

## **Episode 4 - Pre-Op Evaluation**

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**Guest:** Kevin Consevage, Division of General Internal Medicine, The Ohio State University

**Sponsor:** The Ohio Chapter of The American College of Physicians

### **Episode Summary:**

Chris Chiu and Kevin Consevage delve into the intricacies of pre-operative assessment, emphasizing its role as a risk mitigation strategy rather than surgical clearance. This episode offers a comprehensive breakdown of assessing surgery types, patient functionality, and the necessary pre-op evaluations and medications.

[00:00:00] Introduction to Everyday Medicine and episode objectives.

[00:00:32] Kevin's introduction and background.

[00:01:06] Discussion on the philosophy behind pre-op assessment.

[00:01:34] Breaking down the steps of pre-op assessment: surgery type, patient's functional ability, and a systems-based approach.

[00:02:05] Detailed analysis on types of surgeries and the importance of assessing surgery urgency.

[00:04:26] Functional assessment in pre-op evaluation, including ASA classification and METs.

[00:07:29] Utilizing the [ACC/AHA algorithm in pre-op assessment](#).

[00:09:37] The role of the Revised Cardiac Risk Index (RCRI) and NSQIP in evaluating surgery risks.

[00:11:38] Considerations for additional cardiac testing and when to involve cardiology.

[00:12:35] Quick hits on necessary pre-op tests: CBC, coags, liver function tests, and PFTs.

[00:14:43] Review of perioperative medication management.

[00:15:49] Closing remarks and key takeaways.

### **Key Takeaways:**

- Preoperative evaluation is a critical risk mitigation strategy that assesses the type and urgency of surgery, patient functionality, and necessary pre-op tests and medications.
- Functional assessment and understanding of the patient's health status through tools like the [ASA classification](#) and METs are vital.
- The [Revised Cardiac Risk Index \(RCRI\)](#) and [NSQIP](#) provide valuable insights into the patient's risk profile for surgery as well as the [Duke Activity Status Index](#).
- Medication management in the perioperative period requires careful consideration, especially regarding the continuation or withholding of certain drugs.

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### **Transcript:**

*Transcript has been edited for clarity*

[00:00:00] **Christopher:** Welcome to Everyday Medicine, a podcast from the Division of General Internal Medicine at The Ohio State University. This podcast is focused on primary care and aims to provide current information to medical professionals from experts in Ohio. We're also graciously sponsored by collaboration with The Ohio Chapter of The American College of Physicians.

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[00:00:18] All right we are back here with Everyday Medicine and I'm Chris Chiu, the Director of Education for our Division. I have Dr. Kevin Consevage, who is a graduating resident and will be joining us very soon as faculty, is that right?

[00:00:41 ] **Kevin:** That's right. In fact, I just graduated today.

[00:00:35] **Christopher:** Congratulations! I have you on today because you recently did a talk on pre-op assessment. Is that right?

[00:00:40] **Kevin:** That is right.

[00:00:41] **Christopher:** And I thought it was great and I really thought it'd be something that'd be great to convey to our listeners. Before we get to that, do you mind giving us a little bit about yourself?

[00:00:50] **Kevin:** Sure, yeah I'm from Harrisburg, Pennsylvania, originally went to medical school at University of Virginia and met my wife there, who, she's a pediatric neurology resident, and then we both we couples matched here to Ohio me at Ohio State and her at Nationwide Children's.

[00:01:06] **Christopher:** We decided to title this talk pre-op Assessment, but it's not pre-op clearance, right?

[00:01:11] We don't... Can you describe that a little bit?

[00:01:13] **Kevin:** Correct, yeah, so a lot of times we'll have referrals for surgical clearance, but what we're really doing is more of a risk assessment and a risk mitigation strategy instead of actually clearing someone for surgery, because even the healthiest person has a risk of a bad outcome going into surgery.

[00:01:34] So what we What I'd really like to do is break it down into a few different steps. One is thinking about the type of surgery and the urgency of the surgery in the context of the patient and their functional ability, and then a systems based approach to make sure we don't miss anything that we could optimize before surgery.

[00:01:54] Another big aspect of it is any testing that needs to be done and ensuring that the medications that we use are or hold are appropriate before and after the procedure.

[00:02:05] **Christopher:** Okay, so let's break this down a little bit. So you said parts of our assessment are the type of surgery that the patient is having, a functional assessment, assistance based assessment, and then just tests, medications, things like that. So let's do this one at a time. So let's talk about surgery. So how do we decide, well, what do we need to know about the surgery and how do we use that in our assessment?

