



American Society of
Anesthesiologists™

Central Line

Episode Number: 72

Episode Title: Inside the Monitor – Perioperative Infection Control

Recorded: June 2022

(SOUNDBITE OF MUSIC)

VOICE OVER:

Welcome to ASA's Central Line, the official podcast series of the American Society of Anesthesiologists, edited by Dr. Adam Striker.

DR. ADAM STRIKER:

Welcome back. I'm Dr. Adam Striker, editor and host of Central Line. Today, we're going to discuss infection control in the perioperative period, a topic the August ASA Monitor also grapples with. My guest for this show, Dr. Kumar Bilani, professor of anesthesiology and adjunct professor of medicine and pediatrics at the University of Minnesota. Dr. Belani, welcome to the show.

DR. KUMAR BELANI:

Thank you, Dr. Striker.

DR. STRIKER:

Well, before we get into the details, why don't you tell us a little bit about yourself and how your interest developed in infection control?

DR. BELANI:

So, I've been in anesthesiology for at least 45 years and I've seen a lot of changes take place. But my, my reason for being interested in this topic of infection control starts because my wife is an infectious disease expert. And because of that, I was able to connect with a lot of people dealing with patients with infections. And I became particularly interested when we had the first case of HIV in the state of Minnesota and then got to know all the people. And, you know, it was chaos at that time in the operating room. But I learned a lot about that disease. And then eventually it was able to connect to a few people to do a large study in India because of our connections

there. And we were able to show that generic drugs are as effective and very cost effective, and I was able to arrange that study for the infectious disease experts.

And since then, I have been in close contact with infection control and infections, and I do hold a joint appointment in the infectious disease section in the Department of Medicine. So that's how I developed an interest in this.

DR. STRIKER:

Well, we know infection prevention and control are critical elements of perioperative quality and safety, in part because health care associated infection is the leading cause of postoperative complications in hospital readmissions. So given that, what role do perioperative teams, what role do anesthesiologists as part of that perioperative team, play in the in the prevention of infections and reducing post-operative infections?

DR. BELANI:

Yeah. So the thing is, in the beginning we really didn't focus a whole lot other than what the hospital did for the operating room. You know, when patients come to the hospital. One of the reasons is because the operating room is a quote unquote sterile environment. But then as things progressed, we realized that the cost of treating infections after surgery was quite extensive. And the ranges, it ranges anywhere from 10,000, \$11,000 all the way up to 26, \$27,000. And those costs initially were being paid, but then eventually they became a penalty. And once once a hospital had an infection, then the insurance companies would not pay for that. It would be treated like a penalty. So hospitals started to pay more attention to this, and it became important for teamwork to try to figure out how to reduce these infections. It's the, you know a patient comes for surgery, he or she doesn't want to have an infection afterwards. So so the process begins with the patient who comes to the clinic and then the hospital that plays a major role in making sure that there is a sepsis. And then the interaction between physicians, health care providers, health care workers in the entire perioperative team are going to be responsible to make sure that they have an understanding of perioperative sepsis, especially wounds and and how to protect and prevent that from happening. So teamwork was very important. And that's how this process has become currently really relevant. And it's it's it plays a major role during the perioperative care of patients when they come for either ambulatory surgical care or inpatient hospital care in the larger hospitals.

DR. STRIKER:

Well, it's obvious that anesthesiologists are integral into preventing infection in the perioperative phase. But how do we partner with the rest of the team? You mentioned teamwork throughout the entire hospital or surgical experience or what have you. How do anesthesiologists fit into that partnership, if you will?

DR. BELANI:

Yeah. So we begin with the pre anesthesia clinics that are now reasonably routine in major places and even in ambulatory. clinics. You know, the the thing is the patients are educated and they're alerted about what their role is in preventing infections. We find out as much as possible as we can about the patient to see if they have any immunity related problems. They are alerted about how they should prepare themselves for surgery in terms of washing, having a bath before they come to the operating room. The next day they are sent, they're given solutions, a chlorhexidine that they can wipe the areas and especially if it's going to be a spine or a joint problem, then they do a head to toe wipe of the whole body so that when they come to the operating room, they are quite clean and and the wounds are going to be there won't be much disruption of bacteria from the skin. And then we try to figure out which patients will need nasal decolonization with ointments like rosin because because that will help take care of *Staphylococcus aureus*, which is a common bug that infects surgical wounds.

