The patient who has had an ostomy on one side of his abdominal wall and then comes back in for the ventral hernia repair. Do you have any tricks that you use on those patients?

Tips: If I am going to try and do the same operation with putting mesh into that retrorectus space, it is not so much a trick for me as it is to just try to avoid any sort of contamination of that space. I tend to over sew the stoma on the outside, divide on the inside of the abdomen with a stapler, and then open that space and try and dissect everything out and get the stoma out with having minimal contact of bowel with that space. In that situation, when you close the posterior sheath of the transversalis fascia, you can put a larger pore prosthetic mesh into that space safely. I do not think you are committed to using a biologic in a stoma takedown. That is definitely a heated debate with people who evangelize on one side or the other, but there are no solid data that say you have to use a biologic in that situation.
Bioresorbable Prosthetic Mesh: New Category, PTFE Available

There is an entire new category of bioresorbable prosthetic mesh, and there are a few companies who are marketing these slowly resorbing meshes as something you can utilize for ventral hernia repair. It is actually a very interesting concept. The theory they are utilizing is you do not need mesh there forever and ever; you just need to be able to generate a reasonable scar plate to be able to repair a hernia, especially if you are doing primary fascial closure over the top of the mesh, which is the technique now recommended for all hernia operations — to reapproximate the midline over the top of the mesh. These companies ask why give the patient a lifetime risk of having a mesh infection when you can implant something that is going to be around for 9 to 12 months and then completely resorbed.

PTFE Resurgence: There is an effort to eliminate some of the pitfalls of PTFE mesh. The main pitfall for PTFE is that it is encapsulated, and surgeons end up with large, non-revascularized tissue sitting in the anterior abdominal wall which, were if it gets infected, becomes a real mess. Ten to 15 years ago, surgeons tried to deal with this by putting grooves into it and trying to cut little holes in it, but they were never really successful in addressing the idea that the repair was basically supported by sutures and mesh and was not supported by any sort of living tissue. They are definitely trying to make some changes and trying to get back into that space. Again, there are not any real solid data right now with regards to some of the newer materials they are coming up with and newer ways of utilizing PTFE, but it will be interesting to see what happens.

Tips for Management of Infected Mesh

Pore Size: The pore size debate has been addressed. There was a paper presented at the American College of Surgeons in October by the University of the Carolinas with regards to pore size. The main thing you are looking at with pore size is what happens if it does get infected. This study showed the highest salvage rates with infected mesh with the lighter-weight, larger-pore-size mesh. They were able to salvage about one-third of those by techniques such as antibiotics, drainage, and negative pressure wound — from a salvage standpoint, the lighter-weight, larger-pore-size meshes definitely are advantageous.

Case: A patient presents with infected mesh, and you explant the mesh. Do you have to take everything out? Do you just take what you think is not incorporated? How do you manage that patient when you unfortunately are on the receiving end of the patient?

Recommendations: There is an opportunity to try to manage this without a large operation, which is the first step. Then, for some patients, there is no doubt the entire piece of mesh needs to come out. The patient had a 6” × 8” piece of mesh put in his abdomen. He has a 6” × 8” wound on his abdomen that is draining purulence, and you obtain imaging to try to assess what is going on. Both sides of the mesh are infected and there is not really a good way of draining it, so the treatment is pretty straightforward. You are going to go in and take all the mesh out, cool it off, and then end up re-repairing their hernia a couple of days later. If somebody has draining sinuses or small wounds with a little piece of mesh at the base of it, I would take the patient to surgery and do a smaller debridement, making sure I have controlled all of the infection in that area. Then, I would use some negative pressure wound therapy on that. I think everyone deserves at least a chance especially if they have either a lightweight-type polypropylene mesh or a polyester-type mesh. The meshes that absolutely cannot be saved are the bilayered meshes, the meshes that have PTFE as the backing with some polypropylene on the front, and some of the older meshes. Based on the Carolinas’ data, they were not able to salvage any of these meshes by any of the conservative measures, and all measures ended up needing to be explanted. I think part of it was based on the extent of the infection and the other part was the type of mesh implanted at the time of the hernia repair.
Factors Affecting Infections Following Mesh Surgeries

Bilayered Meshes: Right now, we do not use any bilayered meshes, and I do not recommend anybody use bilayered meshes. We will use coated meshes to try and prevent adhesions, especially for putting the mesh intraperitoneally.

Infected Mesh: We put mesh in ventral hernia repairs and we put it in inguinal repairs, but there seems to be a difference in the patients we see back with infected mesh. We rarely see them in the inguinal area, and we often see them in our ventral hernia repairs. The only reason I have seen given for this difference is the difference between putting mesh between 2 vascularized layers — which really is what you are doing when you are doing an inguinal repair. If you are doing an anterior-based repair, you are closing the external oblique fascia over the top of the mesh. Underneath, you have well-vascularized muscle versus placing mesh intraperitoneally, which is sitting on top of the perineum on one side that is relatively well-vascularized, but on the other side you may have omentum sitting there that is not very well-vascularized. As we theorize about why that happens, this is about the only thing really different about the 2 procedures from a physiologic standpoint, and I think it is one of the pushes for trying to put prosthetic mesh into the retrorectus space with the idea that this mesh position might decrease the incidence of infection and also might improve the chances salvaging a piece of mesh if it does happen to get infected. Outside of that, I have not heard another really good explanation for why we rarely see a piece of infected inguinal mesh.

Is Watchful Waiting Still the Answer?

There have been a couple of recent publications that have extended watchful waiting to 7 to 11 years afterwards, and the crossover to surgery has definitely increased significantly in these patients. Is there any detriment to waiting the extra number of years before operating on those patients?

Recommendations: In his data, Fitzgibbon had 3 patients who needed an emergency operation because of strangulated hernia. Based on this, I do not think it is dangerous to continue to watch those patients, but I think we have to be more realistic about whether those patients are going to ultimately develop symptoms or not. For me, this has changed the way I approach a younger person who has an asymptomatic or minimally symptomatic hernia for sure with the idea that, if a 25-year-old comes in, the likelihood after 10 years that he or she is going to need surgery is at 70% or so. If this is the case, I am probably going to be more liberal in offering that patient surgery. It has not changed my approach, though, to the more elderly patient who has an inguinal hernia. If a 75-year-old comes in with a small asymptomatic hernia, he is not going to benefit from having an operation because you are not preventing a complication with regards to incarceration or strangulation. I have changed my practice based on some of the follow-up data presented.

Concerns for Younger Patients: My only concern with operating on the young patient is the long-term pain aspect. I think the evolution of this whole topic with regards to how we present things to patients is very interesting. When you started to talk to a 25-year-old 5 years ago and tell him he did not need to have a hernia operation, he was shocked. Most of the time, he had been sent in by his primary care provider; who told him to go see a surgeon to have his hernia fixed. Now, it is not so much of a concern, as data from the surgery literature from 6 or 7 years ago have gotten to primary care providers. They are now telling their patients they do not need to have their hernias operated on, but they seek out a second opinion from a surgeon who is now telling them they probably should have the operation. Now, I have patients telling me they were told not to have surgery because all these problems associated with it, and I have to give a balanced perspective in the other direction.
Making Surgery Choices in Younger Patients

**Case:** A young patient does opt for surgery. What is your approach to a first-time inguinal herniorrhaphy — Laparoscopically? Open? How do you do that?

**Recommendations:** I will present the patients with the data for both laparoscopic and open. The recurrence rates are essentially the same for the 2 procedures as are the complication rates. The long-term pain issues are essentially the same for the 2 procedures. The only advantage to doing it laparoscopically is the recovery time is somewhat shorter. There is a tendency among surgeons — I do not know if this is actually based on literature — to allow people to get back to normal activities quicker when we do procedures laparoscopically. I will present that thought to the patient, and I will let him make a decision with regard to the approach the patient prefers. Of course, this is considering the patient is someone who could tolerate a pneumoperitoneum — not bad COPD, not somebody who would not tolerate general anesthesia, or someone who has one of the contraindications actually having a laparoscopic operation. I am finding most people are opting to try and have the procedure laparoscopically. I will do mostly TEPs with a rare TAPP if somebody’s had that space violated before. My approach is to stay totally extraperitoneal and not go intraperitoneal.

**Contraindications:** If the patient has had a deep pelvic surgery with radiation and the radiated field was near one of the groins, then I find the potential adhesions from bowel and the tissue planes problematic. It makes it very, very difficult. There are not many patients who fall into that category. It used to be that retropubic prostatectomies would be contraindications to doing a laparoscopic repair, but I do not find that to be an absolute contraindication.

**Foley Not Necessary if Bladder Empty**

My practice is not to use Foley catheters for lap inguinal herniorrhaphy. I will have patients void before surgery and then go ahead and do the operation. There are rare situations where I will have men who have significant prostatic hypertrophy tell me it takes them five or 10 minutes to try and empty their bladders and that they have frequent urination. In those patients, we will end up putting a catheter at the beginning of the case because they just do not completely empty their bladders for the procedure. Everybody else we will have void beforehand with the understanding that some of these folks will not necessarily be able to void after surgery and may need to be catheterized after surgery.

**Anesthesia:** For the laparoscopic procedures, we are using general anesthetic. For open operations, I leave it up to the patients whether they want to go to sleep for surgery or they want to do a sedation-based procedure. The majority is done on an outpatient basis.

**Hernia Reoperations Becoming More Difficult**

If you look at the literature, the results of doing a primary hernia repair have stayed pretty consistent. The recurrence rates are the same now as they were 10 years ago. With some of the mesh products that have been used for repairing hernias, it has made reoperating on hernias a little bit more difficult and requires surgeons do a little bit more investigating before we do the procedure. The examples are the bilayered inguinal hernia meshes — if somebody has an anterior approach hernia repair but the operation is in the preperitoneal space. Traditional teaching was that, if somebody had a scar in their groin, then their second operation yielded 3 tiny scars in his midline doing the procedure laparoscopically. But now, if you do not do an adequate investigation of what that patient has done previously, then the reoperation can be a surprise because you end up with a large piece of preperitoneal mesh you were not necessarily expecting.
**Case:** A patient is scheduled for outpatient herniorrhaphy and you have done it open. As you are getting ready to send the patient home, he has a large hematoma in his inguinal wound. What do you do?

**Recommendations:** I think if somebody has developed a large hematoma prior to discharge, that patient is going to end up going back to the operating room to get his wound washed out and reclosed after trying to identify the bleeding source. I think this is no different than a bleed after a breast biopsy or a bleed after doing something in the neck — all of these require you as a surgeon to take them back, wash them out, and close them back up. You know the reason for that, at least for me, is 2-fold.

One, I want to identify the source of bleeding. I do not want to send somebody out with an enlarging hematoma and have him have a significant problem. But secondly, the potential the downstream wound issues from leaving a large collection of blood is not worth the risk of just watching it and waiting for it to resorb. If that wound does get infected, you have mesh sitting underneath that now becomes at risk of getting infected, so I think it is prudent to take those patients back and wash out those wounds.

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**Postop Pain a Major Concern Following Procedures**

There has been some literature presented about doing nerve transections at the time of doing both open and laparoscopic procedures in hopes of ensuring pain is not a problem. The long-term results from those types of adjuncts to the procedures have not really shown a benefit to doing a nerve transection at the time of the operation. If the iliohypogastric nerve is sitting right in my face while doing an anterior repair and my mesh is going to be sitting right on top of the nerve — it is not a functional nerve — I tend to transect that nerve at the level of the internal oblique muscle I do not want to put mesh on top of the nerve like that. This is not literature based, but, to me, it is not going to hurt the patient and maybe it will help later. I think it is really important to get the sheaths of mesh to lie as flat as possible. Anytime we get ridges in mesh, you can get chronic inflammation from those ridges that can cause prolonged pain after surgery. I utilize as minimal fixation as possible. Typically, for laparoscopy I will not use tacks unless somebody has a large direct hernia, then I might put 2 or 3 tacks around the defect itself. Avoiding the triangle of pain, obviously, is important if you are going to use fixations during laparoscopy. During an open repair, it is important to utilize minimal fixation to the conjoined tendon to try and minimize the number of stitches transfascially in that area. These are main things I try to do to avoid long-term pain with hernia repair.

