Clinical Education Initiative
Support@ceitraining.org

ECHO: UPDATE ON OUTPATIENT MANAGEMENT OF URINARY TRACT INFECTIONS

Eric Heintz, MD

03/08/2023

ECHO: Update on Outpatient Management of Urinary Tract Infections
[video transcript]

00:00
All right, I'll hand it over to you now Dr. Heintz, thank you.

00:12
Alright, so as I said, today, we're going to be talking about outpatient management of urinary tract infections, excuse me, which is certainly a common problem that we all run across in our practice. And to start off, I'd also like to say that I have no financial disclosures. But just to kind of organize, you know, what we're going to be talking about today, really everything we talk about, we're going to try to meet these objectives here. So the first objective is to just identify the common bacteria that are often found in urinary tract infections. Then to describe the common empiric or sort of upfront educated guess antibiotics that we use for treating uncomplicated cystitis, or bladder infection versus pyelonephritis, or kidney infection. And then finally, we're also going to review some of the challenges with treating these infections in terms of the development of antibiotic resistance, and why, you know, all of us should be practicing antimicrobial stewardship, and why that's, that's so important for our individual patients, and also our communities. And everything that we talked about here is really, for the most part pulled from the guidelines from the Infectious Disease Society of America or IDSA. So I don't know if any of you are familiar with using the IDSA website. But basically, there are guidelines for almost any infection and any, almost any organ system you can think of. So today, we're mainly going to be referring to the guidelines regarding uncomplicated bladder infections and kidney infections. And then also a little bit about asymptomatic bacteriuria. There are some separate guidelines for catheter associated urinary infections, but we won't be really delving into that too much time today, just in the interest of time. Alright, so to make this interesting, I really thought I'd present it in the form of a series of cases that, you know, these are all fictional cases. So, you know, there's no personal patient information that we're sharing. But all these cases are based on real scenarios that I've seen over and over again in practice, and that you may have seen as well. So starting with case number one, you're getting a call from one of your clinic patients on a lead on a Friday afternoon. So she's a 30 year old woman with no known past medical history, she just transferred care from another clinic. So you know, you don't really know much about her, other than she's calling because she believes that she has a urinary tract infection. So again, I want to make this a little bit more open ended. So if anyone wants to type either type in the chat or if they've switched over to the panelist view, raise their hand and unmute, you know, what are some things that you'd want to know from this patient?

03:00
I don't see any comments yet. My first thought would be kind of what are your symptoms?

03:06
Exactly. So what's going on with their feeling?

03:10
Yeah. And yet we have a comment about onset of symptoms. So maybe timing severity. Prior another comment on prior history regarding the issues prior history of UTI antibiotics. Okay, great. Yeah. Great thoughts.

03:37
Nothing else listed in the chat. Because we are in a sexual health session, I would also ask about sexual health history. Couple more items coming in yet history of STI, any measures that they've tried at home to try to relieve symptoms or treatment? Perhaps? Yep. Yeah,

04:00
these are all fantastic thoughts. So hopefully, I managed to capture all this questions with the following history. So she tells you that she's been having some burning with urination and urgency. She denies any fevers. She denies any flank pain. She's not currently sexually active. She denies any vaginal discharge or any lesions. She says she's had about two other UTIs in the past. The last one was two months ago and got better with an unknown antibiotic. So she doesn't remember the name of it. And this feels pretty similar to that. And let's say you know, this came on pretty recently. It wasn't something that was there in the background. This maybe started just one or two days ago and it hasn't gotten better on its own with drinking water and and maybe over the counter analgesics. She has no other medical problems. She's not taking any other medications. And she doesn't have any outlet. She's to any medications that she's aware of. So what would you want to do for this patient? So I made this multiple choice. And there's not necessarily a right or wrong answer. So option A would be, you could prescribe a per diem for discomfort and tell her to drink some water. Choice B, you might, you could check a urinalysis with reflux to culture, and then wait for those results. But for prescribing an antibiotic, choice C, you could prescribe or nitrofurantoin, which is macrobid. For five days, choice D, you could give her Ciprofloxacin for three days, or choice E, you want to send her to the hospital to get intravenous cetera axon. Any thoughts about any of these choices? Again, there might not necessarily be one right or wrong.

05:46
We've got to vote for B and C. Okay. Couple more for C. We have one comment, probably from the previous that says you might would you want to know previous culture? If she was treated appropriately if the organism was an MDR? That sounds like you don't have that. But

06:08
so we Yeah, so we have history that she she got some sort of an antibiotic. And she did feel better after that course. But we don't know what that antibiotic was.

06:19
We've got a, b and c and one person come in, be perhaps with an empiric antibiotic following the urine sample?