So it begins in the pre anesthesia clinic and then of course when, when the patients come to the preoperative preparation area where they are received, then we follow certain things as a team to make sure that that the they stay warm before they go to the operating room. And for this they are given a special blank robe that they put on. It's a paper disposable robe that can be hooked up to a heating device and they are warmed there, the skin is prepared, and then they go to the operating room and we do everything we can to keep them warm so that these wounds will be will not get infected. Because when you're a normal thermic, then the risk of decreasing the immune response is going to be less. So it starts from there.

And then then the other things are the sterility that we observe in the operating room, making sure that the surgical instruments are perfectly sterilized. They have special systems to make sure that, for instance, using hard metal boxes to keep the instruments are better than having a blue drapes on top of them because you get, you ensure that there's proper sterility in those instruments that surgeons are going to use. And then, of course, proper hand-washing, wearing surgical drapes and surgical gowns, doing surgery masks and exerting precautions, like when you when you have a clean area in the anesthesia place near the anesthesia machine and then the delivery, recognizing all that is, is crucial.

So this is how we work as a team. And there are special nursing groups that will monitor these things. And then if they see any break in the system, they will alert people. And then periodically the hospital does quality assessments to make sure that we are staying on track. Our perioperative director, who is an anesthesiologist, meets weekly with the entire perioperative leadership team, and they review data to make sure that we don't have a spike in infections and or there's a breakdown in the sterilization process. Similarly, we want to make sure that there's no excessive flashing of instruments occurring during the week before. So those are things that are responsible for teamwork to do so that the surgical site infection rate can be diminished.

DR. STRIKER:

You mentioned a number of detailed ways in which all of us can prevent infections in the perioperative environment. But specifically related to anesthesiologists, do you mind going to a little more detail? What can the anesthesiologists, the person actually providing the anesthesia in the room, what are things you think we should all be doing when we're actually delivering the care?

DR. BELANI:

So you have the things that we do reasonably routinely is, like I said, first, when the patient comes to the pre-op, we make sure that they are stable. Will they stay warm?

And then the second thing is the preoperative administration of anti antibiotics in a timely fashion. We want to make sure that those antibiotics get in into the bloodstream before the surgical incision is made. And this is done as part of the time out process. So at our place, we typically have these antibiotics order in the pre-op node so that they are ready to go. And then as soon as the IV started, we begin those antibiotics. Some of them, like vancomycin, will require extra time because they are infused slowly. And then before we start, so there's a time out process, to make sure that the antibiotics are in. And the surgeon knows that before he or she makes the incision, that they have adequate blood level at the tissue site so that these infections do not occur.

The third thing we do is we ensure normal thermal during surgery and we make every effort possible to prevent that drift with redistribution of heat that occurs with anesthesia induction. And that's why pre warming of the peripheral tissues is important because because it has been shown that with anesthesia induction, if you keep the peripheral tissues warmer than the drift, that redistribution is less. And the best way to do that is to warm them pre operatively. And the second thing is to maintain normothermia by ensuring that the exposed and non exposed areas are kept warm with be used to stay in place. So this is a second thing that we do. The third thing is we try to maintain

normal glycemia as much as possible, keep the blood glucose less than 200 if possible, and that that ensures that the bacteria do not have a hypoglycemic environment that they can enjoy if the patients are not kept normal glyceemic.

And then lastly, we have to make sure that the tissues are well perfused, well oxygenated. So we try to minimize things that will interfere with blood supply to the areas that are being surgically operated upon. And so we maintain a little higher inspired oxygen fraction to make sure that there is adequate oxygen delivery to the sites where the surgery is occurring.

So these are some of the things that we can do for the patient. And besides the common hygienic things that that are now routinely practiced, for instance, when we do what's called scrub the hub, that means that when we inject anything through the I.V injecting sites, we make sure that they are wiped with alcohol before they are injected. We wear we wear gloves so that there is less contamination. We try not to use multi-dose vials in the operating room so that we prevent cross-contamination. And then needles, we have to be very careful that we have a special way to not re use those needles, but dispose them off properly and then keeping clean areas clean, not taking dirty hands and putting them in areas in our back table to contaminate what's over there. And, you know, luxurious use of hand cleaning alcohol that's available next to our anesthesia machines. So these are things that previously were not emphasized but now are kind of routine and rub the hub is become standard practice in the in the operating room.