**Glue:** I do not have any experience using glue to put in mesh. I honestly do not have a lot of background because it is not something a lot of us do. I know it is done frequently in Europe. From a results standpoint, as far as the repair remaining intact, glue is absolutely a viable alternative to putting in stitches. I do not have, unfortunately, a lot of information or background at what the long-term pain results are with using glue.

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**Groin Pain Postop: What Should Be Concerning?**

**Case:** You have a patient in whom you have done a laparoscopic repair. He comes back for his 2-week follow-up complaining of groin pain.

**Recommendations:** This is typically what I call the “handholding visit” — a visit where I tell patients that a hernia operation is still an operation and people recover at various speeds. Although the patient may have had a friend, brother, uncle, or father who said he was riding the tractor 3 days after his hernia operation, not everybody is in that situation. I tell the patient 5% or 10% of patients take longer than 2 weeks to recover from a hernia operation. I tell him to give it some time and see what happens.

**The Case Continues:** The same patient comes back in 4 weeks and still has groin pain.

**Recommendations:** In 4 weeks, again, there is probably a bit more handholding, but I would definitely show more concern about something long-term potentially happening with regards to the hernia
operation. At the 4-week follow-up — I would typically see somebody back who continues to have pain between 4 and 6 weeks — I talk about the healing process taking between 3 and 6 months for all of the inflammation associated with the surgery to resolve and if you get out to about 3 months and are still having discomfort, then we will start to look at possible reasons. I will ask some specific questions at 4 weeks about what type of pain the patient is having. There is definitely a difference between somebody having a nerve-related, neuroma-related type pain where they suddenly develop a shooting, electric shock-type pain versus just routine after-surgery pain. If somebody comes in at 4 weeks with shooting-type pain; that is definitely going to change the way I think about the patient over the course of the next month or 2.

Medication: If the patient can take nonsteroidals at this point, I will definitely use them. The other thing I try is to get them off of narcotics because, if they are going to turn into a longer-term pain problem, getting them away from narcotic pain medications is important — maybe using something like tramadol plus nonsteroidals plus maybe Tylenol; some people will add in gabapentin or something along those lines, but at 4 weeks I would never try that.

When Are Nerve Blocks Necessary?

If a patient presents with electric shock-type pain, I would consider doing a nerve block even at 4 weeks if he is having symptoms. If he is not having what I consider to be nerve-based pain, then I would not do a nerve block at 4 weeks. This patient is someone I am going to see back at about 3 to 4 months after surgery. Then, if he were having symptoms at that point, I would try to determine whether I think it is secondary to the mesh or secondary to a nerve injury and make a decision about doing blocks versus further studies at that time.

3-Month Follow Up: If the patient does not present with an appropriate clinical picture for a neuroma or a nerve-type based pain, I am not going to offer the patient surgery at that point. If somebody comes in with nerve-based pain and I am able to do a nerve block with a successful outcome, then I will offer a triple neurectomy to that patient with the understanding that about 85% to 90% of those patients are going to get better from undergoing neurectomy for that type of pain specifically. If it were somebody who does not have that type of pain specifically, then I would probably consider utilizing a pain specialist to see if the specialist can use some alternative methods to try to control the discomfort that the patient is having. If it is myofascially based, there is some physical therapy that can be done and some stretching that can help to deal with the scar tissue in that area that might be causing the patient pain. If the pain truly is becoming long term and the patient is going to need some sort of modulation of his spinal cord reflexes and things like that, the pain specialists are going to be much better at managing that than I am. Occasionally, I will get a patient back from our chronic pain specialist saying, “Would you please consider taking this patient’s mesh out because we need to take it out of the equation as something that might be causing them pain?” In that situation, I will go in and take the patient’s mesh out to see if that helps the pain. In my practice, I see 1 or 2 patients a week with some sort of pain after hernia operation. I will offer a neurectomy to maybe 10% to 20% of those patients for trying to resolve symptoms because they cannot fit the pattern of somebody who has nerve pain. Probably about 10% to 20% of those patients will ultimately end up at some sort of mesh removal in an attempt to either prove or take it out of the equation as something that is causing pain after surgery.

Triple Neurectomy: For triple neurectomy, my approach is an open approach with groin exploration. There are some people who are doing this operation laparoscopically, which I think is an interesting idea, but I can make a 3-cm incision right by the anterior superior iliac spine and find both the iliohypogastric and ilioinguinal nerves at that point. I make a small split in the internal oblique and transverse psoas muscles and drop it in the preperitoneal space. It is very easy to find the general femoral nerve on top of the psoas muscles. I can do that entire operation through a very small incision.
For me, I do not see a lot of benefit to doing this operation laparoscopically, but I know that there are people who do it.

**Sports Hernia: Physical Therapy or Operation?**

A sports hernia is an unfortunate name for a clinical condition. I tell my residents in clinic and the students who come with me to clinic that it is the worse named entity in medicine because it does not have to be sports-related and it is not a hernia. I think the unfortunate part about it is there are so many different entities that get lumped into the category of sports hernia. In my mind, these are all different entities that exist within the pubic/inguinal region, and there is actually a term for it —is what some people are utilizing for nonhernia inguinal pain. The entities I think about that contribute to this entire spectrum of disorders is the true “sports hernia” where you do have weakness of the inguinal floor, bulging of the inguinal floor, and a compression of some nerves that goes along with that; patients do have symptoms almost identical to a hernia. They just do not have a hernia in the medical sense where they have a hole in their fascia. These people will typically have pain when you palpate their inguinal floor. The pain is reproduced when you palpate their inguinal floor. If you have a skilled ultrasonographer who knows what to look for with the standing and with Valsalva, you can see definite bulging of that floor that is fairly significant. This is 1 entity I think falls into sports hernia. The second big entity we see is issues at the pubic tubercle itself. I use the analogy of tennis elbow, where you have multiple entities that insert under the pubic tubercle, and the pubic tubercle itself gets inflamed. The myotendinous units that attach at that area get inflamed. The adductor tendons that attach in that area get inflamed, and those patients present with very, very different symptoms than the “classic” sports hernia patient does. They have groin-associated pain in their legs. They have palpable pain right at the pubic tubercle when you evaluate them. If you get an MRI of these patients, they have bone marrow edema along the pubic tubercle, and they have stress fractures in that area. The rectus muscle may light up. The conjoint tendon may light up. The tendons in the adductor complex may light up. These patients do not benefit from surgery but need physical therapy. They need to be evaluated for muscular imbalances, but rarely will that patient actually benefit from having an operation.

**Diagnostic Interventions:** Ultrasound and MRI are the main modalities we use. Ultrasound of the inguinal region is so much better now than it was even 5 years ago. I think there is an understanding within radiology — and there is a whole literature that has been developed around doing dynamic ultrasound studies specifically of the groin — that you ultrasound looking for occult hernias or for sports hernias. This is diagnostic test of choice. The follow-up test if patients do not fit the pattern for true sports hernia or if they want to pursue further imaging because the workup for inguinal floor problem was negative, then an MRI is the next test.

**Surgery and Medical Treatments of Sports Hernias**

**Posterior Weakness:** If a patient presents with a posterior weakness, there is a European surgical approach where they basically do the equivalent of half of a Shouldice repair. They suture the floor and, if they identify the general branch of the general femoral nerve, they will clip that nerve at the same time. If the tissue quality looks good, I will tend to do a Bassini repair for those patients because I do not necessarily think they need to have a piece of mesh implanted. These are young, healthy people who do not have hernias, and you give them the risk of longer-term complications of putting a piece of mesh in when you are not really actually fixing a hernia. I think tissue-based repair in those patients has been shown to actually work and work just fine.

**No Posterior Weakness:** There are a lot of different things that are tried in patients who do not have posterior weakness. I will put those patients on nonsteroidals if they can take it — 600 mg of ibuprofen
Are There Right and Wrong Ways to Manage Midline Incisions?

Ventral herniorrhaphy is another topic that seems like it comes around every 10 years or so, that there is another new or different way we are supposed to be managing our midline incisions to try and decrease hernias. In the 1980s, we were doing retention sutures on everyone, and we thought that was going to stop hernias only to find out it basically killed the abdominal wall and increased the number of hernias we had. About 10 to 15 years ago, the 4:1 ratio looking at suture lengths was important as far as how we were closing wounds, and now lots of small bites is how we are supposed to be closing abdominal wounds. I think at the end of the day the principles we need to think about when we are closing a midline wound is that we are closing a tendon, and tendons take a long time to heal. In regard to other areas where people have tendon work done, they put that area to rest. If you get a tendon reattached in your finger, people do not let you use your finger. If they do allow you to use it, it is very passively. We are closing a tendon up with big stitches and telling people to cough and to breathe deep. We give them narcotics that make them constipated and then Valsalva to have a bowel movement. Until we come up with a better way of trying to manage the area that has to be utilized after surgery, I think we are going to be stuck with at least a certain percentage of hernias. There is talk about hernia prevention by adding adjuncts to our closures in addition to just our suture techniques. People are talking about utilizing mesh or something else as part of a primary midline fascial closure. It is an interesting concept. I do not think it is ready for primetime yet, but again, I think it is interesting looking at higher-risk patients and higher-risk closures that may be adding an adjunct in addition to using really good technique when you close 8-mm bites. It is something worth examining.

Reinforcement With Mesh: There are not many negative studies in the literature regarding reinforcement with mesh. There are some positive studies. It makes sense after a retrorectus placement of a piece of mesh to put an extra piece of mesh on top of or underneath your closure. This is where the bioresorbable field is positioning itself in the hernia prevention category. If you take a product that is only going to be there for 6 months and it helps to support your closure so that the midline has a chance to heal, it might be something that would be worth considering. Right now, I have a hard time with treating everybody to fix a problem that shows up 10% or 15% of the time.

Midline Incisions Not Always Best Option

There are some disease states and some conditions that we have to use a midline, but there are other conditions we might be able to use a transverse incision in the abdomen to achieve the same thing. There definitely has been some literature that shows the hernia rate is lower by doing transverse incisions. Open cholecystectomies are the classic example of an incision that almost never herniates. When it does, it herniates at the midline if you come all the way to the midline. In my training, I also did a fair number of right lower quadrant incisions to do ileocecal resections for patients. We always talked about the little old lady with the floppy colon in whom you could pull the whole thing out through a small little 3” transverse incision in the right mid abdomen. There are some procedures that probably would benefit
from getting away from the idea that all we do are midline incisions because there is something to be said about well-vascularized tissue around while you are making your closure that is going to potentially decrease the rate of hernia.

**Laparoscopic Repairs Still Have Important Role**

I think there is still a role for doing laparoscopic repairs. Where the laparoscopic repair gets a bad wrap is when somebody takes a 10-× 20-cm defect and puts in a 28- × 38-cm piece of mesh, and they do it with the abdomen fully insufflated. When you desufflate, the patient basically now has mesh lining the hernia cavity. The hernia really was not repaired in the sense of repairing it. There is still absolutely a role, I think, for doing these procedures laparoscopically. You have somebody with a small 4- or 5-cm defect. You can put a laparoscope in. You can utilize techniques laparoscopically to still reapproximate the midline just by using suture passing and doing some figure-8, laparoscopically placing sutures then putting your material in. You have accomplished a reasonable repair. You have a midline closure, and you have it reinforced with a piece of mesh. As the defects get bigger and it gets more difficult to get midline reapproximation laparoscopically or now some people even say robotically, your results are not going to be as good with the bigger defects with regard to reapproximating the midline. I do think as you start talking about putting in larger and larger pieces of mesh, you want to do the best you can to prevent that piece of mesh from potentially getting infected or causing a bad complication downstream. Putting that mesh into the retrorectus space just makes more sense.

**Tips to Managing Patients With Fistulas Following Repair**

**Case:** A patient who has had a laparoscopic ventral hernia repairs presents with a little fistula at the inferior portion of the mesh that has been shown to communicate with the bowel.

**Recommendations:** Surgeons know they have something that is going to cause the patient a lot of grief for potentially a long period of time. I think there are a couple of different ways that you could try to approach it based on whether you think that fistula has a chance to close or not. There are fistulas actually through mesh and there are fistulas near mesh, and it can be difficult to differentiate these. If you have a fistula that is basically right near the center of the mesh and you can look down and you are looking at lumen of the bowel in the center of a piece of mesh, the likelihood this fistula is going to close is almost zero. To put somebody through 6 or 9 months of TPN plus dressing changes to try to get them to heal up is potentially doing a disservice to the patient. As soon as I think this patient is out of the inflammatory phase of healing — usually somewhere between 3 or 4 months after the operation that led to the problem — then I would consider going back in, taking down the fistula, and then re-repairing the hernia. The patient in whom the fistula is near the mesh and I am not certain it is actually involving the mesh and it is in the corner, I will try to manage conservatively. I will try to identify where the fistula is located. I will make them NPO, put them on TPN, and then see if I can get the outputs to go down enough to where the fistula is actually ultimately going to heal on its own.

