

Antibiotic Crisis - The Role of Antibiotic Stewardship

Guest: Patrick Welch, PharmD, BCACP

Dr. Patrick Welch is an advanced clinical pharmacist that practices in family medicine with Intermountain Health in Utah. He graduated from the University of Utah college of Pharmacy before completing a two-year residency. Dr. Welch manages chronic disease states like diabetes, utilizing advanced technologies such as continuous glucose monitors and insulin pumps. As a board-certified ambulatory care pharmacist, he is deeply committed to providing patients and healthcare teams with evidence-based tools and resources that align with both clinical guidelines and best practices in antimicrobial stewardship.

Host: Candace Pierce DNP, MSN, RN, CNE

Dr. Pierce is a nurse leader committed to ensuring nurses are well prepared and offered abundant opportunities and resources to enhance their skills acquisition and confidence at the bedside. With 15 years in nursing, she has worked at the bedside, in management, and in nursing education. She has demonstrated expertise and scholarship in innovation and design thinking in healthcare and education, and collaborative efforts within and outside of healthcare. Scholarship endeavors include funded grants, publications, and presentations. As a leader, Dr. Pierce strives to empower others to create and deploy ideas and embrace their professional roles as leaders, change agents, and problem solvers. In her position as the Sr. Course Development Manager for Elite, she works as a project engineer with subject matter experts to develop evidence-based best practices in continuing education for nurses and other healthcare professionals.

Episode 1: Antibiotic Crisis - The Role of Antibiotic Stewardship

Transcript

Candace Pierce: Hello listeners, welcome to our podcast series, The Antibiotic Crisis, The Role of Antibiotic Stewardship. This is Dr. Candace Pierce with Elite Learning by Calibri Healthcare, and you are listening to our Elite Learning Podcast where we share the most up-to-date education for healthcare professionals. Now in this series, we're going to look at the critical issue of antibiotic resistance and the pivotal role that healthcare providers play in combating this global health crisis. Joining me for this series

is Dr. Patrick Welch, an advanced clinical pharmacist. Patrick, thank you so much. It's so great to have you back.

Patrick Welch: Thanks for letting me jump back on.

PIERCE: Absolutely. So, before we really get into the what of the matter, I wanted to talk about the why. So, a few years ago, we heard a lot about antibiotic resistance. We heard it on the news, in the news, but I've really noticed over the last few years, we don't really hear as much about it. And I do have some statistics that I want to share here in just a minute, but I was curious, what are your thoughts on the drop in awareness pushes?

WELCH: Yeah, hopefully the reason we're not hearing about it as much is because there's a lot more education that's been given not only to healthcare professionals, but to the public and our patients. So, like you mentioned, there was a big push out in my area where I practice in Utah. We had a lot of media coverage on antibiotic resistance. I am a little concerned that maybe the pandemic that we've gone through has kind of pushed a lot of that concern for antibiotic resistance and coverage on that down a little bit. Everybody was a lot more focused on the pandemic and on COVID. So that's a potential concern, but really overall, I think the efforts that we've made in the United States as a healthcare system have really shown some benefits and some outcomes where even now I'm not getting patients to come every day thinking, hey, my nose is running, so I need an antibiotic.

PIERCE: Let me have that antibiotic.

WELCH: Yes, exactly. Right. Like that's the cure all. I'll feel great tomorrow if you give that to me. So, I think a lot of it is education that has been given not only to clinicians and providers, but also just to the general public. And, and definitely as healthcare providers, we're kind of front lines, they're providing that education to patients. And, you know, there's some patients that leave a little upset because they came in wanting something and didn't get it. But again, as we continue to educate patients, hopefully we're going to see less and less of this concern popping up.

PIERCE: Now I do have some statistics that really point out why this is still a critical issue. It's well documented that antibiotic resistance is a growing threat to millions of people worldwide. So, I want to start with the global statistics. The World Health Organization, it estimates deaths of 700,000 globally and they say that antibiotic resistance is responsible for these deaths, and if no action is taken, this number could actually rise to about 10 million deaths annually by 2050. And then there's the economic impact, which is equally staggering. There's estimates suggesting that antibiotic resistance could cost the global economy up to \$100 trillion by 2050. And then if you move into the U.S., we talk about healthcare associated infections. Those affect about one in 31 hospital patients on any given day, and actually many of those are linked back to antibiotic resistant bacteria. And shockingly, this was shocking for me. Fifty percent of all antibiotics prescribed in hospitals are either not needed or not optimally effective as prescribed.

WELCH: And again, we'll talk a little bit, think, as this conversation progresses about the outpatient side as well. But yeah, inpatient, it's staggering to see the amount of antibiotics that are prescribed that, again, maybe the majority of them are not necessary. But it's a huge burden. You talked about the potential just from a cost standpoint. And as we look at antibiotic stewardship and programs to help improve how we're prescribing and using antibiotics, money speaks, right? And so as we talk to, you

know, leaders within our organizations or at local and state levels, using that cost is what can speak on and hopefully get the ball rolling for different programs.

PIERCE: Now I do have some positive statistics that really are going to hit on what we're talking about today. But studies have shown that patient education by healthcare providers, including nurses, can reduce inappropriate antibiotic use by up to 20%. And hospitals that have really taken time to truly implement an antibiotic stewardship program have seen a 19% reduction in antibiotic use, and a 33% reduction in C. diff infections, just as an example, because if you're a nurse, or if you are an inpatient, you know that smell. You can identify that when you walk down the hallway. So I think that's just more reasons why we should continue this discussion on antibiotic resistance, because it really is a critical issue.