[00:02:25] **Kevin:** Yeah, so there's a lot of different charts that show what the risk of a surgery is. And the risk is usually in the context of MACE or major adverse cardiac events. It's broken down mostly into a binary fashion where 1 percent or higher risk is called elevated risk and a low risk is less than 1%. Those are the procedures like cataracts, endoscopies, breast surgeries that don't necessarily require a lot of pre-op testing and management.

[00:02:55] **Christopher:** Every time I get those pre-op assessments for the cataract surgery they're pretty low risk and I probably shouldn't have to worry too much about those.

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[00:03:01] **Kevin:** That's right. There's sometimes, there's some medications and other things that may pop up but like alpha one blockers for instance, but otherwise as far as a cardiac and risk of mace, that's not something you should worry about.

[00:03:14] **Christopher:** Is there anything else we need to know about the surgeries? Like how urgent it needs to be? How does that factor in?

[00:03:19] **Kevin:** Yeah, in the outpatient setting, I think most of what we're going to see is going to be elective surgeries, and that's a surgery that can be delayed up to a year without any threat to life or limb. But urgent surgeries, those are surgeries that have to take place within 24 hours, and they are mostly seen in the hospital, but you still have time to get some sort of an assessment and optimization done.

[00:03:42] An emergent surgery, on the other hand, is one where you don't have enough time and they should just go to surgery regardless of any pre-op testing or assessment.

[00:03:54] **Christopher:** We talked about the urgency of surgery, looking at the mace associated with the surgeries, and there are tables out there which are pretty easily defined. Is there a table that you like to refer to? Is there one specifically that we can find easily on the internet?

[00:04:05] **Kevin:** I use the one that is on OSU's website.

[00:04:08] **Christopher:** I have a pre-op assessment app that's on my phone that gives me a list of those things and just because I can never remember them, but generally speaking, if it's outside like the eyes or something, all that, once you start going in abdomen, chest, I assume it's much higher risk. So moving on from surgery you said what the next part is like the functional assessment, is that right? What does the functional assessment include?

[00:04:26] **Kevin:** So there's different ways to perform a functional assessment. I think one general way that us internists don't do a lot of is the functional assessment done through the ASA classification. This gives us a general overview, I think, of the patient's baseline health. And the ASA score is correlated with the risk of morbidity and mortality post operatively.

[00:04:49] Most of our patients will probably be in the 2 to 3 range, mild systemic disease or severe systemic disease, but occasionally we'll also have ASA 4s. They've had recent cardiac events or strokes and it helps the anesthesiologist and us just gauge their level of risk for surgery.

[00:05:07] Another way that is more common and familiar to us is hitting that four METS mark. And we usually assess that by asking, Oh, can you walk up a flight of stairs or walk up a flight of stairs? There have been some issues pointed out with this strategy just based on some studies that have shown that our ability to predict functional assessment based on our questioning is actually fairly inaccurate.

[00:05:35] The METS study showed that anesthesiology attendings were only 20 percent sensitive in identifying patients who could complete four METS without symptomatic limitation. However, the ACC guidelines and other even more recent studies continue to support that a self reported ability to perform four METS using one or two flights of stairs does decrease the risk of perioperative cardiovascular complications by about half.

[00:06:04] **Christopher:** So, what about my patients who... maybe they're getting knee surgery and they literally can't walk up a flight of stairs because it is just too painful. Like, are there other ways to assess these four METS?

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[00:06:14] **Kevin:** Yeah, so there's a couple other ways. Another tool that we can use and is also mentioned in the guidelines is the Duke Activity Status Index. Now, this is a 12 question form that patients can fill out on their own and you can obtain a score which correlates with 30 day death in MI.

[00:06:35] However, there is not a strict cutoff with this score that shows, oh, this is a cutoff where it's unsafe to proceed to surgery or not without more testing. The other thing is that some have proposed, and even on mdcalc.com you can find that the Duke Activity Status Index score can be converted to a metabolic equivalence.

[00:06:56] However, there's a lot of variability in those conversions and there are many different calculators out there and some would suggest not doing that and that it's not a safe conversion. Still, if you cannot assess their functional capacity, then it's thinking about, if further testing, for example, a stress test, is going to be something that would be beneficial to the patient? Is it going to change management? If the surgery that they need... you know, is it something that can wait a while? Or is it something that they should probably have done within the next, few weeks to months?

[00:07:29] **Christopher:** We're sorta getting into a part that I'm interested in. Looking at the type of surgery and the functional assessment... We actually use these points in our pathway in the ACC/AHA algorithm for pre-op. Is that correct? Can you walk us through, up until now, everything that we've done in terms of that algorithm?