**Low Output Fistulas:** If patients get down low enough, I will actually start to try to feed them at that point. When they first come in with this fistula, everyone starts off on TPN to give me an opportunity to try to see if I can manage the wound or not. If the outputs go down when they are on TPN, it gives me a chance to clean the wound, and then I will slowly reintroduce some oral nutrition in those patients.

I keep an eye on the outputs and see what happens with the outputs. I do not think somebody needs to be on TPN until the fistula completely closes.

**Negative Pressure Wound Therapy:** In regard to fistula locations, we are trying to get patients out of the acute phase of their problems. We use negative pressure wound therapy, and we all made and cobbled together these interesting little devices and different ways of controlling fistula output,
basically enteroatmospheric-type fistula outputs, when you have fistula going through mesh to try and be able to get the wounds to heal a little bit quicker. There are some new products that will allow you to develop a seal around the fistula and still have the fistula be able to empty out into an ostomy bag. There are a lot of options for being able to use negative pressure for patients who have these types of fistulas. It does actually lead to a much quicker cleaning up of the wound and allows you to treat the fistula as an ostomy instead of having it just kind of draining off into a big wound manager.

Characteristics of Typical Rectus Sheath Hematoma Patient

The typical patient who presents for a rectus sheath hematoma is someone who is older — typically in their 70s or 80s. They are on some sort of anticoagulation — whether it be Coumadin or one of the newer anticoagulants being utilized. There is typically no real predisposing event and, all of a sudden, they develop pain and a lump on their abdominal wall. They come into the emergency room with the idea that they may have a hernia or something along those lines. When you go to evaluate the patient, you feel something. It obviously does not feel like a hernia. You do not necessarily need a diagnostic study. I think as part of the discussion that was had about rectus sheath hematomas, there was something mentioned about the Fothergill sign. We love naming things as surgeons, and so this is a mass in the abdominal wall that does not cross the midline. When people contract their abdominal wall muscles, you can still feel the mass within the abdominal wall. That is the Fothergill sign, and it is something you see with a rectus sheath hematoma.

Managing the Typical Rectus Sheath Hematoma Patient

Part 1: A patient presents with the diagnosis of a rectus sheath hematoma.

**Recommendations:** If you have the opportunity, you definitely want to hold or reverse anticoagulation. It is watchful waiting at that point. If the hematoma is not necessarily changing, then you do not need any further imaging at that time. If it looks like the hematoma may be getting a little bit bigger or even if there is truly a question with regard to the diagnosis itself, I would utilize a vascular-phase CT scan to look for extravasation. If you see ongoing bleeding from that area, there is potentially a role for looking at some sort of vascular intervention, though I would not necessarily jump to that. I would try to make sure the patient is not continuing to be anticoagulated. I may apply some pressure to the area where the hematoma is located. As a last resort, if somebody continues to bleed, I would think about involving some sort of interventional vascular person to try and manage it.

Part 2: In the same patient, you get a CT scan, the anticoagulation is being reversed, and there is a blush on the CT scan. The patient is hemodynamically normal.

**Recommendations:** At our institution, we do not give this patient another dye load to embolize the vessel. As long as somebody is hemodynamically normal, we would watch him in a monitored situation. We would follow his hemoglobin or hematocrit serially. If there were a continual drop in the hemoglobin or hematocrit, we would end up getting interventional radiology or vascular surgery involved. I think a blush does not necessarily mean you need intervention.

Part 3: This thing has gotten fairly big, although the patient has stayed hemodynamically normal.

**Recommendation:** The only time I would drain one of these is if there was evidence the skin over the top was being compromised because of pressure. Part of the problem while trying to drain this is that it is not typically a collection of blood. It is blood dissected throughout all of the muscle in this area. If something has gotten big enough that it is actually starting to compromise — if we get into the little old lady with the thin skin over the abdominal wall that could be compromised relatively quickly — then I would potentially go in and try to decompress whatever solid clot exists in that area. I can honestly say that, in the 16 or so years I have been at Utah, I have had to do that one time. Sometimes it
is very discouraging because you get in there and the clot has made its way around the entire muscle. It is almost like you squeeze on the muscle and hope some of the red cells have kind of squeezed out like you are wringing out a washcloth.

**Study Examines Relaxing Some Duty Hour Requirements**

The study Dr Karl Bilimoria and his group at Northwestern put together examines relaxing some of the duty hour requirements. I am at an institution that participated in that study. We were in the study arm, so we were able to relax our duty hours a bit to allow people to stay and do procedures if they had taken care of a patient or come back to the hospital to take care of problems. I honestly think the way the first trial was set up was more like what practice is going to be like for a general surgeon. I give the researchers a lot of credit for looking at the issues with regard to continuity of care and patient safety with handoffs, while also looking at what a practicing general surgeon is potentially going to have to do — stay after the next day when you have been operating that evening on a bad diverticulitis or some sort of surgical problem. You are going to have to come back to the hospital to take care of a patient after a long day at work because you have had a problem and have to go back and re-operate on that patient. I like the fact they really did organize the study and set up the study in a way that mimics what a general surgeon does in real life. I can say from experience within our own program and from results of this study, residents felt less stressed in the experimental group. They did not have to deal with the idea they were leaving work for somebody else or they were leaving a patient because they could not stay to help to take care of that patient. There was definitely more of an ownership component to the patient. It was not as much of a shiftwork component, so I think there were definitely some positives that came out of that. The tradeoff was that people in the experimental group felt they had somewhat of an impact on their ability to do things outside of the hospital, so there was a little bit of a negative that came out of it with regard to spending time at home or with family. I think that is the real life of what we do as general surgeons. Our jobs do have an impact on our lives and our families. I like the way the study was done, and I know that they are going to follow-up these data over the course of the next 5 years. Dr Bilimoria is going to continue to look at the programs in the study group, and we will continue to collect data. We will see if there is durability to the findings.

**Approach to Adhesive Small Bowel Obstruction Has Changed**

The diagnosis and management of small bowel obstruction secondary to adhesions has undergone some updates and changes. The historic concept of never letting the sun rise or set on a small bowel obstruction is passé, I would say, but the overall management strategies remain pretty constant for the past several years as far as the focus on non-operative therapies and then falling back to operative therapy as necessary.

**CT Imaging:** CT scanning has been part of the change as well, as it has become much more prevalent. We are using CT scans much more commonly. I think the reality is, though, we don’t know exactly when and how to use those scans. All too often our emergency medicine colleagues will pull the trigger on getting a scan prior to our involvement, when in reality many of those patients probably do not need to be scanned and could just be managed based on the clinical diagnosis and some plain x-rays of the abdomen. The scans are pretty sensitive and specific but certainly not 100%, and much of the information gathered with the scan we probably do not even really need to manage the vast majority of our patients.
Abdominal Series X-Rays Important

**Case:** A patient who has had a previous laparotomy presents with nausea and vomiting. He has a plain x-ray that shows dilated loops of small bowel. Do you get any special x-rays on this?

**Recommendations:** It is important to get an abdominal series to look for C-loops and those J-loops because, quite frequently, we will be able to differentiate the diagnosis of ileus versus bowel obstruction just based on that. Getting 3-view films of the abdomen upright, the diaphragms and the plain flat plate supine is where I want to start.

**Case:** In the same patient, you see J-loops consistent with small bowel obstruction.

**Recommendations:** You must differentiate the patient with an acute abdomen, but if the patient does not look systemically ill or septic and does not have an acute abdomen presents with J-loops on his film and he has a story consistent with a small bowel obstruction, I would stop there with my evaluation and head toward management.

How to Incorporate Transition Point of Obstruction

**Case:** A CT scan is obtained that shows a patient with a transition point of obstruction. He has history of previous laparotomy. How do you incorporate that finding into your decision tree?

**Recommendations:** One of the challenges we face is there are all sorts of different descriptions. Where we hear a lot of variation is in the description of partial versus complete versus high grade or low grade. There are some variations in how those are described in practice, but for the patient who I hear has a transition point, I think, “Well, that’s wonderful. I think we’ve made the diagnosis,” but then of course I do want to know — since I do have the information in the scan — about some of the other more ominous findings on CT scan that would be concerning for potential strangulation — mesenteric stranding, free fluid within the abdomen, bowel wall edema, pneumatosis, a swirl sign or a whirl sign. Barring any of those concerning findings — some of which I do not always know what to do with — I would continue on with a treatment strategy of fluid resuscitation, placing an NG tube, and close observation.

Determining Surgery Need After NG Tube Placement

**Case:** An NG tube is in place, and you have got fluid going. Do you have any tricks to help decide whether or not that patient needs an operation?

**Recommendations:** I want to see pretty rapid clinical improvement of the patient upon placing that NG tube. If I get the NG tube in and nausea improves, abdominal pain improves, distention improves, and the patient is feeling better — his biggest complaint is that he has a tube in his nose rather than he is having abdominal pain or nausea and vomiting — then I feel pretty comfortable about nonoperative at least early management. The patient complaining of a lot of pain or vomiting around the tube or complaining of nausea after placement is the one that I am very concerned will probably not be resolved with just nonsurgical therapy.

**Watchful Waiting:** The old adage of the sun should never rise and set on a small bowel obstruction is passé. This is where the data have certainly convinced me. It is still coming in with regards to the use of either Gastrografin or some sort of a contrast material to be given to evaluate for evidence of ongoing obstruction. The data pretty clearly show us some sort of a contrast material such as Gastrografin can be used early on. Now, the question is how early, and I would propose that is somewhere between 6 to 24 hours, or 6 to 12 hours after initial NG tube placement. You can give an oral challenge of contrast material, and then evaluate within 24 hours as to whether you have transit of that contrast material into the colon. If the contrast material is in the colon within that time period, you have an extremely high likelihood this is going to resolve without any kind of therapy. I do think people are pushing the
envelope a bit as to what to do exactly once they see contrast in the colon. People have all sorts of ideas as to how to manage NG tubes. You could argue to just take the NG tube out at that time. I think you can be fairly aggressive and pretty confident that, if you do see contrast material transited into the colon at 24 hours, you are going to be pretty safe. If they do not resolve within 48 hours, the likelihood of bowel obstructions resolving without an operation has dramatically decreased. You are going to get pushed to do an operation if you do not see either contrast in the colon after 24 hours or if you have not done that study. If you just waited 48 hours you are probably going to be in the operating room.

**Obstruction Possible in Patients Without Prior Operation**

**Case:** A patient presents with an adhesive small bowel obstruction but has not had an operation on his abdomen. Does that occur? If so, how do you handle that?

**Recommendations:** It certainly does occur. I have operated on a handful of patients who have never had a true intra-abdominal operation but do have some sort of adhesion. In most cases I have seen, it is from some sort of an inflammatory process in the abdomen that led to a little omental adhesion, maybe diverticulitis or maybe an attack of appendicitis that resolved. Anytime I see someone who presents in that manner, however, I do worry about what is going on in the abdomen. I always worry about something more sinister such as a tumor. I would argue that anybody that comes in with a virgin abdomen with a bowel obstruction should be treated initially just like any other bowel obstruction — so NG tube and decompression. Once he has improved, then my approach is to do a diagnostic laparoscopy and evaluate what is going on in the belly — run the entire small bowel. I have certainly removed several small bowel tumors over the years when approaching these patients in that manner.

**Failure of Nonoperative Management**

**Case:** Nonoperative management fails. When patients ask how often non-operative management fails, what do you tell them? How do you start operative management?

**Recommendations:** When I discuss the plan with the patient at the outset as I am trying to get him to agree to an NG tube, I usually tell him the risk of non-operative management failing is between 15% and 20%. When we have looked at data from our institution, our failure rate has been a little bit higher — over a couple of years it has been closer to 25% or 30%. My typical approach is to assess clinical response. If a patient truly decompresses nicely and does not have a distended abdomen the day after decompression, I would not operate. I usually use a Gastrografin contrast study to help me decide whether I am going to operate on somebody. If it has not passed to 24 hours, I am pretty aggressive about saying I need to operate. Depending on how the abdomen is looking at that time, I will either approach this laparoscopically or open. I think it is safe to do laparoscopically; however, I think the failure rate is fairly high. I think it depends on your own level of expertise and interest in running the small bowel and your ability to do that safely. You do always have to be concerned about injuring the small bowel. When it is thinned out or dilated, it is very easy to put a hole in it laparoscopically.