WELCH: Yeah, absolutely. And I want to share a study that was actually done out here funded by the CDC, but it was done with the University of Utah and Intermountain Health. And it was just published last year, but they were focused on outpatient and urgent care, prescribing of antibiotics. Because again, we talk about hospital visits and a lot of antibiotic use there, but urgent care is a big user of antibiotics as well. And their interventions were, as you mentioned, education, not only for patients, but for clinicians, they did put in some electronic health tools to help kind of direct clinicians towards prescribing, but they also shared benchmarking data from clinician to clinician, clinic to clinic, that was kind of allowing those clinicians to benchmark themselves against their peers and see, hey, am I overprescribing? Am I underprescribing? And that led to quite some outcomes. So, if they looked at their respiratory conditions, people that came in for respiratory conditions, and they found almost a 15% decrease in antibiotic prescribing. And then they looked also at acute bronchitis and just common cold. And about 20% of those patients were receiving antibiotics on that urgent care visit. And after the study, it knocked it down to 7.5%. So again, I think a lot of that was just the education for patients and clinicians and definitely helped reduce by a substantial amount the antibiotics that were being prescribed for unnecessary conditions.

PIERCE: Maybe it made them more aware of what they were doing, that antibiotics were not the easy answer. And in the end, it's really not an easy answer when we have to then deal with the effects of antibiotics not being used appropriately. So, I want to move us back to the what. And so, I have a two-fold question for you. Can you define antibiotic resistance and antibiotic stewardship and why stewardship is important in healthcare?

WELCH: Yeah, let's talk about the stewardship part first. Just the word stewardship, right? That means taking care of something in our possession or that we're over. So antibiotic stewardship is just making sure that we are using antibiotics appropriately and effectively when necessary. Again, you just mentioned it's not an easy answer. A lot of people still assume, hey, I can just go in, get an antibiotic, give me that Z-Pak, right? That's I think a common one.

PIERCE: It's always popular.

WELCH: And we're going to be just fine. So that stewardship is making sure the antibiotics that we have, we're using those when needed and we're using them appropriately, whether it's the correct antibiotic for the bacteria, the duration is correct and things like that. Antibiotic resistance is something that we see develop, we expect it to develop just like we've seen with the COVID virus, that evolves over time, right? Bacteria is the same way, they're evolving over time. So, the more exposure the bacteria have to

antibiotics, they're going to develop mechanisms to, in the bacteria's case, become resistant to that antibiotic. So over time, as bacteria have more exposure to those antibiotics, they're going to eventually evolve. And that's where the stewardship portion comes in. Again, if we have the right antibiotic for a bacteria that we're treating, that antibiotic should be able to treat the bacteria and kill the bacteria. If we're using an antibiotic, and there's not bacteria there, if it's a virus, we still have bacteria everywhere. And so, those bacteria are going to start evolving. Bacteria has many different mechanisms that it uses to become resistant, whether it's the membrane or the cell wall that's evolving, some develop little basic little pumps that just kick that antibiotic out. And so it does not having an impact on the DNA or the ribosomes. There's also enzymes that are developed that attack antibiotics. And so not only are there defense mechanisms that bacteria have, but also kind of going on that offense and attacking the antibiotics. And so again, that stewardship is making sure the correct antibiotic making sure we're educating our patients to take it correctly. We've got antibiotics, penicillins are a good example of they require time, a certain amount of time at a level to really destroy that bacteria. And so if our patients take a dose and miss the second dose, that level drops, the bacteria still has a little bit of exposure, but it's not enough to kill it. So then that resistance begins to develop. So the stewardship programs, they can vary from institution to institution, but they're really intended to help with that education as well as making sure from the healthcare provider side that we are matching the correct medication and duration to the actual bacteria that we're treating.

PIERCE: So in my mind, when I try to explain antibiotic resistance to a patient, simplifying what it is that I'm trying to tell them. And so in my mind, when I'm listening to you talk, what I see is we cannot develop antibiotics as fast as the bacteria can evolve.

WELCH: Yeah, absolutely. And I actually have some statistics here from the World Health Organization. So, between 1935 and 2003, there were 14 new classes of antibiotics that were introduced. Since then, there's only been about a handful, a couple handfuls, of 10 new antibiotics approved, but only a couple with new classes of mechanism to attack that. So, we've had antibiotics now since the discovery of penicillin, but we haven't really had a whole lot of new novel mechanisms over that time. So that bacteria, they're consistently evolving, but our medication use, new medication options are not evolving as quickly. Some of that's due to just lack of financial incentive for companies to develop that, but definitely a hard thing with that is making them understand, hey, we've had these antibiotics that treat diseases for decades that bacteria is evolving and these antibiotics have not necessarily evolved or haven't come up with new ones to help combat those new changes to that bacteria.

PIERCE: So what are the key principles that you would say are a part of antibiotic stewardship?