DR. STRIKER:

You know, I've heard varying opinions from infectious disease experts, depending on where the assessment is in the organization, whether it's in preparation for Joint Commission visits, whether it's related to COVID pandemic and whatnot. Hand hygiene has been certainly emphasized largely in many institutions. When we talk about the practicality of hand hygiene and how many times we're gloving and degloving and how many times we have to scrub before and after gloving and degloving and been told that, well, if you're within the patient zone, it's okay, you don't need to do hand hygiene every time. How vigilant do you need to be for preventing infection versus being practical and taking care of a multitude of factors with with the patient?

DR. BELANI:

You know, the good thing is that most of the things we do becomes second nature. So we routinely, as soon as the patient comes in, that's on the operating table, it's not uncommon for us to put on our gloves. And then when we when we book the IV sets or

the IV injecting site, we always wipe it with alcohol before we inject anything. We've drawn up our drugs and we've kept them aside. We have a place where we keep the drugs that we're going to be using, and those drugs are going to be only for that patient. So once we have our gloves on and we use only those drugs, then those gloves don't need to be changed. And then the machine itself is wiped and cleaned before we start so that so that those gloved hands will touch the machine, we will touch the knobs, but it's for that particular patient. So then it doesn't matter. If we for some reason have to go into a drawer and take out something new, then we will take off our gloves and take out the new item that we want to remove, put on our gloves again, and do that so it becomes second nature and it doesn't deviate from anesthetic care for the patient while we're watching the vital signs, making sure that the anesthetic depth to pain control hemodynamics are all in working order.

And then we we have those protocols where we have timeouts to make sure that the antibiotics are given on time and then anything special or issues related to the patient are discussed at that time. So the good thing is this has now become routine. And the only thing that really makes a difference nowadays is the is is our iPhone that we are handling all the time. And and I think that's one thing that we still have to figure out. How are we going to keep ourselves from contaminating the iPhone? The good thing is that it can be very easily sterilized by using ultraviolet light, and it takes 30 seconds to do that. But as a routine, what I personally do is that I wipe my phone before I start the particular case and then I make sure that I wipe it again when I'm leaving the room. So we use those chlorine containing wipes that will that will clean the iPhones. And the same thing goes with stethoscopes. They also come in contact with the patients and we wipe those also.

DR. STRIKER:

Well, that brings me to my next question, which was how are anesthesia residents being educated?

DR. BELANI:

Yeah. So we have an orientation period where they spend three months of dedicated time into learning the hospital protocols and then we spend a good amount of time on infection control during this orientation process. So actually, this is the best time for the residents because they really don't have any individual responsibility, but they have to pay attention to detail. So they do get a talk about this infection control and the issues in the hospital. We have QI projects. We we discuss during our MNM conferences the number of patients that did not meet the normal thermic criteria. So they are alerted to that fact. There will be grand rounds that are given and sometimes the residents will

take up this topic themselves and they will present this. And then there is monitoring by nursing teams, different rooms where if somebody is not following protocol or breaking the protocol, then they're individually educated about this and there's no penalty or anything but they are told that this is what they should do. And then personal health measures to protect infection for not only for themselves, but for the patients. And we encourage them to also wear, in addition to face masks, eye protection, so that they stay protected with the PPE that they sometimes have to wear. So this is a routine for training. And they get education. They get QI projects. Grand rounds. And and sometimes we will have lectures on the incidence of surgical site infections from a particular group of operations, surgical procedures. So that's how we keep keep them educated and up to date.

DR. STRIKER:

Great. Well, there's a few other issues I want to tackle, but before we do that, let's take a short patient safety break. Please stay with me.

DR. JONATHAN COHN:

Hi, this is Dr. Jonathan Cohn with the ASA Patient Safety Editorial Board. Mitigated speech and incivility can both have negative consequences on team performance. In times of urgency, health care professionals should voice their concern at least twice to ensure it's been heard using an increasing level of respectful assertiveness. One tool for using graded assertiveness is to use cuss words.

First, state your concern if the message is not received, explain why you are uncomfortable with the situation. Finally, announce that there is a safety issue. Other acronyms for graded assertiveness exist, but whatever method you choose should be universally used at your institution so that the team gets accustomed to the signal words and understands their use indicates that there is a serious safety concern that must be addressed. Being as direct as possible while remaining respectful, is the key to successfully communicating a threat to patient safety.