Be very careful and diligent in that approach; I would not fault anybody for jumping straight to a laparotomy, but I think if you have the desire and the willingness, laparoscopy can provide decreased morbidity if you can successfully treat it in that manner.
What is Best Approach for Distended Abdomen in Elderly?

**Case:** An elderly patient presents with a distended abdomen. You want to fix it laparoscopically because of the decreased morbidity of getting into the abdomen. Do you choose a different site? How do you choose that site? What trocars might be useful to this patient?

**Recommendation:** Again, everybody has their own opinion and their own comfort level with getting into the abdomen laparoscopically. I have shifted to using a 5-mm OPTIVIEW port in the left upper quadrant just subcostal right underneath the rib cage in pretty much anyone who has had a previous midline operation and especially in somebody who is morbidly obese who has had a previous midline operation. I found that to be an extremely safe approach, and it can even be used in this situation in which you have a fairly distended abdomen. I have become very comfortable with that, but I can tell you it took me a couple of years before I was really comfortable with it. While I think everybody has to figure out their own approach, I think trying to go through a previous midline incision periumbilical incision is frolicked with peril. You are really running the risk of popping right into a piece of small bowel, so I really try to stay away from the midline when I am getting into the abdomen.

Risk of Incisional Hernia: Making Patients Aware

**Case:** You have a patient in whom you are about to do a laparotomy. You have a discussion with the patient about the complications of midline laparotomy. How do quote the risk of ventral hernia in that midline laparotomy?

**Recommendations:** I would question whether our readers always quote a risk of incisional hernia; however, I tell patients at high risk for incisional hernia that complications are a very high likelihood. Complications of incisional hernias historically rate pretty high, probably higher than any of us want to think. I think in the STITCH trial the rate of incisional hernia was between 13% and 21% depending upon the closure technique, and that was just at 1 year. So I think it would behoove all of us to discuss the high likelihood of incisional hernias in the vast majority of our patients.

**Minimizing Risk:** I am a very strong proponent of the technique described in the STITCH trial of using a basically a 4:1 ratio of closure with a 2-0 PDS suture using a small needle so you are looking at very small bites, 5-mm to 8-mm bites from the edge and in between each stitch. It takes a little bit longer to do, no doubt. It is more tedious, no doubt. But, as they were able to show in that randomized, controlled trial — and I can tell you anecdotally as well — surgeons have been very happy with the success of those closures. Everyone should take a very close look and make a personal decision as to what technique to use, but I think everybody should be doing this type of closure at this point.

**Effects of BMI:** More data should be garnered on the effects of BMI. Personally, I use this technique for everyone, and I recognize the trial was for patients with elective operations whose BMIs were not extremely high. I have incorporated this into basically any and all patients; in the morbidly obese patients as well as in the emergent operation, I use the same closure.

Closure of Rectus Muscle With Separation of Fascial Layers

**Case 1:** You get off the linea and have separation of your fascial layers with the rectus muscle exposed. How do you accomplish this closure?

**Recommendations:** Once the anterior and posterior rectus sheaths have been opened, I do want to get both anterior and posterior and exclude the muscle from the bite. When you are using the small needle, it is not difficult to do with these small bites. You can get both anterior and posterior fascia — some people have argued necrosis occurs and can cause problems when you take a large bite of that muscle — then try to exclude any of the rectus muscle in that bite.
**Case 2:** What if you have a very high-risk patient who has multiple reasons to either have wound disruption or eventually just develop a ventral hernia? Is there any role for retention sutures these days?

**Recommendations:** This topic I have strong feelings about. I do not use retention sutures, and that is a pretty unilateral statement. I do not use retention sutures for a permanent closure. An exception is that I do use retention sutures in the setting of the open abdomen on which I am doing sequential closure. I like to use a dynamic retention suture with take backs every couple of days to close an abdomen. As far as the abdomen that I am thinking I am permanently closing, however, I do not like to use retention sutures. I know there are a lot of people that still do, but the risk of wound complications remains extremely high regardless of whether you use them, and the pain associated with them is quite high, so patient satisfaction is quite low. And then just the wound care — the cellulitis that occurs, the maceration of the skin — has pushed me away from using retention sutures.

**How to Place Dynamic Retention Sutures**

The retention suture device with which I have always been associated actually crosses the wound. Some people like to use other types that stay on, that run parallel to the incision. I do not think it matters much. There are some devices commercially available that make dynamic retention suture placement a bit easier. I have not had the privilege of using those devices, but I have certainly bought into using those — using some sort of a retention suture to provide that medial traction on the abdominal wall in the damage-control situation. The other aspect I like to use — and I think this was initially described by a group from Colorado — basically uses a combination of a VAC system with retention suture. I actually use a VAC drape underneath the retention sutures and then use the VAC foam kind of in between the retention sutures and have basically a combination of the VAC temporary closure with retention sutures to provide that medial traction.

**Suture Material:** For this, I use a larger suture and usually a 1 PDS on a large needle so I can go quite lateral with my sutures and all the way through the abdominal wall. Any kind of a large material can be used.

**Closing the Abdomen: Damage Control**

I have a standard routine of how often I take back that open abdomen as I am trying to get the wound closed. I like to do every other day. The literature would support every 2 or 3 days. I think you need a standardized approach, and you want to continue that movement toward getting the abdominal wall closed. Many people have argued that if you stay persistent, your likelihood of getting the abdominal wall closed is going to be quite high. If you can get 75% or higher, I think that is reasonable. There is always going to be a patient that you just cannot get closed. We cannot ignore that fact, but I think we can achieve a primary fascial closure in the patient with an open abdomen.

**Case:** You are able to close. You had a 10.0-cm incision and were able to close 2.0 cm right at the top, but the rest is just still 5.0 cm apart, 3.5 cm apart. You are 2 weeks into it. What do you do?

**Recommendations:** In last case I had that was something like this, the patient essentially dehisced the lower aspect of his wound after an episode of coughing about right around 2 weeks out. I ended up having to use a piece of biologic to achieve some sort of closure. When the biologics came out several years ago, I had no idea what to do with them. Now that I have figured out what to do with them, they do save me a lot of heartache in quite a few patients, and they continue to have a role — whether it is a synthetic biologic, a synthetic but absorbable-type of mesh, or a biologic mesh — in those patients in whom I cannot get closed for whatever reason. In the last case I recall, the abdomen was absolutely frozen. The omentum was absolutely frozen to the abdominal wall, and trying to do a dissection was only going to be fraught with complications. So, I made a decision to use a biologic to bridge that gap, knowing at some point down the road that patient would be getting signed up for hernia repair.
Bridges: I can tell you I have done some fancy stuff in the acute setting, and I think I have gotten away with it rather than accomplishing something. Having done a lot of abdominal wall reconstructions in a slightly more controlled environment, I think that burning the bridge in the acute stages is probably not the right thing to do.

Negative Pressure Wound Therapy: In full disclosure, I do use negative pressure wound therapy on closed incisions. I am pretty selective; however, I would be lying if I said that I had strict criteria that I follow, but I do use it in those patients who I think are at high risk. You can go through the literature and pick the variables you want to use. I have been very happy with it, and in some wounds that were at very high risk for either breakdown or some sort of surgical site complication, I have seen very good healing. We need to see more literature to tell us when and where we should be using it. I do not think it should be used routinely by any means. We should be stewards of the healthcare dollar and resources and be careful with the implementation of using the negative wound therapy for those incisions.

When to Remove Negative Pressure Wound Therapy

I use negative pressure wound therapy, but it depends on the particulars of the patient. There are situations in which I do use it — patients who are morbidly obese or that have a large space for seroma or large flaps that I am worried about, those with ischemia, and patients that have had perhaps an enteroatmospheric or entero-cutaneous fistula that I decided to go ahead and close the skin after taking everything down and repairing. Most surgeons will just take it off on a given day — whether that is a 3-day timeline or 5-day timeline. Most will just go by the number of days unless an earlier examination of the wound around the actual sponge shows evidence of cellulitis or other issues that may necessitate taking it off earlier. Usually it is removed on a certain day, and then left off. If you do have a wound that your incisional VAC is pulling a lot of fluid off, there is probably something going on there. I would be a little bit more concerned because there is not usually much coming out at all.

How to Manage the Patient With a Pilonidal Cyst

Case: A young man presents with complaints of pain when he sits down. He has a pilonidal cyst. How do you manage this patient?

Nonsurgical Recommendations: I think this is fairly controversial, and I think this has changed somewhat over the years. My approach to these patients is to try to avoid surgery if I can. I have a discussion with the patient about nonsurgical versus surgical therapy, and I talk to him about nonsurgical options — use of some sort of depilatory or shaving of the area, hair removal, hygiene, and then some sort of a physical correction so that he is not sitting on and disturbing that area every time he sits. Sitting upright and keeping the pressure off that area does provide some relief. I try to get patients to at least try non-operative therapy especially if they are either minimally symptomatic or asymptomatic. I think that should be the first approach. We do not know exactly what the success rate is for that, but anecdotally I have had some success with that.

Surgical Recommendations: If the area appears to have gotten to an abscess, then I think surgical therapy is necessary in all likelihood. With pilonidal disease, we end up needing to do an incision and drainage and then allow that to heal. Then, the vast majority of patients end up getting a definitive excision of that or a surgical definitive therapy at some point. I do push the boundaries a little bit with trying non-operative therapy for this because the healing of these wounds is problematic. They are just stubborn, difficult wounds to heal. If the abscess is drained, the patient is healed, the wound is not erythematous... an excision with a primary closure is my favorite approach. The data are pretty clear that doing some sort of an off-midline incision and closure is going to lead to the best healing and lowest recurrence rate as far as having them primarily closed. I like to do just a small lateral advancement flap
to get these to close just off of midline. If you have somebody with extremely pronounced disease such as a very late-stage kind of sinus tract cyst disease, you are usually stuck with a large wound. These wounds are probably best managed by secondary intension closure. Even though they take a long time to heal, they do not cause a huge amount of pain and the recurrence rate is low. I have followed people for a long time trying to get these things to close in the past, so I pretty much always will try to get a primary closure. I always tell patients that the risk of that primary closure breaking down at least partially is probably about 50%, so I warn them they very well may have a wound that is going to require some long-term care. I have used an incisional VAC on that primary closure back there, and that is a challenging area to get a VAC drape onto. I have used it just a couple of times, and I am not sold on that, quite honestly — just because of the challenge of getting it to stay on there.

Is There a Place for Watchful Waiting in Minimally Symptomatic Inguinal Hernia?

The watchful waiting data — certainly the Fitzgibbons study from 2013 with about 10-year follow-up — have certainly convinced me the vast majority of patients that present with an inguinal hernia deserve my recommendation that they have it repaired. Before that long-term follow-up was available, I think the initial follow-up was around 3 years. I would give patients much more of an option of watchful waiting and seeing how things go. I did note the vast majority of those patients did want an operation at some point. I think the good news from the watchful waiting data is that we know watching is safe, so I am very comfortable telling people we do not have to get this done today, tomorrow, next week or even next month because we know the rate of hernia complication is quite low. I think their data were certainly less than 3%. I am comfortable watching as long as necessary and making this patient-centered, but I do tell them I recommend getting it fixed before it gets too large. It will be easier for both of us. The vast majority of patients then will say it sounds good and figure out a date in the next few months to do it.