WELCH: Yeah, there's a few. The CDC has actually had a few, I'll go through those, but the first one I like to think of often referred to as the 5Ds. So, it comes with drugs, making sure we've got the right drug, the correct dose, the right drug route. So, IV or oral are correct duration, right? Are we treating for five days, seven days, 10 days, and then timely deescalation. Again, as we talk about a hospital incidence, making sure that if we're treating patients come in, they're sick, we think there's an infection, we give them a wide spectrum antibiotic, making sure once we get cultures back, or once we understand what we're treating, we deescalate that therapy and give them a smaller therapy antibiotic to really target that one specific bacteria. Again, thinking of right drug, right dose, the duration, those things, when it comes to the actual program itself, a stewardship program. Again, a lot of this can vary from institution to institution, but the CDC has some really good recommendations on what they encourage institutions to have. And this is for any setting. It doesn't matter if we're in a long-term care center, in the emergency department, inpatient, outpatient, urgent care. It kind of correlates to everything. So there needs to be

some accountability. Whether it's one person, usually it's better if it's a committee or a group of people that are overseeing this and have that accountability where they're going through all the data, the processes and things like that. One thing that we've, as a pharmacist and pharmacy profession, we've been very excited about is the CDC highly encourages having some pharmacy expertise on that team, right, to make sure we're using those antibiotics correctly and make sure there's a pharmacist that's intimately involved in that antibiotic stewardship program. And then it comes down to action, making sure again, as frontline clinicians that we're implementing, whatever the program is, tracking is also a big thing of these programs, making sure we can gather that data, not just for data gathering, but that helps us learn, right? I mentioned that study earlier where they were benchmarking peer to peer. And just making sure we can take a step back and review, all right, how are we doing in this area? How are we doing on this unit? How is each clinician doing specifically? And that tracking and reporting then takes us to the education piece where, again, we can give more targeted education if we need to, to a specific unit or a specific clinician. Or maybe it's our patients we're seeing with poor compliance who are always coming in asking for antibiotics. That all drives down to that education piece where we see that impact coming from these antibiotic stewardship programs.

PIERCE: Can you give a little background on, we have these standardized dosing for antibiotics, what's the history of that? You know, this is how much you weigh, this is how many days, and this is the dose you're going to take it at. Where did we really come up with those?

WELCH: Yeah, that's a great question. probably seen, people have probably seen over the last, even the last decade, where there's been a big shift in duration specifically of antibiotics, right? And so initially how we're dosing those, again, just like with any medication, a lot of it comes down to labeling from the FDA. How were those medications studied and how are they approved? And as they came out, I think the general consensus was, we want to make sure we're treating this and curing this infection. So, let's treat for 14 days, because more has got to be better. And, as our knowledge has evolved, as we've seen in practice and really started to take a look again and run through other trials, create new studies, it's shown that duration, we can shorten. UTI is a great example. I think when I first started, it was seven to 14 days is what most UTIs were, most patients with UTIs were given for a prescription antibiotic. Now three to five, maybe seven days is what we're seeing. And so again, that continued step back and reviewing of data that we're tracking isn't necessary to continue that antibiotic or is it just, you know, exposing other bacteria to that antibiotic leading to other bacteria developing that. So again, initially thought was more is better and as education's evolved and our understandings evolved, you can see, hey, if we're treating the right bacteria with the right drug, that duration might not need to be as long. And I'd say that speaks huge volumes to the infectious disease community within the United States. It's just that continued desire to evolve and improve how antibiotics and antimicrobials are used. I'd say again, credit to the larger infectious disease community in the United States for that evolution.

PIERCE: Absolutely. When I was in nursing school, I was a pharmacy tech. That's how I got through nursing school. But I remember the Z-Pak was so popular because it was only five days versus, you know, like I take these two, and then I just have four more days of one. And that's why it was so popular is 14 days versus five.

WELCH: And again, to on the patient side, looking at that, right, the patient has probably been sick for two, three, maybe four days, and they finally go in, ask for that Z-pack. And chances are it was probably a viral infection that by day five or six, they were just going to feel better anyways. But they took the Z-pack starting, you know, day four, day five, and they assume, hey, I'm better the next day. So it was that Z-pack. So ,every time I'm sick, I'm going to go get that Z-Pack.

PIERCE: Yes, we did. We had a ton of people come in for the Z-pack. So, what role do healthcare professionals really play in promoting and implementing antibiotic stewardship practices?

WELCH: Yeah, again, we've talked a lot about education and the media can push out education a lot, but again, as healthcare professionals, we're still very well respected. Our patients trust us. And so that education directly from us to the patients is going to be key. And that's not always easy. Again, patients come in, they're feeling terrible. They want something and they're told, stay hydrated, take some Tylenol and it'll get better in a few days. And that can be frustrating. Having that empathy is that education's given can always be beneficial. But again, I think that's the largest thing is just that education to our patients. Other things that we can do as healthcare professionals on our end is making sure we're involving the team, right? We all have different roles in the healthcare setting and making sure we've got that collaborative team set up where we can chat with the physician. We've got a pharmacist, our nurses are very involved with our patients, right? They're usually the best source for answers. If I'm reviewing an antibiotic, whether or not it's appropriate and I have questions, I'm going to go to the nurse because they know the patients. So making sure we have that collaborative team and just that collaborative environment where we can bounce ideas off or if we see a concerning question, we can ask that question and not be concerned about it. Again, patient education, but developing that collaborative on the healthcare side, I think, is also key to promoting and implementing good stewardship.

PIERCE: One of the things that has really changed since I came into the healthcare field is the role of pharmacist, which I'm really glad to see this. But before, we really only saw you guys when you were in a pharmacy. Seeing you on the floor, seeing you in the hospital, seeing you at the bedside, seeing them respond to code, seeing how that interprofessional team has really grown to use the expertise. A pharmacist I think has really been helpful with antibiotic stewardship and pain medication and just giving medications in general to patients has definitely. I'm telling you, yes. Hold on, there's light out here. What is, I've never been out here before.