06:28

Yeah. So I agree with that. So, you know, if you had to pick one choice, you know, I think I might pick choice C, but really, choice B and choice C are not mutually exclusive. So you could be you know, it's a Friday right now, you could check the urinalysis and culture, but you may not, you know, unless you're checking the results on a weekend, you may not see that until the following week. And so in the meantime, you know, it sounds like she's otherwise clinically Well, she's just having the dysuria. She has no known history of MDR O's that we know of. So it would be reasonable to prescribe or just the empirical nature of pure Antolin. And then, you know, maybe follow up that urine culture the next week. All right. So what we're talking about here really is acute, uncomplicated cystitis. And by this in terms of symptoms, we're referring to things that really localized to the bladder, so things like dysuria, frequency, urgency, suprapubic, pain, maybe hematuria. But specifically, we're seeing that there's an absence of symptoms that would might suggest an upper tract infection, like pyelonephritis. So if the patient is having real high fevers or chills with flank pain or tenderness, then you might be more concerned that this is not just uncomplicated cystitis, but might in fact, be pyelonephritis. And then, as some of you alluded to, you know, some of the symptoms of dysuria are, for example, might overlap with your arthritis from sexually transmitted infection. So you want to make sure that that's not what's actually going on that you could be missing. In terms of the microbiology, one really important take home point here is that the most common organism by far is E. Coli. And this is somewhere up to 95% of cases of UTI are actually attributed to E. Coli. And this is important because when we talk about empiric therapy, or basically educated guess, therapy, all of this is really based on what E coli tends to be susceptible to. But E coli is not the only bacteria that causes UTI. So a lot of the other bacteria are also things that are found in your gastrointestinal tract. So example, examples of organisms like Proteus Klebsiella, similar organisms that we call gram negative bacilli or rods, some gram positives, like Enterococcus, which is a GI type of organism. And then staph, separate Pittacus is something that can be a colonizer of the genital urinary tract more in women, but can cause can rarely also cause UTI and men as well. And so, you know, the question here is, you know, then why is why are we saying in this circumstance, it might be okay to just give empiric treatment? So, one thing that was not been noted in some older studies, more so cohort studies, that it turns out that in patients with acute uncomplicated cystitis, the rates of just self resolution can be somewhere between 25 and 42%. And this was determined based on either some really old studies where they actually gave patients placebo, or what basically turned out to be placebo because they were prescribed an antibiotic that would not have worked against the bacteria that it turned out to grow from the urine. So it basically would have been no better than a sugar pill. But that doesn't mean you shouldn't, that you should just ignore it and not treat at all. Because it turns out if you were to give a patient in a placebo or ineffective antibiotic that is associated with longer duration of symptoms, and then in one study, it turns out that patients who are given placebo actually did. What about One in 30, women ended up developing pyelonephritis, which is obviously something more severe that you want to avoid. So, we do recommend treating acute uncomplicated cystitis, even though there's maybe a one in four chance those symptoms could go away without effective treatment. But it's, you know, because it's at least in patients who are otherwise well, the consequences of you know, being wrong are not necessarily that high risk. So if you get the culture back on Monday, and it turns out that organism was resistant to nitro appearance, so And chances are, you could probably, you know, switch the antibiotic, and the patient will do just fine. And so in terms of which antibiotics to prescribe, you know, what goes into that, that choice. So again, as I said