Pre-Peritoneal Laparoscopic Repair Procedure of Choice for Minimally Symptomatic Hernia

My procedure of choice in a young male with minimally symptomatic hernia who is ready for a procedure is a pre-peritoneal laparoscopic repair. This is a pretty straightforward operation, and my experience has been very positive. I have a hard time believing the old data regarding recurrence rates from that type of repair because I do not see it in my practice or as one who receives referrals from other institutions. I would like to do a pre-peritoneal approach, and I am fairly aggressive about looking at the other side as well because the risk of having a contralateral hernia is high enough to make me take a good look at that side too. Use of Mesh: In my practice, I have used a macroporous mesh. I have changed meshes and now use a polyester mesh that is macroporous. I do sometimes use a self-adhesive type of mesh in certain situations. I think the key is to make sure you have plenty of overlap or underlap. The size of the mesh in relationship to the size of the defect is going to make the biggest difference in your outcome. Recurrence: In a patient fixed with pre-peritoneal repair who has a recurrence and been symptomatic, I am going to do an open repair. You could take a look at a trans-abdominal type of approach, but in the vast majority of these patients, I prefer to do an open repair. In the patient who is morbidly obese or has some sort of hygiene issue in the groin so that you really do not want to make an incision down there, I think there are options of doing a trans-abdominal approach. It is going to get pretty tricky to do, so I think the No. 1 choice is to do an open type repair.
The Patient Is Female: Does This Change Everything?

Case: A female comes to your clinic complaining of a groin bulge that is symptomatic.
Recommendations: I probably would fall even harder on the laparoscopic approach in a female patient. I really like to do a pre-peritoneal laparoscopic approach on the female, so that I know I have evaluated for a femoral hernia and I know my repair will be covering that area as well. I have had some recurrences of hernias on specifically elderly female individuals when I was doing these, primarily via an open approach. It has pushed me to treat the female patient with a laparoscopic approach because I know I am covering the femoral triangle and fixing any kind of an inguinal hernia as well. When I do this laparoscopically, I divide the round ligament as well. If a female patient presents with a tender mass below the inguinal ligament in the femoral canal, I will do an open repair in most patients. I have had a situation in which I thought I had an inguinal hernia and it turned out to be a femoral hernia. I was approaching it laparoscopically. I was able to get all taken care of laparoscopically, but it was quite a challenge. In the vast majority of femoral hernias, you are probably going to end up needing to treat via an open approach just because of the difficulty in reducing the hernia sac.

Some Situations Call for Synthetic Mesh

Case: That femoral hernia you operated on has gangrenous bowel in it. You have to do a bowel resection, which is done. How do you fix the hernia?
Recommendations: Whether it is a femoral hernia or a regular inguinal hernia, one of the big changes I would say in my practice, and I think a lot of people are again pushing the envelope, is that I am certainly more willing to use a synthetic mesh if necessary especially depending upon the size of the defect. So, if necessary, I do not get terribly concerned about putting a piece of macroporous polyester in the groin after doing a bowel resection. Now, obviously, if there is pus or spillage, then I would not do that, but in just gangrenous bowel and a resection, I am willing to use mesh if necessary. Of course, the old standby of just doing a McVay type of repair, not putting any piece of mesh in there, is something we should all still be able to do and should use as necessary.

Geriatric Patients Present Different Challenges; Outcomes Improved with Prehabilitation

Frailty: Frailty in the geriatric population is something we have been looking at from a research standpoint. Our group has bought into the idea the geriatric patient is certainly a different patient, and we need to figure out better ways to risk assess them and manage them. We have not really bought into, as of yet, doing frailty assessment on all patients. We have been moving toward that, and I expect our group to start to incorporate a frailty assessment on our emergency general surgery patients in order to better assess some of their needs. This will certainly impact our discussions with patients as to the likelihood of being able to go home and the potential for complications after surgery. I am a believer that frailty in some sense is a predictor of outcomes and is something we need to be assessing. I was just taking care of a 92-year-old lady that presented with a hernia. She passed the eyeball test of lack of frailty, but there are other things that could have been done — get up and go test, depression screen, and nutritional questions.
Prehabilitation: Prehabilitation is being talked about in relationship to frailty assessment. I think this will make a big difference in our outcomes in elderly patients. If we incorporate the concept of prehabilitation, I think we will see improved outcomes in our geriatric patients, but it requires a system to get it done. One of the problems we are facing in this area is, just like our primary care doctors, we do not have the time. We may or may not have the expertise, but we just do not have the time and the resources to do these sometimes very in-depth types of histories and physicals and really provide the
diagnosis of frailty, and most of us do not know what to do with it once we have identified it.
I think as more and more people become interested in this, we will start to see more resources and a
better interprofessional collaboration to provide prehabilitation in these patients, ultimately improving
outcomes. There is a lot of possibility of the birth of another subspecialty within physiotherapy with
prehabilitation institutes.

Use of Drugs, Frailty Important Discussion With Older Patients

The *Beers Criteria for Potentially Inappropriate Medication Use in Older Adults* is a list of drugs
with which we should be familiar. We should try to limit the use of those drugs in elderly patients,
but if you scour through your patients’ MAR, most would be taking 1 or 2 of those drugs. Geriatricians
recommend to go low, and go slow. So, if you do have to use one of those drugs on the Beers list or one
of the other lists, starting with a very low dose and slowly incorporating it into their therapy is probably
the best kind of concept and approach. Another element that should be a part of the consent process is
discussion of a DNR/DNI. We should definitely be having that conversation more frequently than we
are regardless if patients are being seen in the emergency room or in the clinic. If I am just taking a lump
off somebody’s back, I may not have that discussion, but if a patient is undergoing general anesthetic,
I have some sort of a discussion about goals of care and DNR status. As a society and as a profession,
we need to become more comfortable with these conversations because the impact of not knowing and
the impact of the unexpected occurring are quite dramatic. As critical care surgeons, it really behooves
us to improve our abilities to have these conversations on a daily basis as a routine part of our
discussions with patients.

Ethics: End-of-Life Discussions for Elective Surgery

**Case:** You have had that discussion of goals of care for the patient, and he clearly states he does not
want devices to extend his life if he has a catastrophic event during the elective surgical procedure.
Lo and behold, that happens. You know what the discussion was, but the family insists everything be
done for their family member. These occurrences are frequent. I think it speaks to a societal issue and
societal discomfort with death and the dying process and end-of-life issues. I can tell you these are very
difficult discussions to enter into, so I think having multiple people who are all communicating the same
thing from a professional standpoint is important — social workers, ethics consults, palliative care
individuals. I think it is important you, as a physician, know the resources and the expertise of the
people around you as well as your own limitations, abilities, and comfort level with these discussions.
Be willing to lean on other people to help you as necessary. I think keeping the patient in the center of
the discussion and keeping the patient’s goals in the center of the discussion are really key, but this takes
a lot of practice and patience.

Preparing Medical Students for Practice

The transition from medical school to actual clinical training is a topic of a lot of concern and a lot of
discussion. Schools need to step up, to take responsibility for assessing the competency of their students
to begin practice upon graduation and supervise practice upon graduation. This is a big challenge and
requires a lot of practicing clinicians to learn different ways of teaching and assessing. It requires
educators to come up with ways to make this as doable as possible. I think simulation can play a role,
but I do not think simulation is the end-all be-all but simply another tool in the toolbox for teaching
instructional methods as well as assessment. Most students are good students and want to learn,
but there are so many pressures from the practice and from society that keep our students from having an optimal learning environment. As educators — at the medical school level and as clinicians or surgeons — we need to keep in mind these students want to learn, and we need to try our best to keep them engaged and provide them with the learning opportunities we would want if we were in their shoes. It is the combination of educational and instructional techniques and strategies with good assessment that is so key, and we have fallen down or have never really had optimal assessment strategies for most of our students and their experiences. That is where I think we need to really beef up our programs. Certainly the medical climate regarding trainees “practicing” on patients is not helping these efforts, and students feel that. Students not being allowed to do things and to not have those interactions are real problems, and it is coming from many different directions. When they are not allowed to put a note into the electronic medical record that is actually going to be visible and used, then the notes they are trying to write seem quite superfluous to them as well as to the faculty and the residents. There are some real barriers hindering our ability to engage our students, hold them responsible or accountable, and really provide them with the opportunity to practice and to learn. We have pushed students into a kind of pigeon hole of disengagement of which we need to figure out ways to re-engage and to help them to feel like they are making a difference. There are ways to do it, but it does take specific effort and some champions to push for it.

Diagnosing Pancreatitis

Identifying Evidence of Gallstones: In order to make a diagnosis of gallstones as the source of pancreatitis, doctors must first identify evidence of stone disease by using any of the imaging modalities or by identifying evidence of a dilated biliary tree. Another identifying factor may be elevation of bilirubin counts. If bilirubin levels are elevated, surgeons may perform a cholecystectomy with an intraoperative cholangiogram. Any evidence of stones in the duct at the time of surgery may be diagnosed with an endoscopic retrograde cholangiopancreatogram (ERCP) while the patient is under the same anesthetic used for the cholecystectomy. This method produces positive outcomes and there is no increased risk of morbidity. However, one must always take into account each patient’s symptoms and enzyme levels before surgery is performed.

Use of ERCP: ERCP is utilized as the primary imaging modality when a patient’s bilirubin count reaches a level of 5, or if the duct is dilated and stones are known to be present based on the ultrasound results in the common bile duct. Most surgeons are not concerned with performing ERCP after surgery. However, in some cases ERCP is required preoperatively. Depending on the skill and accessibility of radiologists, Magnetic Resonance Cholangiopancreatography (MRCP) may be performed instead to make a diagnosis of gallstones as the source of pancreatitis.

Prevention of Post-ERCP Pancreatitis: Although an uncommon practice, gastroenterologists may place prophylactic pancreatic duct stents, which are used to prevent severe post-ERCP pancreatitis. The stents are temporary, usually only remaining in place anywhere from 4 to 6 weeks, postoperatively. Abdominal films are used to determine if the stent is still in place after this time. Frequently, you will find that the stents fall out on their own or migrate through the digestive system. These temporary stents may also be placed in the bile duct once a sphincterotomy is performed.

Hyperlipidemia and Its Relationship to the Metabolic Syndrome

The most common causes for pancreatitis are gallstones and alcohol consumption. The relation of the proportion of each to the cause depends on your location in the country and the settings in which you live. However, hyperlipidemia can be a cause of pancreatitis, as well as hypercalcemia.
Risk of Hyperlipidemia in Intralipid or Propofol Infusion Therapies: The use of fats, either intralipid or propofol, are not particularly associated with pancreatitis, although they may cause hyperlipidemia. Lipid levels must be monitored for patients who are on lipid-containing drug delivery systems. If lipid levels begin to increase above the higher-end of what is considered to be normal, an alternate method must be determined in order to provide the medication. It has become common practice for gastroenterologists to use propofol for ERCP, however, at the University of Minnesota Medical Center, ERCP is done in the operating room under general inhaled anesthesia. Induction is still frequently administered by use of propofol.

Severe Pancreatitis

Practicality of Ranson’s Criteria: Ranson’s Criteria is a set factors used to determine mortality associated with pancreatitis. It was created to identify patients who needed high levels of resources that were not largely available. However, in today’s environment, understanding each patient’s metabolic response to severe injury, and using other types of scores, is equally as good as using Ranson’s Criteria to make the same decisions. In our center, our concern is distinguishing infected peripancreatic necrosis from sterile necrosis. We do not risk-stratify the injury response other than that it tells us what sort of interventions need to be done and when. We do not classify pancreatitis based on scoring systems that describe it as “mild, moderate, or severe”; imaging is used to make that determination. Imaging Patients with Severe Pancreatitis: Diagnosis today is made by imaging. We use arterial-enhanced, contrast-enhanced CT scanning. By doing this, images are obtained of the pancreas during the proper phase of contrast in order to identify a pancreas that is perfused versus pancreatic tissue that is lacking perfusion. In addition, this allows us to look for evidence of peripancreatic fluid collections. Peripancreatic fluid collection can be pancreatic juice, pancreatic tissue that has been destroyed, or peripancreatic retroperitoneal fat that is in the liquefaction process due to injury. We also utilize imaging for finding evidence of infected peripancreatic fluid.

Pancreatic Fluid Collection and Risk of Further Infection: It is important to remember that we are not so concerned about how much of the pancreas is necrotic; we are looking for evidence of peripancreatic fluid collections (which implies necrosis), and the origin of the fluid. If the pancreas itself, or the peripancreatic tissue, undergoes necrosis then liquefies, the body will eventually separate the fluid into an asymptomatic collection that we formerly called “pseudocysts”. If the “pseudocyst” is large and symptomatic enough, the peripancreatic fluid collection becomes infected and results in another potential stress to that patient. In some cases, necrosis can lead to a disrupted pancreatic duct which must be addressed usually after the acute event is resolved.