WELCH: Absolutely. had to, I mean, we had to wear sunglasses when they let us out of the dungeon at first, but it's been, yeah, exactly. What's outside? That's what's not enough. But no, it's been absolutely fantastic to be part of the teams up on the floor, rounding with patients. Again, that collaboration, right? We all have a different part to add to the team that improves that patient care and long-term outcomes. So, it's been extremely beneficial. And again, specifically in this setting of antibiotics, having an extra set of eyes, or again, just, it's a lot easier to go chat with the nurse and the physician when we're there as a team versus calling up from the basement, trying to get ahold of them.

PIERCE: Or I'm calling down to the basement and I'm on hold for a while.

WELCH: So yeah, that's been a huge part of, I think, just improving patient outcomes overall.

PIERCE: I would absolutely agree to that. So going back to antibiotic stewardship, there are a lot of common challenges. Can you kind of walk us through challenges of these types of programs and how we can overcome them?

WELCH: As a resident inpatient, I remember, the thing I hated the most was always having to go talk to the surgeon about their antibiotic use. The infectious disease rotation, our ID pharmacist, that was the resident's job because they knew how daunting it could be at times. So, one of the barriers I think with that is just cultural perceptions. And again, just breaking the mold of our typical healthcare system.

Again, over the last decade, it's definitely evolved. And I think lots of areas have improved. But just that general, hey, you know, you're coming in, where we talked about the Z-pack and breaking that mold, and the culture can be very difficult. And again, tying that back to the education pieces is the key there. Time constraints can be hard to write if especially in the inpatient setting, everybody's stretched thin, there's, you know, multiple patients we're all taking care of. And so having the time constraints there to make sure we're following up on cultures or taking a step back and reviewing that antibiotic therapy again. So, time can always be hard as well. And then if we have inadequate education, whether that's on the healthcare side or the patient side, that can be a little bit hard as well. And I think still one of the biggest barriers is that patient pushback that we see. So again, the culture of giving education, always educating our patients can help break some of those barriers or common challenge.

PIERCE: I'm going to throw you for a loop on this one, but because I know we talk we talk about patients and the human sense, but veterinarians also use antibiotics. And I can give an example, because I talked to one of the snake bite experts, and we talk about that you don't need antibiotics for snake bites. It's not, but yet, you see a lot of veterinarians that still you come in with a snake bite and they're like, well, here's you some antibiotics, here's you some pain medicine and be on your way. So, is that also playing a role in antibiotic resistance, even though it's pets?

WELCH: Yeah, absolutely. Again, when we look at that resistance and how that resistance evolves over time, it might be that we're treating the correct bug with the right antibiotic, but there's still bacteria that's not targeted by that that has some sort of interaction with the antibiotic, and so it's developing that resistance. So it leads to other bacteria developing that resistance. We look, we see it in the farming world as well, right? You've probably seen, you know, chicken now in the stores that say no antibiotic used in those chickens, which I think is a great step towards reducing that overall resistance that we're seeing, not only in humans, but in, you know, in the veterinary population, as well as in our food sources. So reduction of overall antibiotics exposure, whether, whatever setting that's in is definitely going to help reduce that antibiotic resistance.

PIERCE: Right, so it doesn't just affect us in human healthcare, it affects us in agriculture, it affects us in veterinarian world, and it all kind of plays in together role there. So do you have some examples of successful antibiotic stewardship programs and some of the outcomes? I know I shared some overall outcomes for the US, but do you have any examples?

WELCH: Yeah. So, I showed that study that the CDC funded here in Utah. That's definitely been a successful one. I currently practice within the Intermountain Healthcare System. And again, that's been a huge success story. A couple other ones that I've seen some good success from are some allergy desensitization programs. So, these are somewhat new in our area. One of our hospitals has slowly been rolling this out. But one of the things that can lead to poor antibiotic choices are just allergies that patients have listed. There's a lot of patients that have an allergy to penicillin, right? I have a supposed penicillin allergy from since I was two and had a little rash, right? And so, a lot of those I don't think are true allergies. And so, if we can either desensitize those patients, give them little bits over time, or just challenge that allergy,

PIERCE: Penicillin, yep, right here.

WELCH: That's going to give us more options, right? We don't have to go to our second- or third-line options of antibiotics that might be a broader spectrum or more side effects. So that's one of the good programs that this hospital here specifically by me that's been very helpful in identifying those. One

other one that we have that I had as a resident was just an automated system that looked at bug drug mismatch. So when cultures finalized, we got an alert that the culture finalized, then there was an automated system that said, okay, they're on this antibiotic, this is the bacteria, that antibiotic does not treat that bacteria. And that would allow the pharmacist to go in, review that, and then make a recommendation to the care team on that. So just a couple good success stories, but yeah, the allergy desensitization program I'm very excited about, because so far it's had some good results.

PIERCE: When you talk about allergy desensitization, I'll say when I would count out penicillin, you know, it is powdery, and it would get on my hands just getting on my hands. I would turn red and start itching.

WELCH: And that's a right, if you said, hey, I've got to have a penicillin, I would say bring it on because, again, I don't know the minds of true allergy. But that's as we talked about kind of the healthcare team. That's where I think our nurses are extremely beneficial. As they're gathering patient data, patient information, as they're triaging patients, really trying to get an understanding of that allergy what happened, when was it, it helped.

PIERCE: What happened? Yeah. Right. A stomachache. Was it a stomachache and nausea and vomiting because you forgot to eat? Or was it a true rash where you were itching and you know, things were going on on the skin and yeah, trying to determine is it truly an allergy that you can't have this medication?

WELCH: you know, give us a little more direction. Yeah.

PIERCE: Yeah, that was definitely a challenge with a lot of our older patients too, because they're very set on this is an allergy that I have, even though you're like, but well, it was a stomachache. Can we try? Can we just try it one more time?