before, this is really based on the susceptibility pattern of E. coli. And this might vary from region to region. So, you know, one thing our microbiology lab publishes is what's known as an anti bio gram. And I'll show an example of that in just a lit a little bit. But this is a list of bacteria and a list of antibiotics and what percentage of those bacteria are susceptible to that antibiotic. And then in choosing an antibiotic to give, there's this this idea of a balance between efficacy versus collateral damage, so obviously, you want to use an antibiotic that's going to be effective, because otherwise, it's not going to work. But at the same time, you don't want to use an antibiotic, that's going to have a lot of side effects. And when we refer to collateral damage, we're really talking about killing off good bacteria that live in your GI tract. So like I said, a lot of the same germs that cause UTI, are things that are supposed to live in your colon, and they belong there. And by taking antibiotics to kill off the UTI, you may inadvertently kill off some of those good bacteria that live in the colon and could put your your patient at risk for things like C diff, and can work you can teach those bacteria that live in the Colon Naturally, to gradually become more and more resistant to antibiotics. So down the line, if a patient does get another infection, those same antibiotics might not work anymore. And so it turns out that there's some antibiotics that have been around for a while now, including nitrofurantoin, or fosfomycin, which remain very highly effective against E. Coli in the urine, but have almost no effect on the good bacteria that live in your colon. So you know, that's why these are often firstline regimens. Other antibiotics, like Ciprofloxacin might be very effective against Ecoli in the urine. But unfortunately, they'll also have this collateral damage killing off some of the good gut bacteria. And they may also be higher risk antibiotics for provoking C Diff colitis. So it's not that you can't use them, it's just that if you can get away with nitroflare Antolin, that's probably a better choice. And this is an example of what an antibiogram might look like. So the top row here, you'll see E coli, which is really what we're interested in here. And then along each of these columns, you'll see different antibiotics. So just some things to point out from this particular antibiotic Graham, only about 48% of the E. coli was susceptible to ampicillin. So you may not want to prescribe ampicillin or amoxicillin as empiric therapy, if you don't know what the susceptibility is are for your patients UTI. For medications like trimethoprim sulfamethoxazole, which is Bactrim. This is about 76%. ciprofloxacin, 76%. But if you look at nitroflare, Antolin, it's actually 98%. So for, for this E. Coli in the urine nitrofurantoin, just statistically, in this community, stands a pretty good chance of covering E. Coli. And so you know, this is really important in terms of thinking about antibiotic stewardship, because uncomplicated cystitis is actually one of the most common reasons for patients to get antibiotics who otherwise, you know, might not get antibiotics. People who are relatively young, healthy, don't yet have a lot of comorbidities. If they're getting antibiotics, there's a good chance it's because of cystitis. And there's, you know, if you prescribe and, you know, an overly broad spectrum antibiotic, you're causing risks to your patient, including, you know, direct side effects, C. diff, like we talked about, and then colonization with more resistant organisms. When we talk about resistant organisms, you know, that we're really talking about what we call gram negatives in this case. So I think, you know, I know we have a pretty diverse audience here. And so people might have different backgrounds in infectious diseases, but you know, one thing I think the general public is aware of is, is MRSA, which is what we call a gram positive organism that's often implicated in skin infections, joint infections, but a lot of people don't know about this other category of resistant bacteria called gram negatives, which are really for the most part what we deal with, if urinary infections. And so some of these resistant organisms include things like pseudomonas, which is a bacteria that just in its very name He is

already resistant to a lot of oral antibiotics. But then there can be more resistant versions of other bacteria. So E coli can start out susceptible to a lot of different antibiotics. But it can learn to basically produce enzymes that chew up antibiotics that that it sees. So it can become something called the ESBL. Or even worse, something called a CRE, which stands for carbapenem, resistant enterobacteriaceae. And these are bacteria that are not only potentially resistant to oral antibiotics, but even resistant to some intravenous antibiotics as well. And so this is a risk not only to the patient, but also at a population level. So even if you're not you, one individual patient may not necessarily have one of these resistant organisms. If you're prescribing a lot of antibiotics to many different patients over time, you know, these bacteria can actually exchange information with each other and sort of teach each other to become resistant. So at a population level, your practices just in general can can actually really influence that anti bio gram that I showed you.

16:05
So what does IDSA say about impure treatment, so as you might guess, nitro pure Antolin, for uncomplicated cystitis is one of the first line choices that's recommended. If for whatever reason, you can't use nitrofurantoin, you might wonder about trimethoprim sulfamethoxazole, which is Bactrim. Basically IDSA says it's okay to use Bactrim. As impure treatment, if your local E coli resistance is not more than 20%. Now, in the antibiogram, I just showed you, it was about 24%. But I would say if this patient's not terribly sick, and really only has that dysuria, I might still be comfortable with with giving them the Bactrim. But probably that would be making me all the more inclined to get that urine culture along with it just to make sure. And then lastly, among the first line regimens is something you may or may not have used before called phosphor Meissen, which actually, it's an antibiotic that it's not new, it's been around for a while. But it's just something that hasn't not a lot of people know about. And it's an antibiotic that comes in a packet form. And be given can be given as a single dose. And it works very well in the bladder, it can work against some of these more resistant organisms. But it should not be used if there's any concern for for kidney infection, because it really only works in the bladder. As I sort of said before, you know, you can still use other broader spectrum antibiotics, like ciprofloxacin, for example, or cephalosporins. But these, you know, may have more effect on the on the collateral damage on that your bowel flora. And, you know, as I showed you with the antibiogram, some of these antibiotics, like the cephalosporins, may not be all that reliable as empiric therapy. So if you can use one of these other choices, you should try to do that first. And IDSA really specifically does not recommend using ampicillin or amoxicillin unless you have the susceptibilities back, just because the resistance is assured you can be close to 5050 with in terms of susceptibility. All right. Now, I don't want to spend too much time on this slide. But one thing you know people don't sometimes get very caught up on is this distinction between complicated versus uncomplicated. And depending on the source that you read, you're gonna find different definitions for this. You know, if you go up to date, for example, they might say something different. And sometimes people kind of get caught in the weeds about, you know, if somebody has diabetes, that's that make them considered complicated and do it. Does that mean I can't use nitroflare Antolin? Or if it's a man, you know, do I always have to call that complicated cystitis? And I can't use nitroflare and tolon, even though his symptoms are really just dysuria. And I don't find that distinction very helpful. In my mind, I think it's more helpful to think about sort of three things. Number one, is this upper lower, am I is it the bladder, or the