Preventing Infection in Patients with Pancreatitis

Vigilance in Detecting Infection: The vigilance in distinguishing when sterile necrosis becomes infected necrosis is very important, as this is the division in the pathway of the disease. Infected necrosis needs to be drained because at that point it is an abscess. If left untreated, it will result in infectious spread, inflammatory response, and sepsis; all the things we know about uncontrolled infection. Antibiotic Use in Infected Necrosis: Antibiotics are needed in most cases of necrosis, however, if administered too early, evidence tells us that poor outcomes occur. This results in drug resistance to the bacteria that are present elsewhere, and may eventually be the causative bacteria that results in infection later on. Antibiotics are not always appropriate, however, we know that if a patient does have an infection and is left untreated, it becomes more problematic. Because of this, distinguishing infected from noninfected peripancreatic necrosis is pertinent in the early stages of diagnosis in order to administer effective treatment.
Aspiration of Peripancreatic Fluid: For the patient who does not have air in their peripancreatic fluid, but has a significant inflammatory response, fluid aspiration may be required, especially if there are concerns about that patient’s physiologic response that would lead us to believe there is infection.

There are a number of approaches that would enable access to the fluid. One risk to be aware of is creating a pancreaticocutaneous fistula by improper placement of a drain. In order to avoid this risk, it is best to approach the fluid collection through the retroperitoneum percutaneously. In our center, gastroenterologists frequently use endoscopic ultrasound and sampling techniques to look for windows through the stomach and the duodenum to access peripancreatic fluid endoluminally. There is some risk of contamination, however, drains are placed in the fluid collection to drain it into the lumen of the intestine or stomach. This approach is similar to that of a cyst gastrostomy. We try to wait as long as possible so that the stomach, or the walled-off necrosis, is as isolated as possible and that the adjacent organ, like the stomach or duodenum, is plastered to the inflammatory area without separation.

Double pigtail catheters are frequently used; if the space is large enough, a type of dumbbell stent may be used. This approach seems to work pretty well for us and reduces the risks associated with surgery for these patients.

Drainage in the Critically Ill Patient

Case: Hypothetically, a patient presents with a peripancreatic infection. CT scans show air is present, and the patient is not doing well. In the past, the patient would undergo an open laparotomy. However, today we would drain the infection endoluminally as long as the patient is fairly stable. If endoscopic drainage is not viable, the next approach would be laparotomy and open necrosectomy, then drainage. There are some data that conclude percutaneous drainage might afford the surgeon more time; in up to 50% of patients, this would be sufficient.

Pancreatic Debridement in Necrosis: For the peripancreatic necrosis that may not be amenable to an endoluminal approach, but is amenable to a percutaneous retroperitoneal approach, drains can be placed in the operating room. Wires are then placed through the drains and a dilating set (eg, renal dilator) can be used to open a track to allow a trocar and a laparoscope into that area. For example, one could place as large of a trocar that is appropriate into the area (eg, 15.0 mm). After the trocar has been placed, a smaller scope can be placed through the trocar, as well as a small grasper, so the area can be debrided manually. However, we try to avoid doing that here in order to avoid the risk of creating a pancreaticocutaneous fistula. The most important part is that you get the infection opened and drained. After removing the trocar in that setting, the tissue will need to remain open through some sort of tube to facilitate the body’s natural response of drainage.

Acute Management of Severe Pancreatitis: The long-term prognosis of patients with severe pancreatitis depends on the extent of the gland that was destroyed. Some will develop diabetes; another outcome would be a disconnected pancreatic duct, including the central portion of the pancreatic duct; those patients will require a drain. If the area can be drained internally, it may be adequate to go into the lumen of the gut. If the area is not able to be drained internally, and if it is to the skin, a distal pancreatectomy will be required, which can be a tough operation. This is performed through a flank incision, however, the peritoneum is frequently entered. I will often proactively take the spleen at the same time as a safety precaution and to complete the operation with minimal bleeding. Specific ligation of the duct is the best way to manage it and prevent leakage or fistulas. Other procedures and methods, such as glues and stapling, do not affect the overall management of the duct like a distal pancreatectomy can.
Chronic Pancreatitis

Presentation of Chronic Pancreatitis: Patients who have chronic pancreatitis present to the general surgeon when there has been ongoing pain with multiple interventions by the gastroenterologist (repeated pancreatic duct stents, attempts at drainage, evidence on imaging of extensive duct stones, and evidence for dilated ducts). The University of Minnesota has a history of performing total pancreatectomies with islet autotransplants early in the process of treating chronic pancreatitis, therefore they are presented to the general surgeon early on.

Standard of Care: Most of the patients that present to the University of Minnesota receive total pancreatectomies with islet autotransplants. We feed them enterally as soon as we get them by attempting to place nasoenteric tubes as far past the ligament of Treitz as possible. Occasionally a diverting procedure or a drainage procedure will be done, when necessary. As far as pain management goes, although celiac blocks can be used to manage pain in the abdomen, they are not used as primary treatment at the University of Minnesota.

University of Minnesota Islet Auto-Transplant Program: The islet autotransplant program was pioneered by Dr. David Sutherlands, in 1974, at the University of Minnesota. The operation is similar to the Whipple procedure, in which a small portion of the pancreatic gland is removed. Dr. Sutherlands’ technique involves removing the whole gland, including the spleen. Over the years, we have learned that leaving the spleen intact results in gastric varices later on. To bypass these complications, we proactively remove the spleen. In the pancreas, the gland is then cannulated through the pancreatic duct and then perfused with saline. Next, the gland is sent to a lab on our campus where the islet cells are separated from the pancreatic glandular tissue. The cells are washed and then delivered to us in an IV bag. The portal vein is cannulated and islets are passed through the portal vein where they set up in the liver sinuses. Postoperatively, patients are kept euglycemic with insulin as to not metabolically stress the pancreatic islet cells until they are able to engraft in the liver. Finally, patients are weaned off insulin and about 50% are insulin-free at the end. Results show that 50% of patients are pain free; another 25% of patients experienced no difference in their levels of pain, and another 25% of patients have experienced increased pain. However, the patients who present early in the disease process, and who have less of a narcotic burden, fair better than those who have longstanding narcotic tolerance. We typically put in gastrostomy and jejunostomy tubes to enable us to begin feeding patients enterally.

Diverticulitis: Treatment and Management

Treatment of Diverticulitis: For early pancreatitis, especially those with a Hinchey II classification, a reasonable approach would be lavage, irrigation, and drainage. Patients with higher Hinchey classifications and those who have suppressed immune systems do not respond well to this approach. The approach we take at the University of Minnesota is a conservative one. We treat with the traditional approach of either resection with a Hartmann, or resection and anastomosis with a diverting ileostomy. If the patient’s disease progression is still early on, and the patient is in good health otherwise, lavage may be a better option.

Case: A patient presents with a small pericolonic abscess, associated in the sigmoid. Patient has tenderness in the left lower quadrant and an elevated white blood cell count. The radiologist decides that the window for surgery is too small. If the abscess is small enough (1 cm to 2 cm), and if there is no evidence of fluid spread outside of the area, this patient would be treated with antibiotics and then kept under observation. However, it is important to remember that diverticulitis depends more on the patient than the treatment. If inflammatory changes are not present in the peritoneum or around the area where the anastomosis would be performed, and the abscess or perforation is clearly isolated in a certain area, it is possible that you could perform a primary anastomosis without the protection of an ostomy. Although a diverting proximal ileostomy is inconvenient for the patient, it is safe and not a huge
operation to take down and repair. Long term, patient safety is the most important and conservative way to decide on the most effective treatment.

Splenic Cysts

**Need for Surgical Intervention:** Patients requiring surgical intervention will present to the general surgeon after trauma or because there was some incidental finding on cross-sectional imaging and because the patient is experience symptoms. Symptoms can be vague (eg, right upper quadrant pain), and can sometimes be managed with drainage before surgical intervention. However, there are situations in which the drainage is successful but the symptoms remain and are never fully resolved. In these situations, symptoms were due to the adhesive disease of the cyst.

**Splenic Cysts:** Patients who present with a cyst that has already been aspirated once must be treated with an alternate method of intervention. Patients can be managed either by a process referred to as “unroofing,” or, staples may be used to wall off the cyst to one area. A harmonic scalpel could also be successful in managing this. While literature abounds about unroofing cysts or performing partial splenectomies, it has been my personal experience that these techniques are not always successful and usually result in my removing the spleen altogether.

**Vaccination Before Splenectomy:** For any anticipated splenectomy or partial splenectomy, immunization of patients against the encapsulated bacteria of Haemophilus, pneumococcus, and meningococcus is best practice. Immunization should occur at least two weeks before surgery.

**Treatment of Splenic Abscesses:** There has been discussion in the past amongst the SESAP committee about the treatment of splenic abscesses. In earlier editions, the answer has been to perform splenectomy, however it seems as if percutaneous drainage is now becoming more successful. With any abscess there is a hyperemic area surrounding it. After the abscess has been drained, it is not uncommon for the general surgeon to be involved once the results of the biopsy are complete, but now abdominal pain and a significant amount of intraabdominal blood are present.

Intervention of Idiopathic Thrombocytopenia Purpura

**Presentation of Disease:** Idiopathic Thrombocytopenia Purpura (ITP) presents with mucosal bleeding, petechiae purpura, bruising, and a positive result on serum testing and antiplatelet antibody tests. There is recognition of the benefit of surgery and splenectomy in those patients; although splenectomy is still considered a last option to refractory ITP.

**Patient Response to Intervention:** 50% to 75 % of adults will respond to the initial use of steroids, but long-term results reflect less response. The spleen sequesters the antibody-bound platelet and destroys it. By taking away the “garbage disposal”, some of those platelets may stay in circulation. It is important to note that “long-term” is not well defined; this can be an immediate drop in the platelet count, or it could occur several years later. Some patients with ITP have had difficulty in getting their platelet counts elevated. In these cases, splenectomies must be carried out in the presence of a platelet drip in order to keep some level of platelets going.

**Identifying Accessory Spleen in the Patient With ITP:** In some cases, the presence of an accessory spleen may go unnoticed. These patients may present a year or two later with an enlarged accessory spleen. The patient’s platelet counts had dropped after becoming stabilized following the initial operation, however, due to the levels not reaching a critical level, the identification of the accessory spleen was missed. After performing a splenectomy, surgeons would be advised to search around the tail of the pancreas and in the gastrosplenic ligament for an accessory spleen, but should be careful when exploring the periaortic area so as to not cause damage to the splenic artery or aorta.
Revaccination in Splenectomy Patients

**Need for Revaccination:** The Centers for Disease Control & Prevention has recently released a new set of guidelines regarding revaccination for adults requiring splenectomy. These criteria are set in order to protect against certain infections that occur following splenectomy. The Pneumovax® is one that has differing types of vaccines available with it now; some are polyvalent vaccines, some have 17 serotypes, and others have 23 serotypes. Upon closer examination, we could find that we are missing some, even with the initial vaccination. However, the pneumococcus vaccine should be repeated every 5 to 6 years, and meningococcus should be repeated every 3 to 5 years. The *Haemophilus influenzae* vaccine is believed to be strongly immunogenic and repeat vaccination is not required.

**Postsplenectomy Sepsis:** The risk of developing postsplenectomy sepsis is present in this setting, probably more common in the setting of splenectomy for hematologic disorders, especially in children. It is unclear, based on current literature, whether it is a significant issue in patients who have had splenectomies for trauma. However, when treating patients in my care, I inform them about the splenectomy and that they need to seek medical attention sooner than later when they have a cold or symptoms of a cold. It is suggested that they visit their doctor a day before you otherwise would have. Although there is risk of developing postsplenectomy sepsis, we typically do not treat patients with a suppressive antibiotic, such as prophylactic antibiotics.

Liver Abscesses

**Source of Liver Abscesses:** For the past several years, the training received for liver abscesses has stated that the source has been colonic. While this is still mostly true, we should also look to the biliary tree, and the gut in general, for the source of abscesses in the liver.

**Treatment:** If the liver abscess is small enough, we would treat it with antibiotics. If the abscess is large, we would perform percutaneous drainage. However, with a large abscess, I first find out if my radiologists will be able to perform the drainage. If they are unable to do so, the patient is treated with antibiotics.

**Common Bacteria:** While each institution will see varying amounts of bacteria, some of the more common ones seen are E. coli and Klebsiella; however, it is important to note that this may be particular local politics rather than regional politics.