WELCH: That's again, that education, right? Of, you know what, the stomach upset, that's a side effect. We expect that. It's not an allergy. So yeah, let's try it again.

PIERCE: Absolutely. Well, that is the end of our time for this episode. To our listeners, hopefully you have gained a better understanding of the importance of antibiotic stewardship and the role that we as healthcare providers play in the efforts to combat it. Make sure you check out our next episode in this series where we will be discussing practical strategies and best practices for implementing antibiotic stewardship in daily practice.

Episode 2: Antibiotic Crisis - The Role of Antibiotic Stewardship

Transcript

Candace Pierce: Welcome back to the antibiotic crisis, the role of antibiotic stewardship. In our first episode, understanding antibiotic stewardship, Dr. Patrick Welch and I discussed the basics of antibiotic stewardship, its importance in healthcare and that critical role that we as healthcare providers play. In this second episode, we're going to look closer at practical strategies and best practices that can be used to promote antibiotic stewardship in all clinical settings. And our goal is really to equip you with actionable insights and tools to be able to effectively contribute to antibiotic stewardship and improve

patient outcomes. Dr. Patrick Welch is back with us to walk through these strategies. Patrick, thank you for sticking around to continue this discussion.

Patrick Welch: Yeah, no problem. Thank you for, again, I think this is a very important topic, so still lots to cover.

PIERCE: Absolutely. Well, let's start with, I know we talked a little bit about your residency and having to talk to, you know, surgeons about their cultural practices, we'll say. So, do you have some effective communication strategies that can really help with not just educating patients, but your interdisciplinary team as well?

WELCH: Yeah, again, a lot of it comes down to the education and understanding the why behind it, right? So if we can develop within our system or our clinic, the culture of understanding the why behind why we're asking certain things, why we're making recommendations or why we're always bringing up a stink about antibiotics, can just setting the base there is huge is back to my residency as I was on that infectious disease rotation. Our pharmacist was fantastic. And some of the clinicians, they'd see us walking down the hall and they'd be like, no, now what am I going to get yelled at? So, I think from those that are making those recommendations, or we're from a pharmacist standpoint, if we're going to ask questions or point out, hey, this might be an option, we can make a change to just having that understanding of first asking, hey, tell me what you're treating and why we went with this choice, right? Get that baseline understanding instead of walking in and saying, Hey, now Ancef was a terrible choice. Let's, let's switch it over, and that can help develop that confidence from the team, as well as that collaborative environment where there's trusting relationships going back and forth. And so that communication strategy of making sure we understand we're all on the same team our goals to improve the patient outcomes, as well as reduce our antibiotic use and making sure it's appropriate. That's key to making sure the communication lines stay open amongst the team.

PIERCE: Absolutely. And I think just recognizing the roles that we play and the knowledge that we have, we can't all know every single thing there is to know, which is why you're an expert in medications and you know, they might be an expert in taking care of the patient and whatever area that they that they decided to specialize in, but just recognizing everybody has a level of expertise and how we can all come together and use it together, which as I said in episode one, I've really seen just by pulling you guys out of the dungeon, making you more, you're more out there where we can easily get to you and have those discussions and make decisions together for the better of the patients. So that's a huge step forward.

WELCH: Yeah, absolutely. Clear roles, like we see that in other settings, right? If there's a code, we know our roles, we know what we're doing. And so having those clear roles and expectations that really leverage the expertise is great. As we look through antibiotic stewardship programs, there's certain guidelines out there that kind of help determine roles and how each healthcare profession can have an impact in their program. And I think I'd like to just highlight a couple of those. I'll give a first example for nurses. So, we talked a little bit about nurses in the first episode of triaging, getting adequate patient histories, making sure we understand true allergies and things like that. But our nurses, again, frontline there at the bedside, know proper techniques when it comes to reducing contamination of cultures, making sure our cultures are correctly gathered. Urine cultures are a big one, right, making sure we've got a clean catch there. So, our nurses play a huge role in making sure we get the right data and that it's coming from a true source. They're also very, our nurses are very aware of when their patients can't tolerate things by mouth, right? NPO versus when they can. And so if they're on an IV antibiotic, by all means, our nurses should be speaking up during rounds or chatting with the pharmacist saying, hey, my

patient's now eating, can we switch this IV antibiotic to oral? And so having that open line of communication and that respect amongst the team where anybody can bring up a concern. The other thing that I think nurses are in a great position to do is just speak up if an antibiotics been on for a while, right? If it's been day six, day seven, day eight, and they're still on an antibiotic, maybe we say, hey, what's our expectation? How long should we be on? You don't have to say, hey, normally this is five days. Just bring up the question of, hey, what's our goal with this antibiotic? And so those nurses being at the bedside, bring that up. Our nurses are fantastic at that. So again, and with the communication, making sure we have that collaboration on the team where.

PIERCE: So don't say, y'all remember that they're on it and they had it.

WELCH: We feel comfortable, hey, we can raise a concern, or we can ask a question. It might not be my area of expertise, but I can ask that question to the expert on our team. And that'll give me more information that I need to say, yep, that's a great decision or maybe let's pivot and come up with a different solution.

PIERCE: I want to just kind of piggyback on what you were saying about knowing your roles. And I think that in any relationship that you're in, it's all about how we communicate and our perception, right? That can affect any relationship. And so not only me knowing my role and you knowing your role, but I need to understand your role and those expectations. And you need to understand my role and my expectations so that we are able to be a good partnership within patient care.

