RICHARD WYDERSKI: I'm Rich Wyderski. I have the honor of shunting blood away from your hepatopancreatobiliary gastrointestinal tracts up to your brains. So hopefully I'll be stimulating. Obviously, in 20 minutes, I'm not going to be able to go through every single thing that I can possibly think of to help make things a safer operation. So I hope what I do this afternoon is actually just whet your appetites for further exploration.

What I'm going to talk about is based upon American Geriatric Society and the American College of Surgeons recommendations, joint recommendations on improving patient safety for geriatric patients, which just so happens to actually apply to every single patient we take care of. We have plenty of patients who are not geriatric who we see in our preoperative assessment clinic who we co-manage with orthopedics who are also have a lot of these conditions. Just because you're not 65 or older doesn't necessarily mean you don't qualify for some of the things I'm going to think about.

So my goal today is to simply kind of give you some idea about the way in which we may comprehensively evaluate our patients, optimize some of their preoperative conditions so that we can have a safer operation and reduce the risk of postoperative complications. Specifically, I'm going to list the 11 different areas that the American Geriatric Society and the American College of Surgeons recommend as areas of evaluation prior to a surgery. I'm going to give you some specific ways to decrease pulmonary risk.

And finally, I'm going to show you a really neat surgical risk calculator developed by the National Surgery Quality Improvement Program that's online and available to everybody. And the neat thing about this thing is you can sit at your computer actually in the patient room, print it out for them. They can take it home. So I really like using this a lot. Hopefully you or your staff might be able to use this for your patients as well.

Why? Why do we need to do this? Well, a lot of people are getting older, having surgery. In 2007, 13% of the general population was over the age of 65. Minority of people, but accounting for almost a third-- actually over a third of all inpatient procedures and almost a third of outpatient procedures on a nationwide basis. So older adults have more surgeries.

And it's only going to become a greater and greater number, by 2030, 20% of the population will be over the age of 65. And I suspect that the similar percentage of all operations will be performed on those patients. So having expertise in geriatrics or looking at the patient and see if they fit a physiologic geriatric profile might be something we will need to do more and more commonly to make some surgery safer.

Now, who made up these guidelines? This is not just like Rich Wyderski's guidelines. So this is quite an authoritative guideline. Multidisciplinary panel, including people from surgical oncology, a number of different surgeons, people who have expertise in geriatrics all came together to make up these consensus guidelines.

And I want to emphasize the word consensus. This is not like a majority rule where a number of people who raised their hands happen to be in the majority and then everybody else who is dissenting didn't get a say. Everybody had to agree on each one of these different areas and the recommendations. So it's truly a consensus guideline where everybody had to agree from multiple different medical and surgical disciplines.

I don't have a lot of time to go over each one of these in detail simply because again, limited time. But I want to go over each one. And I'm going to focus on a few of these to show you the importance of a few of them that we don't generally consider too often. In fact, I didn't consider four or five years ago when I was doing preoperative medicine when I started. But a few different areas where it looks like we really do need to focus on these areas because it may predict more strongly than any other factor whether or not somebody's going to have a bad outcome after surgery.

So I'm going to take the first few, the first four kind of together. Cognition, whether or not our brains actually work and can process information is an important thing to have when you're giving informed consent, which, of course, is the cornerstone of every surgery. The consensus panel felt that the Mini-Cog test would be an adequate screen for that, which is simply, can you draw the face of a clock? So you draw them a circle. And they fill in the numbers in the proper order in the proper spaces. And then you tell them what time to put down and they have to accurately put down the time with a big hand and the little hand in the right directions. And there has to be big and little.

It doesn't sound like much. But if you're kind of-- if your brain's not working so well, it's actually a fairly sensitive test for cognitive impairment. You have a lot of different processes that have to work in order to be able to do that's relatively simple task for all of us.

Also three item recall, which is part of a Folstien Mini Mental Status Examination. If they have poor short-term memory, they may not be able to remember, of course, what you just told them, so they can't really give you good informed consent. And decision-making capacity is kind related to that. Can the patient teach back to you what you just told them about their surgery? So if we're going to undergo a big resection for a pancreatic cancer, for example, do they really understand the risk that you could put that you just described to them? Can they even tell you what the surgery is and what it entails?