[00:07:44] **Kevin:** Yeah, so the first step is making sure that it's not an emergency surgery. We've gone through that. Let's just assume also that they're not having an acute coronary syndrome, which is step two. Then you move to step three which is estimating the risk of MACE, and we can do that with the RCRI or the NSQIP which is a tool that surgeons have developed to assess complications and that includes the type of surgery as well. If they're low risk, remember that less than one percent, then you don't need any further testing. If they are elevated risk, meaning one percent or higher, then you have to do that functional capacity assessment with either the, can they perform four METS, and that can be through the subjective evaluation with climbing two flights of stairs, or getting capacity through the Duke Activity Status Index.

[00:08:34] **Christopher:** So we actually blew through a part that I want to go back to talk about. You talked about the NSQIP and the RCRI. What does RCRI stand for and how does it combine some of the things we already talked about? Can you describe that a little more?

[00:08:45] **Kevin:** Yeah, certainly. So the RCRI is the Revised Cardiac Risk Index. This is a validated tool and a very easy tool available on MDCalc that measures the risk of cardiovascular adverse events. The NSQIP is a tool developed by surgeons and although it doesn't have as much validation as the RCRI and it's a little more cumbersome to fill out, but it produces a very nice visual for patients and the surgeon that shows the risk of complications, not just of cardiac, but of many other systems, including things like where the patient is likely to discharge to, either home or to a nursing facility, that sort of thing.

[00:09:22] **Christopher:** But this tool is more cumbersome?

[00:09:24] **Kevin:** Yeah, there's more data points, not only more data points like labs and such, but also I think the most cumbersome part is getting the specific surgical procedure code.

[00:09:32] **Christopher:** I use the RCRI, is that what you generally recommend for us internists?

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[00:09:37] **Kevin:** Yeah, I definitely rely on the RCRI a lot. But, I still use the NSQIP every time and usually paste it into my notes with the chart. But I use the RCRI to guide me through the algorithm.

[00:09:48] **Christopher:** So we've stepped through the algorithm and we looked whether the surgery needs to be urgent or not. We are assessing the functional status and then based on what we are looking at whether it's high risk or not. Where are we now in the ACC/AHA algorithm? What if we're at a point where it's a higher risk surgery based on their RCRI and we have difficulty evaluating their METs. What is the next step now?

[00:10:10] **Kevin:** Yeah, say they they can't, or you don't really know if they can complete four METs of activity then this is the hard part of the cardiovascular assessment, where you have to decide, "Am I going to delay surgery to have this person perform a stress test, or not?" And, there's a lot of factors that can go into that. One is, what's the patient getting the surgery for, and is this something like maybe they're having a tumor removed something that has to happen in the relatively near future that you can't wait for, or is it, a knee surgery that can be pushed out a year and really be annoying but not be life threatening?

[00:10:47] The other thing is... maybe that's a patient who may have underlying coronary disease and you're not sure, and maybe even by the stress test you wouldn't even have to revascularize them, but you could at least get them on appropriate medical management and hopefully reduce risk of cardiac events in a perioperative period that way.

[00:11:05] **Christopher:** If they didn't already have known cardiovascular disease based on this, you're like, oh, the stress testing was abnormal, we should at least get them started on an ACEi or ARB plus a statin, baby aspirin and things like that. Correct, gotcha, gotcha. All right. But it seems like it's still a difficult decision and it has to be pretty individualized for the patient.

[00:11:23] **Kevin:** That's right, yeah.

[00:11:25] **Christopher:** If you're at this point, may you refer to cardiology for further evaluation, whether medical management or revascularization may be needed.

[00:11:32] **Kevin:** Yeah, if the stress test is abnormal, I'm definitely getting a cardiologist's input prior to saying that they can go to surgery.

[00:11:38] **Christopher:** So when I'm doing a pre-op assessment, sometimes I get lots of other questions on what needs to be done. Are there other tests we may need to consider?

[00:11:45] **Kevin:** Yeah, for cardiac testing specifically, you know, you have to think about EKGs and they are often done sometimes a little too frequently, but patients who are undergoing moderate to high risk surgeries of any type or they have a history of cardiovascular disease, it's very reasonable to get an EKG.

[00:12:03] It's also nice to have a baseline as well, so if there are any postoperative ECG changes, at least you have something to go back and compare it to. As far as getting an echo this is really only if you would try, get it otherwise. Like they have dyspnea you don't have an etiology for, or they have a known cardiac issue like heart failure or moderate to severe valve disease that it's been over a year since their last echo.