WELCH: Yeah, absolutely. I think along with that is also recognizing when, hey, it's maybe out of our scope or we need a little more expertise, right? As we can round as a team, but we should make sure that we've got infectious diseases on the side if we need them, right? They're the true experts in this. And so, if there's a question on the team, we're not sure, I'm going to reach out to my ID pharmacist, right? Or our physician's probably going to reach out to the ID physician. And so just making sure we understand, right, this is above my pay grade, if you will, right? We need to bring in the expert and making sure we all understand our roles, but also when we do need to reach out for that expert.

PIERCE: Absolutely. So, playing into infectious disease, what role does infection prevention and control play in antibiotic stewardship?

WELCH: Yeah, so going back to the resistance portion and how the bacteria develops that resistance, we've talked about exposure to antibiotics and if it's not the drug treating the bug, that bacteria is going to develop those resistance mechanisms. Infection prevention is a huge part of that, right? If whatever bug I have starts to develop a resistance pattern or a mechanism, and then I go out, you know, that bugs in my nose, I wipe my nose, shake somebody's hand, that bug I just transferred over to them, right? So the bacteria is developing resistance within me. And if I go to spread that, that means those around me are going to have a lot more likely chance of having that resistant bug. So making sure we're following proper isolation precautions, making sure, again, we're educating our patients on, hey, if you're sick, let's stay home, let's wash our hands, let's make sure we're doing those proper things so that we can prevent that spread of whatever resistant bacteria we have to others.

PIERCE: Well, to play on this, see since schools back in session, you see a lot of this in locker rooms, MRSA.

WELCH: Absolutely. I mean, my kids just started a couple of weeks ago. I lost my voice last week, probably because of whatever they picked up at school. I don't know if it was my parents or just our education system. When I was in high school, I was a wrestler, and ringworms were common, right? And so, I knew, hey, as soon as I'm off that mat, I'm going to shower. I'm going to clean off because maybe I picked something up. I don't want to. I don't want to get that, right? And so again, that education to just the public on making sure we're proper hygiene, treating things and making sure we're staying strong. And that sharing of things, right? Now with technology in classrooms, they're sharing earbuds, they're sharing everything. And so, there's lots of touch points. Again, proper hygiene is a big thing that we can push to help reduce the resistance that we see with bacteria.

PIERCE: I think that, correct me if I'm wrong, or if you know, but speaking of things that we share and pass along in schools, but lice, it seems like lice has gotten harder to get rid of as well.

WELCH: Yeah, that's a great example because it is becoming harder and harder to treat. I know there can be different opinions on how school districts are managing lice or even if they're telling parents in that classroom that somebody might have been exposed, but yeah, that's a great example of some resistance developing where it's becoming harder and harder to treat that. Again, we can tie that into any sort of antimicrobial resistance that's developing and the importance of making sure we've got good stewardship so that we don't see that develop with bacteria and more fungal infections as well.

PIERCE: So, it seems like that an antibiotic stewardship program may be worth investing in school districts as well. So not just in the hospital setting or the clinic setting, but in a place where we know we share a lot of unfortunate things.

WELCH: Yeah, absolutely. And even in the health department, right, with your city or town, in that health department setting, that's a great way to make an impact, whether you're going out and doing outreach to school districts, or things like that. But yeah, that's a fantastic idea and place, again, where we can have a little bit of impact of just, it's purely education, mostly, right, in those settings. But education that can definitely have an impact down the road.

WELCH: Because most of that is going to play back into infection prevention and control. Let's make sure we don't share the comb, right? Let's keep our hats on our head and not let our friends use them.

PIERCE: This is how we clean pads, but if you're going to share them, this is how we clean them.

WELCH: Yep, yep, exactly, right? So just basic infection prevention techniques at that level.

PIERCE: Absolutely. So what type of data and metrics can be used to monitor and improve antibiotic use and practices?

WELCH: Yeah, that's a great one. Again, we can look at prescribing habits now with electronic medical records. Data is always there. We can pull different data, but yes.

PIERCE: I am going to pause you on this because I have another question. Exactly what you're talking about. We can track the usage of how many are prescribed. Do you think that that's also going to have an opposite effect? And now I'm afraid to actually prescribe antibiotics, which could then also continue to harm.

WELCH: Yeah, right, because if we're scared to prescribe and there's a true infection, definitely can lead to harm and poor patient outcomes. Again, I think I know I've harped on the education component of it, but I think if we have good education to our healthcare teams, that hopefully I don't foresee that causing issues. If we look back at that study we talked about in the last episode, with Intermountain Health and University of Utah, they did share that data amongst those providers. And so, they could see, okay, this is how I compare, ooh, I'm really overdoing it. But even with that upfront data sharing, those outcomes were improved, right? Patient outcomes improved the number of antibiotics prescribed for unnecessary conditions improved. And so, from what I've seen, I haven't had that concern yet of it's preventing treatment in those patients that absolutely and necessarily need it. And as clinicians, our clinicians are very well educated. They've gone through that training of what a bacterial infection is and what it looks like and how people might present. And so that's a great concern, but I haven't seen it specifically, but I mean nobody likes to be micromanaged. Nobody likes to have that specific oversight. And so, I can definitely see that cautionary creep in.

PIERCE: Start to doubt yourself a little bit. Yeah. So when you're talking about the data from that particular study, how do they determine if, you know, maybe this physician has a higher rate for prescribing for this month and then the other one, but maybe he actually saw more who needed it. So how did how do they look at those metrics? How do they track that data?