So some assessment of decision-making capacity. And now we know prospectively the depression actually predicts poor post-operative outcomes. So if somebody screens positive with a PHQ-2 for depression, you may want them to actually seek treatment for depression and perhaps delay things if it's delayable for a time before undergoing elective surgery. The PHQ-2 is simply, are you depressed? Answer yes or no. And do you have fun doing things? Answer yes or no. And if any one of those two is positive for depression, then you should refer that patient on for a more in-depth analysis-- in-depth counseling and intervention. If it's an elective enough surgery, you may be able to postpone things and help improve their outcome.

Delirium risk, I'm going to go into more specifically. Delirium actually increases the length of stay of your patients postoperatively. It predicts an actually increased risk of 12 month mortality. I think of delirium as acute brain failure. Just like when somebody develops acute kidney injury or acute liver injury.

Delirium is your brain is not working after surgery for some reason. You've developed acute brain failure. And that has downstream implications as well. So we want to assess risk and whenever we can reduce the risk of developing delirium as well.

Alcohol and substance abuse. It's amazing to me how many of my patients who are little old ladies still have their three, or four, or five cocktails per day. So doing some screening for alcohol, since, after all, if they abruptly stopped after surgery, they may actually develop alcohol withdrawal syndrome or worst case scenario delirium tremens. So we do want to do some screening for alcohol use, at least abusive if not true alcoholism.

Functional status, mobility, fall risk, and frailty, I'm going to go into in a little bit more depth in just a moment. Nutritional status is something that I have never learned in medical school and I got very little training in through the rest of my career. And I presume that's probably the case for almost all of us here in this room. So doing some type of nutritional assessment, preferably with a registered dietitian or a nutritionist, to decide if the patient needs to be optimized nutritionally prior to surgery may help improve their postoperative outcome. Their functional outcome as well as their other risk of developing infections and other complications.

Cardiopulmonary assessment I'm going to go into in a little bit more detail. Medication management, we need to look for polypharmacy. And the ones I really hone in on for older adults are things that make your brain not work right. So, for example, my mother took Valium when she was in her 50s. And she kept taking it until probably her 80s and probably should have stopped it 20 years sooner.

Valium is one of those benzodiazepines that actually increases the risk of falls and increases the risk of impaired cognition. And especially postoperatively when your brain's already taking a hit from the inflammatory state of surgery, your risk of delirium would be increased if you continue to take your benzodiazepine in the preoperative time frame up until the time of surgery. So definitely looking at that.

Anticholinergic medications. Lots of older women especially take anticholinergics for bladder spasms. Increases the risk of delirium.

So we really want to look at the medications, try to see what is necessary, what's not necessary. In the preoperative assessment clinic, we look at diabetes medications. We look at any hypertensives. We don't want the person to be hypotensive in the operating room. Rather have them even a bit hypertensive in the OR to maintain organ perfusion. So we want to counsel those patients beforehand to help reduce the risk of complications.

Counseling, also very time consuming. And this doesn't have to be done by a physician. But looking at what is the patients goal. If they're an older adult or a younger adult, do they really want to have a major surgery if their goal is to simply maybe make it to next year to go to their grandson's graduation, for example? What is the goal of care? Do they really want to go through a major operation? Or are they simply just kind of doing this because it seems to be obligatory to do so?

Looking at advanced directives. If they haven't executed a living will or a MOST form here in North Carolina, then doing so may help further define what they would or would not do if they did have a major complication postoperatively. Kind of doing the guessing game when it's a crisis situation is usually not the ideal, as we all know. I'm sure we've all been in those kind of crisis situations over the years.

Looking at social supports. Who's going to be with the patients postoperatively? Looking for family support is important too.

And I'm not going to really go into preoperative testing, but just the general comment that we do too much of it. There is really not a lot of pre-op testing that actually makes a difference postoperatively. The American Geriatric Society and the American College of Surgeons specifically do recommend a hemoglobin level because anemia optimization, which is beyond the scope of this talk today, can help improve postoperative outcomes by avoiding transfusions. A basic metabolic panel to look for electrolyte abnormalities and to look for kidney function. And finally, an albumin level.

And I never knew this until I started really doing perioperative medicine, but albumin actually predicts a lot of bad outcomes. If you have a low albumin level, you have an increased pulmonary risk. And it's probably a marker for nutrition, as well as since it's a kind of a negative acute phase reactant, a low albumin may be a sign of chronic inflammation that may further increase the risk of postoperative complications.