VOICE OVER:

For more information on patient safety visit asahq.org/patientsafety22.

DR. STRIKER:

Do you feel that the anesthesia residents overall other than your institution, is this something around the country anesthesia residents around the country are being trained in adequately

DR. BELANI:

I'm not exactly sure if that's done nationally, but I know that this is something that's being emphasized. I know that globally it's the practice of preventing surgical site infections is hot on the list for most people. And I think there will be questions in there board exams. So they will mthey will have to prepare for it. And and they will they will need to learn these things. And more and more topics addressing this issue are showing up in journals. So I think nationally it is high on the list. I'm not exactly sure whether every program has dedicated training like we do at our place.

DR. STRIKER:

Let's talk a little bit about facilities role in all this. What can facilities do to help with this process and what are things that you might suggest others could suggest to their facilities that could could aid in infection prevention?

DR. BELANI:

Good. So the thing is, the, having COVID show up in 2020, early 2020 was a good eye opener for most facilities. So so what's happening now is facilities are making sure that they ensure that the operating rooms are cleaned every day. And between cases they have protocols they follow. And then the other thing is they are doing ATP counts to show how much microbes there are in the rooms. And if they exceed a certain amount, then those rooms will have to be prepared and cleaned. Same thing for for the physician and health care worker lounges. So are closely monitored, cleaned and protected from some infections. The there are teams that have been actually doing for a long time and this is now being further reinforced. All the equipment that's used, the instruments, they are checked regularly on a daily basis to make sure that that there's no nothing that's not cleaned and washed with soap and water. And then they are kept in the instrument trays and then they have sterilized the sterilization checks that take place. There will be people that will have will monitor people getting in and out of the operating rooms, make sure that they have the hats on, they have the masks on, and they're wearing gloves. So the hospital is on high alert because of COVID and they're doing the best they can and keeping patients that have viral infections like COVID and other viral infections in specialized areas in the hospital with negative pressure rooms to prevent other people getting infected, having adequate PPE available, and then limiting the number of people

showing up in the hospital because they could be sources of infection. And so those are the things that the hospitals are doing and making sure that this is followed.

DR. STRIKER:

In your opinion, do you think hospitals reprocess enough versus using disposable equipment? I know a lot of individuals share concern with the amount of waste we use in the operating room, and a lot of that waste is centered around prevention of infection. A lot of individuals feel that that perhaps is too much, that we've gone too far, and that there's a lot of reprocessing or reusing equipment, if you will, that could accomplish the same end goal of infection prevention without generating all the waste. And you may not know the answer. I just wanted to know if you've thought about this or if you had any thoughts about that in general.

DR. BELANI:

Yeah. The thing is, it was a good idea when it first came about that using disposable items would actually decrease the rate of infections occurring in patients. But that's not turned out to be true. What's happening actually is there's more waste like you, like you mentioned. So I think the bottom line is that whatever comes in contact with the patients that we're using should be sterile. And the fact that it's disposable will actually ensure that it's sterile is true. But that doesn't mean that that's going to decrease surgical site infections, because the process of every hospital has processes in place, which takes care of the fact that everything that's going to be used is again, coming in sterile. But but they have to have great contracts with outside providers that do this for the hospital or if they have an in-house facility, there has to be close monitoring and this will actually decrease the waste and also help achieve the purpose of preventing surgical site infections.

As far as anesthesia goes, using disposable laryngoscope has not been shown to decrease surgical site infection. And so that hasn't really been successful. Sterilizing the drapes that we use is not a bad idea. I know that in the United States we use disposable drapes, but there are hospitals globally that are using non disposable drapes that are sterilized in-house and can be reused. I think the bottom line is that whatever you do, make sure that the process is accurate and closely monitored and there's no reason to use disposable if you can do without it, because of the waste it creates. But certain things have to be disposable. And those, I think hospitals will continue to use.

DR. STRIKER:

We mentioned COVID earlier. Because it's such a big topic, it's obviously affected how all of us practice over the last couple of years. Some strains of COVID, such as Omicron BA2, are going to increase the likelihood that we see infected patients for surgery. There's more patients that are going to be infected that need surgery rather than this specific variant causing patients to need surgery. What have we learned about interventions and best practices for mitigating COVID transmission and for controlling infections?