**Amebic Abscesses:** If it is known that a patient has been in an area endemic with amoeba, a serology can help distinguish diagnosis, as some appear on imaging. If medical treatment proves to be ineffective immediately, a percutaneous drain and sclerosis while avoiding the peritoneal cavity is required.

**University of Minnesota Transplant Program:** The University of Minnesota is home to a transplant program where a large number of people with cystic disease of the kidney and the liver are seen. The transplant surgeons do a wonderful job in dealing with cysts that become symptomatic. They have developed a decision-making tree for the treatment and management of those patients.

Cholecystitis and Biliary Colic

Differentiating between biliary colic and cholecystitis is often difficult if the patient presents in the early stages of disease. The classic acute cholecystitis patient is one who presents with recent onset of unremitting abdominal pain, right upper quadrant pain, and some epigastric pain with or without fever. The patient may also have a history of postprandial right upper quadrant pain or may even have a diagnosis of cholecystolithiasis established due to ultrasound screening or CT scan. Upon physical exam, patients are typically tender in the right upper quadrant and may have inspiratory arrest when examined, or the Murphy sign. Patients do not typically have rebound tenderness. Murphy sign diagnosis may be enhanced by an ultrasonographic Murphy sign, by placing an ultrasound probe over the
gallbladder and having the patient experience inspiratory arrest. On ultrasound exam, a patient with acute cholecystitis may have pericholecystic fluid. Frequently, we see ultrasound diagnoses of thickened gallbladder walls. This is not a discriminatory sign unless the wall is about a centimeter in thickness with obvious intramural fluid, maybe even intramural air. Pericholecystic fluid can be helpful to make the diagnosis and that also segregates the patients who may have leukocytosis upon laboratory evaluation. There is a subset of patients who are relegated into a biliary colic diagnosis who have considerably less degrees of those symptoms and findings. At operation, those patients may have some degree of inflammation that is ascribed to subacute cholecystitis.

**Biliary Colic:** The patient with biliary colic may not present until the pain is resolving or after the patient notes a cyclical behavior in abdominal pain that comes and goes over time. This is also negated substantially by the fact that these patients receive narcotics in the emergency room when they come in acutely and it is never known whether their pain is remitting on its own or whether it has gotten better with the narcotic. However, as a general rule, the biliary colic patients would have pain for a couple of hours, followed by a period of remittance. In contrast, the patient with acute cholecystitis would have unremitting pain.

**Radiologic Imaging Alternatives**

**Advantages of Ultrasound Screening:** The advantage of the ultrasound is that it will detect cholecystolithiasis when an abdominal CT scan does not show gallstones; there may not be enough calcium to show up on the scan. In some cases, one can get a better look at the common duct on ultrasonography than on CT scan. Oftentimes, CT scans will show stones and the diagnosis is made of either biliary colic or acute cholecystitis, however, sometimes there are patients who may have classic symptoms but gallstones are not present on ultrasound or CT.

**Biliary Colic in the Pregnant Patient**

**Consultation for Operative Management:** Operative management of pregnant patients in the second trimester is acceptable treatment after careful and significant discussion with the patient and her obstetrician to be sure the baby will not be harmed during operation or after birth, and also to afford protection for the surgeon. Consultation does not particularly contribute in the patient who has garden-variety biliary colic. It is generally recommend to the patient that they have their gallbladders removed. **When to Treat with Surgical Intervention:** The second trimester is typically when the sentinel event occurs. It is recommended that the patient proceed with having her gallbladder removed. If she is in her first trimester, it is recommended to nurse the patient into her second trimester then perform surgery.

**Acalculous Gallbladder Disease**

**Obtaining Accurate History:** One of the most problematic groups of patients, besides the pregnant patient, are those with acalculous gallbladder disease. First, it is imperative to acquire an accurate history from the patient upon presentation to determine if he or she is actually experience biliary colic. There is nothing more taxing on surgeons and patients than when an operation is performed that does not alleviate symptoms. History is very important as it causes surgeons to eliminate diseases of lesser concern and prohibits needless operations. **Treatment of Acalculous Gallbladder Disease:** Symptoms are typically associated with the completion of meals and pain in the right upper quadrant. These symptoms may be alleviated with operation. Patients are usually not seen before they have had cholecystokinin-HIDA (CCK-HIDA) scans
to assess their gallbladder emptying functions. They are referred to a surgeon when the radiologist suggests that the patient have a cholecystectomy performed. Gallbladder dysmotility is classically defined by an ejection fraction of 35%. This number should be viewed as a threshold and patients can develop acalculous biliary colic with ejection fractions that are higher. Patients may have ejection fractions considerably lower than that and not have acalculous biliary colic. I look at the number and favor the ejection fraction being <35%. An alternative but controversial approach I take is to look into what happened when cholecystokinin (CCK) was injected into the patient. I ask them if they experienced pain with the injection and if they say “no”, I am less certain that removing the gallbladder is going to improve their condition. If, on the other hand, they say the injection caused a lot of pain and duplicated the pain, then I feel certain that I am going to be able to improve them by removing the gallbladder. I prefer to see patients who have not been influenced by testing yet. I then have a discussion with the patient where I ask questions about pain onset and triggers. Finally, I explain to the patient that were she to have gallstones, and if she has had several episodes of typical right upper quadrant pain, I can tell her with >90% certainty that removing the gallbladder is going to improve the pain. In some cases, that chance is not as high, and the chances of removing the pain are lower. At that point, I inform patients what these chance numbers actually mean and how, for the individual patient, this is a 0% or 100% decision.

**Success of cholecystectomy:** A cholecystectomy is successful slightly lower than 90% of the time. In Indiana, our results were about 60% of patients were relieved by cholecystectomy, not including the history of CCK provocation. It did include CCK-HIDA scans where 60% of patients were relieved of pain. Most of the patients whom I care for press me to have their gallbladders removed. At that point, the conversation moves into what I call the diagnostical therapeutic cholecystectomy. I tell them that there are no tests that will yield the results of treatment. If we have reached the point of discussing removing the gallbladder as a diagnostic modality, I discuss with them the laparoscopic operation. These operations sometimes require conversion to open operations, and there are complications that can occur by doing so.

**Acute Cholecystitis**

**Treatment Window:** It can be difficult to determine the length of time that the patient has actually experienced symptoms of acute cholecystitis, translating the findings intraabdominally, and making the determination of delaying cholecystectomies, if necessary. Therefore, it is impossible to place a set window of time on treating acute cholecystitis.

**Antibiotic Use:** We generally prescribe piperacillin-tazobactam peroperatively. In some cases, vancomycin is prescribed for the patient who is very sick. However, with most routine patients, piperacillin-tazobactam is acceptable. Postoperatively, if the patient presents with just some mild inflammation, my tendency would be not to treat them with antibiotics. If they are treated with antibiotics postoperatively, I treat them to effect, and that would be near normalization of the white count. If fever, inflammation and other systemic signs of infection are not present, antibiotic use is discontinued.

**Laparoscopic & Open Cholecystectomy:** In a recent discussion in the ACS and General Surgery News communities, it was questioned whether a patient who presents with severe acute cholecystitis should automatically be prepped for an open cholecystectomy as opposed to the laparoscopic approach. I think a surgeon should do the operation with which he or she is most comfortable with under the circumstances, and that the place where they are practicing best supports. There may be a situation in which you would recommend an open cholecystectomy to the patient. However, in general, we start the patient out laparoscopically and make a reasonable judgment about safely performing this operation. We decide to convert to an open surgery if it appears that you cannot safely do the operation.
**Gangrenous Cholecystitis:** With the exception of the patients who have air in the walls of their gallbladders on ultrasound or on CT scan, you cannot generally make an assessment of gangrenous cholecystitis. This is usually diagnosed by opening the abdomen. At times, you may be able to put a laparoscope in the patient’s abdomen and find the greater omentum, transverse colon, and duodenum under the liver. It can be difficult to determine what it is and if you can safely put your grasper on it. After inspecting the area for a little while, you may see the ominous green and black markings on the gallbladder which is indicative of gangrenous cholecystitis.

**Cholangitis**

**Prevalence:** Because occurrences of cholangitis has decreased over the years, it has become more difficult to diagnose. These patients are being seen more often during consults, in medical ICU, and in other admittance departments in the hospital. They are often treated with antibiotics for a period of time until someone decides that a surgeon needs to be involved in the treatment process. Treatment would include a cholecystectomy with the understanding that there may be need for more treatment in the future.

**Placement:** Most cholecystostomy tubes are placed by interventional radiologists; it would be very unusual to place them intraoperatively. In today’s procedures, we perform a procedure that is a variation of the cholecystostomy: we partially drain the stump of the gallbladder that is removed.

**Management of Tubes:** Currently, our surgeons are seeing these patients at the time they have percutaneous cholecystostomies and are very much involved in their care. While we respect the work and care of our interventional radiologists, sometimes surgeons will see a need and take care of it.

For example, if we see that a tube needs to be replaced or removed, we will proceed with the procedure.

**Decision-Making in Repairing or Replacing Cholecystostomy Tubes:** We are seeing more patients who have had cardiopulmonary bypass with an ischemic, acalculus cholecystitis, who developed acute cholecystitis 3 days after the procedure. An increasing number of people in our institution with left ventricular assist devices (LVAD) who have cholecystostomy tubes placed for acute cholecystitis are extraordinarily high-risk patients for cholecystectomies. A large number of those patients need to have cholecystostomy tubes removed after they ceased showing symptoms. Oftentimes, patients have cholangiograms; however, I think the most important question to ask is whether anything is draining out of the cholecystostomy tube, and if the drainage volume is going down significantly. Many patients can have cholecystostomy tubes removed if the acute disease has been resolved. Alternately, a patient who is previously sick from pneumonia, kidney problem, or soft tissue infections, and who develops cholecystitis, is treated with percutaneous cholecystostomy. Those patients improve from acute disease and are classified as moderate or even low-risk patients. For these patients I would recommend an elective or semi-elective cholecystectomy and to maintain their cholecystostomy tubes in place until they receive those operations.

**Cholecystectomy in the Elderly Patient**

**Determining Patient Safety:** We are experiencing an increase in gallbladder disease in the elderly population. Elderly patients who receive cholecystostomy tubes have the issues resolved, however, they have a list of comorbidities that challenge electronic medical record-keeping. These patients require a good deal of judgment and consideration, and I favor not to perform cholecystectomies. These patients may not even require their cholecystostomy tubes any longer. Oftentimes, they are admitted to nursing facilities and, upon arrival, the tube is removed and not immediately replaced. Then, the decision whether to replace it or not should then be made. In this scenario, I assess the patient and if I think it needs to be replaced, I would consider replacing it prophylactically or perform a cholecystectomy.
If the answer is that they are too infirm to undergo either of these procedures, I would not replace the tube and hope that they do not get another episode of significant cholecystitis that has to be managed during their lifetime. I have never had a patient who required multiple cholecystostomy tubes for multiple episodes of acute cholecystitis, but in some cases, it is a possibility.

**Biliary Pancreatitis and Choledocholithiasis**

In the treatment of biliary pancreatitis, what are the pros and cons of using endoscopic retrograde cholangiopancreatography (ERCP)? ERCP is being used less frequently than before in our approach to managing biliary pancreatitis. This is likely driven by the gastroenterologists who were being inundated with patients who presented with garden variety or near-garden variety biliary pancreatitis and were referred for ERCPs prior to cholecystectomies. We learned relatively quickly that we did a lot of negative ERCPs and subjected patients to some potential and real morbidity. On the other end of the pancreatitis spectrum is the patient who presents with severe pancreatitis who does not act like the usual patient with biliary pancreatitis and does not get well or becomes worse. These patients may need urgent sphincterotomies and transampullary removal of the bile duct stone. A patient with cholangitis also might be managed this way. On the spectrum of pancreatitis, an in-between group of patients presents with biliary pancreatitis that resolves very quickly, either due to disimpacting their stones or passing their stones, as most people with choledocholithiasis do. These “in-between” patients are most commonly handled in our institution with intraoperative cholangiograms and then selective ERCP if intraoperative cholangiogram shows choledocholithiasis. Some surgeons are doing transcystic or even transductal choledocholithotomies, removing common duct stones during the operation. In my practice, I do a lot of biliary operations, but I do not see patients with choledocholithiasis frequently enough to have my operating room or myself adequately prepared to efficiently perform choledocholithotomies. Therefore, I generally refer these patients for ERCP.