So that's really kind of the musts of these three. And everything else is kind of tailored to the individual. So we don't necessarily need to get a chest x-ray and PFTs for every patient that goes to surgery.

Delirium risk assessment. There is only one tool that I know of. And I've read a lot of reviews since I started about five years ago. This one was published in 1994 based upon data in the late 1980s and early 1990s. Marcantonio derived and validated this tool that showed that people who were over the age of 70 automatically had an 11% risk of developing delirium. And every one of those other factors simply just increased the risk all that much more.

So some of these obviously are just not alterable. For example, you can't change your age or you can change your own cognition. You may be able to alter preoperative electrolytes or their glucose, optimize their diabetes to help reduce their risk.

It's also important for me to counsel my families about whether they're at risk for delirium. Simply because if they are at risk and they get delirious, if families aren't expecting it, that really leads to really lots of strife. I've been through way too many episodes of strife. So letting them know what's going on, and what the potential is for it happening, and what to expect afterward in the preoperative setting can really help a lot in the postoperative setting.

I'm not going to look too much at pre-op cardiac risk assessment because I'm already running out of time. Other than the old RCRI is out and the NSQIP calculator, which was derived and validated in the same methodology on the basis of hundreds of thousands of people that were entered into the NSQIP database as the modern version of the RCRI.

The only thing that this calculator predicts is either death or myocardial infarction, two of the most important complications that we deal with in the postoperative setting. Don't know what to do about it yet beyond the scope of this talk today. The American Heart Association ACC guidelines, of course, have their own recommendations for what to do in a preoperative setting to reduce risk.

Unfortunately, like one researcher that did five different studies of beta blocker in the preoperative setting got fired for academic fraud from Erasmus University in the Netherlands. So there went a lot of our positive data on beta blockers. So we do know how to assess risk. What to do about that risk, still kind of not quite sure yet.

Now, pulmonary risk is one I want to hone in on because there are lots, and lots, and lots of things that increase pulmonary risk of complications. Either pneumonia, or respiratory failure, or both.

Lots of patient-related factors. If you're older, you automatically are at risk. If you're between ages of 60 and 70, your risk is twice as much as people under the age of 60. If you're over the age of 70, your risk is four times as great as people under the age of 60. So pulmonary risk simply by age itself. And then add in any of the others and you simply just keep increasing the risk more and more. Most of the operations that you're all going to be doing are probably going to be prolonged surgeries as well of over three hours.

So what can we do to reduce risk? Preoperative pulmonary incentives spirometry. And I never thought about this before this guideline came out in 2012, but there are some prospective studies that actually show that you have a reduced risk of pulmonary complications by doing preoperative incentives spirometry. Improving pulmonary reserve, strengthening pulmonary muscles, all the stuff that we do routinely postoperatively, we probably, in our higher risk people, should be doing preoperatively as well.

Smoking and cessation, well, it's nice to do that. There's no study-- if fact, there's studies that show that it doesn't really change postoperatively outcomes. But it's a good opportunity a lot of times to get people to stop smoking. And only selectively do chest radiographs for pulmonary function tests.

Frailty, another thing I want to hone in on. This is a definition developed by Fried and colleagues back in the early 2000s. It's been used by a number of other organizations as far as defining frailty. Basically, you're getting weaker and your muscles are shrinking. Defined specifically in this point system that's endorsed by the American College of Surgeons and the American Geriatric Society, if you're frail, you have a high risk of death and a high risk of developing postoperative complications.

This is an interesting little study published in *JAMA Surgery* back about a year ago by a Korean group that looked at 275 patients. And I only bring this up simply just to show you what frailty can do to you. Different types of parameters were looked at. These were all identified by multiple linear regression analysis.

Whether you have malignant disease, how many comorbidities you have, what your albumin level is, once again, predictor. Whether you can do your ADLs or IADLs, IADLs being things like balancing your checkbook, driving, cooking, as opposed to ADLs, which is feeding yourself, going to the bathroom, dressing yourself, and so forth. Whether or not you're demented, your risk of delirium, medical nutrition assessment, and mid-arm circumference, which is kind of a surrogate marker for muscle mass.

And when we look at the outcomes-- whoops. That's not what I wanted to do. We see that the more your score-- the higher your score is, the higher your risk of being dead 12 months later. And those people that were the most frail, had the highest scores of 12 or greater, had almost a 50% mortality rate at one year postoperatively. These were all intermediate or high-risk surgeries they were undergoing.