DR. BELANI:

Well, the first thing that we learned is that we shouldn't take for granted that patients coming in, those that may be tested for COVID. I mean, we do test everybody for COVID these days, but even if they're not tested, we should assume that every patient is potentially going to be an infected patient. So we've got to treat them using universal precautions. So if they do have COVID then obviously we need to try to keep them in negative pressure rooms as much as possible and then alert people so that they can protect themselves by using proper PPE.

And the thing is that that this is going to be an issue for for quite some time. And we will be seeing more and more patients who are going to be COVID positive with the newest strains. And some of them will have no symptoms and many of them will be stable. And we just have to make sure that we prevent transmission of infection from the patient that shows up to the hospital to other other individuals in the hospital, whether they be it, whether they are patients, other patients, or the health care providers that are taking care of them. So we need to protect ourselves and we need to give the required care to those patients. But making sure that the disease is not spreading to other people.

DR. STRIKER:

Well, let's talk about fomites. Inanimate objects such as clothes or bedding, things like that, can harbor pathogens. Fomites do not transmit COVID, but what can they transmit? What do we need to know about them?

DR. BELANI:

Yeah, most of the the luckily the fomites don't transmit these viral infections, but they do transmit bacterial infections. And those bacterial infections can be laying on inanimate objects. And so we have to make sure that that's why we put on our gloves. That's why we we try to minimize using unclean equipment that we might carry on ourselves, like stethoscopes and cell phones that are already mentioned. Anything that we that we're

going to be bringing in contact with the patient, we have to make sure that that's cleaned and wiped and follows the institutional protocol.

So there is a role for fomites, for bacterial infections. And that's why we we we have to wear sometimes PPE when patients come in with MRSA infections. I did a recent quick evaluation of how many people were actually wearing these gowns and gloves and masks. When we have patients coming in with known MRSA infections or even the bacterial infections in the gut. But the biggest offenders of of not wearing these gowns and gloves were actually physicians. Nurses were doing a good job of wearing these gowns and gloves, but not the physicians. So I think that's another place where we need to emphasize that, that this is an important issue and that protocols have to be followed. Other forms, I think we've got to wipe them or we've got to sterilize them with ultraviolet light as possible. Takes only 30 seconds, but just as simple cleaning before we reuse them all day is a good idea.

DR. STRIKER:

Well, I'm looking forward to this issue of the Monitor and wondering if you've learned anything that we haven't touched on today.

DR. BELANI:

Yeah, I think I think this issue will highlight what are the most important things that we need to know about surgical site infections. We need to address some of the things related to oxygen delivery, for instance. I mean, how long do we keep them on high inspire oxygen fractions postoperatively? That that question still needs to be answered. But otherwise, I think doing things in a timely fashion, making sure that the antibiotics are given before the surgical incision starts, and showing normal thermia, making sure that patients are not hypoglycemic. Some of the simple things we can follow hygiene, personal hygiene, patient hygiene. Those are important things to prevent surgical site infection. And the patient's role in coming there and making sure that the skin has been wiped. And these days, you know, they don't use surgical blades to shave. They use clippers so that they don't interfere with the normal microbiome on the skin, things like that. So there's still a few things we can learn and this will highlight the important things and create hopefully more interest in everybody in treating this problem which which can be expensive to treat and can penalize facilities. Thank you.

DR. STRIKER:

Yeah. Our pleasure. Before we leave. Any further advice or take home points that you want to leave our audience with?

DR. BELANI:

I think, I think they everybody who is taking care of patients in the perioperative period needs to realize the value of teamwork. Put surgical site infection as one of the things on the top of the list when taking care of patients and minimizing this occurrence is going to be something that everybody will be happy, including the patient. I mean, if I was to go as a patient, the last thing I would want is a surgical site infection. Myself, I've seen patients who have developed surgical site infection and they've been coming back to us many, many times to completely get healed up. It's it's a big problem in those patients. So it's best is is to prevent this issue than to treat it. So I think prevention is better than cure.

DR. STRIKER:

Well, Dr. Belani, thank you for joining us and sharing your expertise with us. It's been a pleasure talking with you.

DR. BELANI:

Thank you, Dr. Striker. It was fun talking to you and and reconnecting with you after so long.

DR. STRIKER:

You, too. And to our audience, thanks for joining us. If you want to learn more about infection control and the perioperative period, you can do so at asamonitor.org. In the meantime, give us a review, a follow. Tell a friend about it. We really appreciate it. See you guys next time. Take care.

(SOUNDBIT OF MUSIC)

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