WELCH: Yeah, so we can tie it not just, you know, who prescribed what medication, but we can look at the diagnosis code, right? The reason they were in for that visit and what the ultimate diagnosis was. I think one thing that's important to also pair with that or make sure we acknowledge as we're looking at that specific prescribing trends is what's going around in the community, right? What are we seeing in the community? And so let's track cultures or viral swabs that we're getting and let's see what's going around because there might be a couple months where we've got higher air infections for whatever reason and we're seeing more and more air infections, right? Or if we look on a flu side, maybe we're giving a lot of Tamiflu for patients because that flu's up. And so making sure we're not only looking at one specific data set, but taking the full picture, seeing what's going around. And again, comparing that not just from clinician to clinician in a specific setting, but the region or the area and let's see how other clinics are because I bet now most of the time you would see if we're seeing certain clinicians with higher prescribing during a specific time, the other areas are going to have probably similar prescribing patterns with that.

PIERCE: So they didn't just look at one clinic, they looked at it across the entire system.

WELCH: Correct, yeah, and in fact that study with Intermountain and University of Utah, have, I don't know the number, but there is a lot of urgent care clinics within those system networks. And so there was a very large population that they looked at with that specifically. But yeah, with the stewardship program, again, making sure we're looking not just at individuals, but as the system itself. And if we see something that's concerning, I think it's important to point out that we should be targeting the system. We should be looking at the processes and see if that's what's contributing to it and not single out an individual, right? But give the education overall and then reevaluate our system, reevaluate our stewardship program and making sure that that's not what's pushing these clinicians to prescribe one way

PIERCE: Now, when we're talking about using data and also educating our providers, do you see that there are some maybe older versus younger who are kind of set in their ways and they're harder to get

them to understand versus some who are like, yeah, no, I totally understand where this is going and I'm going to do my part to keep this from happening.

WELCH: Yeah, yeah, I think so. And I think those that have been in a healthcare setting for a while have probably seen a little bit of evolution where now, and even in training, as different providers go through training, there's a lot more of a team approach, right? Even in school, there's a lot more focus on a team approach. And so that training has evolved where, you know, our older or more seasoned colleagues didn't have that same collaborative team. A lot of times it was, they were the ones doing everything. And so they didn't have the ability to reach out to infectious disease or didn't have the pharmacist on board, didn't have, you know, a stewardship program. And so they have been accustomed to, this is what I do. This is how I treat it. Whereas the up and coming healthcare professionals have gone through that training and have come to understand. We deliver healthcare best when we're in a team setting and that collaborative setting. And I would say credit to those older healthcare providers that have been out in practice for a long time because I've seen a lot evolve and they have been more than willing to say, hey, we've got a team, this is amazing, let's work as a team. again, that cultural, overcoming the cultural deficiencies that we might see in that setting. I think has definitely made substantial improvements where I don't have, in my practice, is I haven't had a whole lot of concerns with that as again, most are open to having additional help and having that team approach.

PIERCE: Absolutely. What are some practical tips for really ensuring that we're adhering to the guidelines that are set for antibiotic stewardship? And there are already guidelines out there, right? Is it the CDC that has the stewardship guidelines?

WELCH: Yeah, there are. So, the CDC actually has a really good website to look at and they base it off your location. So, whether you're an outpatient clinic, inpatient, if you're in the health department, they have resources for that as well. And they walk through basically step by step on, again, what is an antibiotic stewardship program? How can we set it up? And not just setting it up, but that reevaluation of your program. And so looking back, anything we do in the healthcare setting, again, we like to reevaluate, we like to debrief, is we all went through training, remember running fake codes and having the debrief session after, right? Let's think of antibiotic stewardship like that as well, where we always need to have a little bit of a step back, let's reevaluate, you know, the data gathering, each role, make sure that we're implementing those roles and have that step back and look at it. And as we look at the roles that we play in our program. Again, having somebody that's the accountability expert for the program is key. And again, it works best if it's multiple people on that or a committee, so that everyone's got some sort of accountability that we're reassessing and re-evaluating all the time because this changes, right? This topic always changes. Our bacteria are evolving, and so we need to make sure we are evolving with it.

PIERCE: Absolutely. What are some stewardship policies and practices that are important to have within the organization to be successful?

WELCH: Yeah, think, again, I think recognizing that everybody's going to have a role in it. And so, the policy should specifically call out roles, right? I think I've got a fairly good example in within the system that I work in, we have in our emergency departments, we have a UTI callback from our pharmacist. So patients come in, have a UTI, we get the culture, they're sent home right then with some sort of antibiotic And our pharmacist wants that culture comes back our pharmacists have a collaborative practice agreement where they will look at the culture if the bacteria doesn't match the the Antibiotic that was given they're going to call that patient and they're going to make the change They don't have to

go and get the okay from the provider, right? We already have a diagnosis. We've got the bug We know the source and so the pharmacist can make the appropriate change on that antibiotic and so as we look at those policies making sure that we have policies that allow each expert on that team to work to the full scope of their license, right? Making sure we're not handcuffing them and saying, well, you have to do this and this. And then again, the policy shouldn't be anything that people are concerned about, right? I don't want our provider to not prescribe the antibiotic because they're worried about backlash that they might get. And so making sure that policy again is focused on the system itself or the processes and not penalizing an individual for that. And really that's, think what leads to more collaboration in the team. Nobody's scared to speak up. Nobody's scared to make a wrong decision because they know it's going to be evaluated, but there'll be education and it's going to be more of a system approach instead of trying to call out a single individual.

PIERCE: I think that's really important too, is to feel that your team has your back, but to also be aware that we do make mistakes. We might interpret something incorrectly, you know, but to learn from it, to learn from our mistakes. Yes.