[00:12:29] **Christopher:** I'm going to do some quick hits on other testing and I want you to tell me, tell me what you think. Do we need a CBC?

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[00:12:35] **Kevin:** No. Not in most patients. Only in patients who have baseline anemia or predisposition to bleeding.

[00:12:44] **Christopher:** Okay. What about coags?

[00:12:46] **Kevin:** COAGS, again, no, but I will say the caveat with the CBC and the coags... again, all surgeons are going to want them, so I think we end up ordering them, but technically in the guidelines you don't need to order them for most patients. If they have chronic kidney disease or are on medications that may impact electrolytes, then it's a good idea to otherwise not need it.

[00:13:08] **Christopher:** What about Liver Function Tests?

[00:13:10] **Kevin:** LFTs are really not needed preoperatively unless it's a patient who has some sort of hepatic disease, in which case that should really pause and think about it.

[00:13:21] **Christopher:** What about PFTs?

[00:13:22] **Kevin:** Pulmonary function tests, you really should only be ordering if you would have gotten that otherwise in a patient who even wasn't going for surgery. There's no strict cutoff for PFT values that would preclude someone from surgery itself.

[00:13:36] **Christopher:** I just want to touch briefly on pulmonary assessment. So is there anything else from a pulmonary assessment that we should be doing, it sounds like PFTs really aren't necessary unless like you would do it otherwise. Is there any other testing or other management we should think about?

[00:13:48] **Kevin:** Yeah, there's a couple things. One quick thing you can do on MDCalc is just calculate the ARISCAT score. And this just gives a risk stratification for different pulmonary complications, including pneumonia or effusions, intubation.

[00:14:00] **Christopher:** How do you spell that score?

[00:14:01] **Kevin:** It's A-R-I-S-C-A-T. And then yeah, sleep apnea is always a big topic in preoperative assessment. Guidelines do suggest screening with a STOP-BANG with a score of three or more considering a sleep study. In practice, I don't think that this is done a lot because usually there isn't enough time to get a sleep study finished.

[00:14:22] However, if there's evidence of a lot of carbon dioxide retention on their laboratory work or something of that nature, that would be something that you would want to delay surgery and get that sleep study first.

[00:14:32] **Christopher:** Now, otherwise, would you put that in your assessment?

[00:14:34] **Kevin:** Yeah. Put that in the assessment and the anesthesiologist will be aware to use CPAP a little more liberally before and after intubation, sparing opioids, that sort of thing.

[00:14:43] **Christopher:** You said that the other part of perioperative assessment and management is talking about medications. So I want to go through, I have a list of them, I want you to let me know what your thoughts are. Beta blockers?

[00:14:54] **Kevin:** Continue.

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[00:14:54] **Christopher:** Calcium channel

[00:14:55] **Kevin:** Continue.

[00:14:56] **Christopher:** ACE or ARB?

[00:14:57] **Kevin:** Controversial, but still probably hold or anesthesiology might cancel your case.

[00:15:02] **Christopher:** Oh, really? Okay. Diuretics?

[00:15:05] **Kevin:** Usually hold.

[00:15:06] **Christopher:** Aspirin?

[00:15:07] **Kevin:** Continue, unless neurologic surgery.

[00:15:11] **Christopher:** Plavix?

[00:15:11] **Kevin:** You should be holding that for five days prior.

[00:15:14] **Christopher:** Okay, so aspirin okay, but you can stop the plavix. What if they're only on one, one antiplatelet?

[00:15:19] **Kevin:** And they need to be? I would discuss it with the cardiologist and the surgeon.

[00:15:22] **Christopher:** Excellent. What about Statin?

[00:15:24] **Kevin:** Continue.

[00:15:25] **Christopher:** Metformin.

[00:15:26] **Kevin:** You should hold for 24 hours.

[00:15:28] **Christopher:** Insulin.

[00:15:29] **Kevin:** You can cut that in about half the night prior if it's basal insulin.

[00:15:32] **Christopher:** Any other meds that I'm missing?

[00:15:34] **Kevin:** SGLT-2 Inhibitors usually held a few days before due to the risk of DKA being in NPO status.

[00:15:40] **Christopher:** Excellent. I think we hit pretty much everything and a lot of these are discussed in more detail in the ACC/AHA guidelines. Is there anything else you want our listeners to know about?

[00:15:49] **Kevin:** Obviously this was a brief review, but there's a lot of different details in many different systems, be it rheumatologic or endocrine, geriatric patients to consider.

[00:15:57] **Christopher:** Thanks again, Kevin, for coming on and talking to us about perioperative evaluation and management. And for the rest of you listeners, thank you again for listening to another

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