**Choledocholithiasis:** Many surgeons whose practices see a lot of biliary tract disease report not seeing many cases of choledocholithiasis. Is the reason for this because we are liberal with performing cholecystectomies in this era of the laparoscopic approach? In our institution, we are doing more laparoscopic cholecystectomies (LCs) because it is perceived to be easy. Even with my residents, performing an LC can be a 25-minute case. Despite the perceived ease of LC, I remind patients that one of the reasons they hire me is because I have seen some of the bad things that can happen and that LC can be a bit of a struggle in some cases. Nonetheless, choledocholithiasis in the middle-aged and elderly patient population is now much less common than it used to be. I am not sure exactly why this has happened. Perhaps because we are not using routine intraoperative cholangiography, we are actually missing patients who have existing choledocholithiasis or who developed choledocholithiasis from residual stones in the cystic duct that fall into the bile duct postcholecystectomy. Regardless, most patients with choledocholithiasis just pass the stones, and we really do not see that as a clinical disease.

**Biliary Colic: Use of Perioperative Antibiotics**

In patients undergoing laparoscopic cholecystectomy for biliary colic, do you give perioperative antibiotics? I must admit that I am an institutional being, and I have found that arguing against the use of antibiotics in this setting has become too difficult. Regardless, the fact is that the Surgical Care Improvement Project (SCIP) criteria that our group follows in this area have been utterly debunked. Nonetheless, I give these patients generally a single dose of cephalosporin or, if they are penicillin-allergic, a single dose of clindamycin. I have my residents read certain papers when they are with me because we do so many biliary tract operations. Some papers look at this whole area and pretty much debunk the value of routine antibiotics in these patients. I somewhat sarcastically say that I believe the
antibiotic is given because these patients have the dirtiest umbilici that I have seen and that I am shocked at how few umbilical infections are seen after these operations. This gives me some solace — believing that I am probably prophylaxing their umbilicus more than I am their biliary tree. I don’t want to be flippant about this. If we do three-fourths of a million cholecystectomies in the United States each year, and if we guesstimate that even more than half of those are elective gallbladder operations, then that is about half a million doses of Ancef for which there is no clear indication.

Gallbladder Polyps: Management

Case 1: A patient presents whose ultrasound shows two gallbladder polyps (one polyp is 7 mm and the second is 8 mm) and no stones. How do you advise a patient with these findings?

Recommendations: I am very aware of what literature discussion we have on this subject. Because I do many of these routine operations with junior residents, I open essentially every gallbladder specimen we take out to show them the pathology, mechanics, etc, of the gallbladder. In this exercise, I have been impressed with the amount of cholesterolosis in the cells lining the gallbladder wall and how frequently I see nascent and existing cholesterol polyps in the gallbladder wall. Therefore, it is very easy for me to understand how most patients who have polyps in their gallbladders just have cholesterolosis, sometimes with very little gallstone burden, perhaps just sand (little bilirubinate pigment grains of sand) and that sort of thing. I get referred a lot of patients found to have cholesterol polyps in their gallbladder walls during all kinds of US exams: the patients are most frequently undergoing routine screening for liver tumors when they have hepatitis C or hepatitis B. If the polyps in their gallbladder wall are <5 mm and located in the fundus of the gallbladder, and if the patient is truly asymptomatic, then I assure the patient that there is very little chance that they have anything here. If they are being regularly followed up by a primary care doctor, I would recommend a repeat US in 6 months. And if that shows no changes in the small polyp in the gallbladder wall, then I would not do anything for it. If there is anything suspicious about the polyp or if the patient is symptomatic, I recommend that the gallbladder be removed.

For polyps >5 mm, then the management decision becomes a little difficult. Polyps 15 to 20 mm in size probably should be removed: most patients with such large polyps are symptomatic. From a medicolegal perspective, polyps 5 to 15 mm in size need follow-up and scanning (US exams). I have a feeling that most of these patients drop out of these protocols relatively quickly. This then becomes a problem because we are trying to find that patient who has a gallbladder carcinoma at an early enough stage that they can be cured. In summary, I recommend one follow-up US exam for gallbladder polyps ≤5 mm; routine US follow-up (perhaps annually) for non-neoplastic–appearing polyps ranging from 5 mm to 1 cm in asymptomatic patients; and cholecystectomy for polyps >1 cm.

Gallbladder Polyps: Adenocarcinoma Management

Case: A patient with a 12-mm polyp in the gallbladder wall undergoes cholecystectomy. The pathology report shows that the polyp was actually a stage T2 adenocarcinoma. How should we proceed?

Recommendations: In my professional life, I have had only one polyp that was an adenocarcinoma, which happened only 3 years ago. I’ve performed thousands of cholecystectomies, so this is a rare problem. Nonetheless, patients with T1B and deeper cancers need to have a partial hepatectomy to basically resect the bed of the gallbladder. They need to have radical lymphadenectomy. They need to have their cystic duct and perhaps the bile duct resected if the bile duct has residual cancer. They often will have various levels of dysplasia and even carcinoma in situ around these foci of minimal carcinoma. The status of the gallbladder lymph node as a sentinel node (Lund’s node) may be of some benefit, but in my practice, I tend to do cholecystectomies by staying on the gallbladder wall and usually leaving Lund’s node in the patient. If adenocarcinoma is discovered in the histologic specimen after a cholecystectomy,
then the port sites need to be resected. Be sure that your pathologist, when dealing with these polyps (especially when they see dysplasia), that they essentially homogenize these gallbladders.

**Cystic Fibrosis in Adults: Impact on Surgeons**

The management of cystic fibrosis (CF) has improved to the point that these patients are living longer, which means they are presenting as adults to general surgeons, not just presenting as children to pediatric surgeons. What problems are general surgeons beginning to see in the adult patient with CF? Through the miracle of modern ICU care and operations, many pediatric problems seen in CF have been brought into adulthood. Their problems exist across a whole spectrum. Incredibly, now more adults than children are alive with congenital heart disease. Indeed, the latest marquee specialty in cardiology is adult congenital heart disease. Therefore, we are seeing adults with CF and congenital heart disease who also have all kinds of general surgical problems. For another example, we are certainly seeing patients who have had various intra-abdominal operations who need treatment for various problems, which is all very relevant to our surgical management. The first really great talk I heard on this subject was by Dr. David Tuggle, a pediatric surgeon. I now tell my residents that, even if they have predetermined that they will never be a pediatric surgeon, they should try to get everything they possibly can out of their pediatric surgery rotation in terms of understanding pediatric surgical problems because these same problems will come back to visit them in their adult patients.

**Distal Intestinal Obstruction Syndrome in Adults With Cystic Fibrosis**

Distal intestinal obstruction syndrome (DIOS) can be an abdominal manifestation of CF in adults in which the intestines become blocked by thickened stool. DIOS develops because adults with CR have trouble with their intraluminal secretion of chloride and fluid, and their sodium channels are too open, thus absorbing too much sodium and water from their GI tracts. Similar problems cause trouble in their pancreas and their lungs. In cases of DIOS, fecal-like obstructions occur in their terminal ileum, which sometimes extend into the colon. Problems with GI tract secretion are linked to an abnormality of the Cystic Fibrosis Transmembrane conductance Regulator (CFTR) gene in these patients.  

**My First Experience:** I became aware of DIOS when one of my colleagues operated on one of these cases and thought it necessary to open the small bowel and resect the section that was occluded with one of these masses of stuff. Unfortunately, the patient developed a water-pot intestinal fistula. I helped engineer a multistage, multiday reconstruction of the patient’s GI tract and abdominal wall. After following up this patient in our hospital for nearly a year, I decided that I did not know enough about this disease and became interested in it. Since then, I have realized that our institution sees many of these cases because we have an active lung transplant program that is keeping patients with CF alive beyond the ICU. Because successful lung transplants increase CF patient longevity, these patients are living long enough to develop DIOS.  

**Management:** In general, DIOS treatment is nonsurgical whenever possible. Instead, we use cathartics and enemas to evacuate their GI tract of these impacted masses, which is usually successful. Polyethylene glycol, PUROL, enemas, etc., can be effective in breaking up the impacted masses and relieving the obstruction. I had a patient who failed this line of treatment and was taken to the OR. Basically, the patient received an ileostomy and his GI tract was successfully washed out on the OR table. He came back in several times with recurrent disease that we were able to manage much more effectively through the ileostomy in terms of washing out his GI tract. He was a lung transplant patient. Because the patient continuously petitioned us to close his ileostomy, we ultimately did that because his ileocecal valve and ascending colon had been resected. The thinking was that, with his ileum connected
directly into his colon, perhaps we would be able to better manage the impactions with enemas than we could before operative intervention.

Narcotic Bowel Syndrome

Patients who develop narcotic bowel syndrome (NBS) are those who are taking narcotics and paradoxically develop abdominal pain. The literature would suggest that there are two versions of bowel syndromes related to narcotic use.

**Opioid Bowel Disorder:** Probably what we are seeing frequently reported and advertised on television is opioid bowel disorder — an individual takes narcotics and becomes constipated. Because so many people take narcotics and because so many people are constipated, they are bombarding our primary care doctors and our gastroenterologists with this condition.

**NBS:** I believe that NBS is a different problem. Patients with NBS seem to have a lot of abdominal pain that we cannot exactly attribute to narcotic use, so they take more narcotics and they do not get any better (some get worse). Some NBS patients do not have constipation, and some have diarrhea. These are some of our postop patients. These patients are reporting pain scores of 12 on a scale of 1 to 10. Hospitalized patients are hounding the nurses about the pain, and the nurses are calling our residents throughout the night asking them for prescriptions for pain medicines. The guideline says that, when a patient has a pain score >8, we must give them a shot of something to relieve the pain. As a result, we just cave in and write more narcotic prescriptions for them so that we can get some sleep. But this sets NBS apart from standard bowel disorder. Added narcotics seem to be associated with increasing progressive abdominal pain in NBS, whereas narcotics just cause constipation in opioid bowel disorder.

**Management:** Treatment for NBS consists of getting patients off the narcotic. Unfortunately, the failure rate (the recidivism rate) is very high. In the few patients that I have treated, the abdominal pain has improved remarkably once the narcotics are discontinued.

Robotics and POEM: Establishing Privilege

How does your institution view the introduction of new technology and establishing requirements for privileging so that surgeons can use it?

**Response:** I think we have learned from our past experiences and are much more prepared to introduce technology and establish sound requirements for credentialing and privileging doctors to use the technology. First, doctors need to appreciate that the new technology, such as robotic surgery, is not just something you can fall out of bed and start doing one day. That’s probably more than half the battle. This means that our institution, including myself, and my colleagues, must come up with ways of trying to set standards for safely establishing privilege.

**Robotic Surgery:** The way we handle robotic surgery at our institution is to first train our residents and faculty on our training robot, which is an old robot. After training on this robot, then the surgeon begins doing cases with a credentialed, privileged preceptor. This preceptor is with them for the whole test and essentially certifies that the surgeon has learned and knows how to use the technology. This is now our standard: a surgeon cannot use a robot unless they have been privileged in it and have gone through this sequence of events. Most surgeons go through 5 cases with their preceptor, but this can vary depending on surgeon competency. Our preceptors know that, if something goes wrong with a future case of one of their preceptees, the preceptor will be dragged into the process of determining why the preceptee received their privilege in the first place. Therefore, some surgeons must complete a few more cases with the robot and their preceptor. The number of these sessions obviously depends on the individual’s training in their residency, their experience with laparoscopic-type operations, etc.
POEM: Establishing privilege for peroral endoscopic myotomy (POEM) may prove to be different than the establishing standards for robotic surgery. POEM is a technique of performing a gastroesophageal myotomy in patients with achalasia using a peroral endoscope. This technology uses the modern techniques that have evolved with submucosal procedures (polyp removals and various other things) through colonoscopes and peroral endoscopes. Via POEM, the circular muscles of the gastroesophageal junction are divided up to circular muscle fibers and onto the esophagus and down on the stomach with an endoscope by making an incision in the mucosa of the esophagus and creating a mucosal tunnel. At least several studies have shown very good results compared to Heller myotomies, obviating the need for any reflux procedure. We are not doing POEMs in our institution right now. If we ever move to that, it will be interesting to discover whether our gastroenterologists will try to become privileged for working with this technology. Institutionally, we will need to establish criteria for them, which might be different than the criteria we establish for our surgeons.