WELCH: Yeah, absolutely. Absolutely. that's interpreting things incorrectly. We've all seen it. I've done it. Those on my team have done it where we see a culture. We quickly glance at it and think, hey, this is the right decision. And it takes, again, somebody on our team to speak up and say, hold on, let's look at that culture again, right? Like, what were you thinking, Patrick? Yeah, right? Let's remember where that source came from and what we're trading with that. again, just that ability to have that collaboration on the team and the comfort level of being able to speak out is key.

PIERCE: It's interesting that you're talking about, or we're just talking about mistakes, but when I think of antibiotic resistance as a whole, I think all of that is learning from our past mistakes. We are now dealing with the lack of understanding that we had when antibiotics came about. So now we are having to backtrack to deal with the mistakes that we made in the beginning when we first had antibiotics.

WELCH: Yeah, absolutely, right? And that's the key going forward is that's what we're trying to prevent is more of these superbugs, more of these resistant bacteria and changing that and change is always hard. We see change all day, every day in the healthcare setting, but really making sure we can focus on it now is going to pay dividends down the road to really prevent further poor patient outcomes because of resistant bacteria.

PIERCE: Are we seeing antibiotic stewardship programs opening up in things like agriculture, not just in healthcare?

WELCH: Yeah, so we talked about the CDC's website and guidance there. They also have a portion of that website kind of dedicated to agriculture, dedicated to, again, we talked a little bit on the veterinary side of things and things like that. So again, it's a whole community effort for antibiotic stewardship, not just in the healthcare setting, but our farmers, those working in the agricultural setting, those dealing with livestock as well. So it's a whole community effort to really make sure we're utilizing those antibiotics only when necessary to prevent that further resistance.

PIERCE: Are you seeing any new horizons of antibiotic development or even newer antibiotic resistance that maybe isn't being talked about as much yet?

WELCH: Yeah, so there are new antibiotics in the pipeline. The first episode we talked a little bit about how we've had a long period of time without really any novel mechanisms for antibiotics. And again, a lot of that is there might not be a whole lot of incentive from a financial standpoint to those that are developing medications. But over the last couple of years, there's been a little bit of a pickup in that where we're seeing a little bit more and more come out. Again, one of the hard things can be, hey, we've got an infection, we know how to treat it, but is it ethical to give somebody an antibiotic that might not treat it? Right, so that can be a barrier to some of that new medication development as well. But I would say as these newer medications come out, I think it's key to make sure if we're considering using a new antibiotic that comes out, making sure we're involving our infectious disease team. Because again, we don't want to get a new antibiotic that we think, great, this is fantastic, let's start using it. And we're in that same cycle of great, now we're creating more resistance to this. So again, as new medications come out, new antibiotics come out, which there's more in the pipeline, it's important to make sure we don't get excited and overuse that from the start and making sure we're involving those experts on whether or not that therapy is appropriate.

PIERCE: Absolutely. Do you have any resources and training opportunities that you might want to highlight?

WELCH: Yeah, so again, I know I've spoken about the CDC. They have great resources regardless of your practice setting. If you go to their website, if you just do CDC antibiotic stewardship, that'll pull up a whole bunch of resources and training modules. They also have some good patient handouts. And so we've talked about patient education and making sure we can get that education out to patients. They have some good patient handouts there as well that are easy to read you can quickly hand out to patients. Another one I'd recommend is just the IDSA stewardship page. So Infectious Disease Society of America. They also have some really good resources on antibiotic stewardship. Obviously, they're usually our kind of gold standard guidelines that we're looking at in this realm. And so they have some really good resources to go to as well. But there's plenty of resources out there. I'd start with the CDC website click on your specific practice site setting and go from there as it's a very comprehensive overview.

WELCH: That's really good to know. So, there are some really great resources there. So, Patrick, before our time ends, I want to try to wrap up some of what I kind of took away as some key takeaways from looking at this. But first we know that if we don't continue to do something, this is not just a USH threat, this is a global health threat. So there really is an urgent need for effective antibiotic stewardship. We could really see devastating consequences as early as 2025 economically and with loss of life if we really don't heed these warnings and become effective stewards of the resources, including the new ones that we have in our pipeline, because we don't want to repeat this again. The others that I took away is that nurses, even nurses, we really do have a vital role in antibiotic stewardship from. You know, just even like you said, monitoring antibiotic use to educating our patients on what really is an allergy and when do you really need an antibiotic and, also helping to implement infection control measures and holding people accountable in these infection control measures. Because not only do we need to reduce and preferably halt inappropriate antibiotic use, but we need to also prevent the spread of resistant bacteria. And then lastly, if your hospital or clinic does not already have an antibiotic stewardship program in place there, this is a really great initiative. We've seen the data that has really proven that this can substantially reduce antibiotic misuse. So is there anything else you want to emphasize before we end?

WELCH: Yeah, no, I would just say that last point. If you don't have a current stewardship program, just speak up, right? Ask leadership, ask somebody, speak up, bring that to your attention, and that's going to

start getting that ball rolling. And if you don't know where to start, again, go to that CDC website. They have a good plan to kind of get things up and rolling.

PIERCE: Yes, that's a really great resource. Thank you so much, Patrick, for making time for this discussion today.

WELCH: Yeah, thank you.

PIERCE: So to our listeners, thank you for taking time to listen to our discussion and equip yourself with the knowledge needed to provide amazing care to your patients. I also encourage you to explore many of the courses that we have available on elitelearning.com to help you continue to grow in your careers and earn CEs.