kidneys that I'm worried about? Number two, does this person have some sort of anatomic reason why it might be more difficult to clear the infection? So do they have kidney stones for example, that might have tons of bacteria sitting on them? And if I give them a relatively short course of antibiotics, they might have a an early relapse of symptoms? And then number three, does this person have a history of resistant organisms and so I might not want to use the typical empiric therapy. I might not I might need to resort to something a little bit more restricted upfront. So I think, really, that's the more helpful way I like to think about it right, rather than trying to put these patients into just boxes of complicated versus uncomplicated. I if I have a man with diabetes who has never had a UTI before, but has clear symptoms of cystitis and, you know, we've ruled out STD I'm perfectly fine treating that patient with nitroflare until and even though some might call that complicated UTI. So moving on, so if she calls back on Monday saying that she's still having the dysuria and urgency, and we'd prescribed her the nitroflare and tau and she denies any fever or flank pain or vomiting. You happen to get results from her previous provider. And it turns out that her last UTI actually was an extended spectrum beta lactamase E. Coli. So, a pretty resistant bacteria. And then it turns out, she is also at two episodes of C. diff that she forgot to tell you about. But thankfully, we did decide to get that urine culture on Friday, just in case and this is what it showed. So we've got that same ESBL E. coli, it's more than 100,000 Count. It looks like it is resistant to the nitrofurantoin that we gave her. It's resistant to a number of different oral antibiotics, but it looks like it is it's susceptible to intravenous SEPA PM, it's susceptible to tobramycin. It's susceptible to Ciprofloxacin. It is intermediate susceptibility to pepper, so Intesa back to him. Any thoughts about what you might do for this patient? Again, there may not be one right or wrong answer.

21:15
From the comments, we have tried Cipro,

21:18
so So Cipro could be could be an option for this patient. So we know that it would work against this E. coli, and it is available in oral form, obviously. But what's what's the drawback of giving Ciprofloxacin? Just thinking about her history,

21:35
the humans and she has a history of the death. Yep. And another person suggested maybe considering hospital for IV therapy.

21:47
Yeah, so again, if Ciprofloxacin is a fairly high risk antibiotic associated with C diff, so if we could avoid it, if we could use something else, that might be a good idea. If this patient were really sick, then you know, sending her to the hospital might be the right thing to do to give her let's say intravenous, separate PM. But right now it sounds like all she really has is the dysuria. Are there any other options for something we could think about giving her that may not be listed here?

22:17

No comments on other options yet, but one person did say she's not sick enough for hospitalization? Oh, we've got one suggestion for fosfomycin.

22:33
Yeah, so phosphorylation is what I'd probably go with here. You know, we don't technically have susceptibilities. But in general, if a patient has never taken fosfomycin, before, it's probably unlikely that there would be resistance, because it actually has its own separate mechanism of action. So just to talk a little bit about it, you know, this is not a new antibiotic by any means. It's actually been around since 1969. As I said it, it has its own unique mechanism of action. It's indicated for acute uncomplicated cystitis, but it really does not reach high enough levels in the kidneys, so you can't use it to treat pyelonephritis or an abscess next to the kidney. It even if somebody has a really resistant organism, like an ESBL, positive organism, it may still work. It's considered a pregnancy B category. And Ad one thing that's also nice about it is that it's actually going in most cases as a single dose, so you comes in a packet, you're trying to mix it with some water, orange juice, and they take that dose and it's actually has a relatively longer half life in the bladder. So it's still treating for a while even after that first dose. And then another nice thing about it is that it has a very low impact on bowel flora. So in a patient who has had a history of recurrent Sita, for example, you really don't may not want to shake things up in their colon in so phosphorylation should be a pretty low risk antibiotic for for precipitating C. diff colitis. Alright, so moving on to the next, how

24:03
can I pause you for one second, we have a couple of questions that came up. So one person asked if that's your oxime would work.

24:13
So probably based on this isolate, if if it's resistant to asset track zone, probably it's resistant to sap your oxime. And so, basically, if you have an isolate that's resistant to third generation, intravenous sporrans, then it's probably going to be resistant to all oral options. You know, our lab doesn't usually formally test those because we just sort of extrapolate. And so if you were going to sample a spore, you know, the only option listed here would be intravenous F a PM. Some other stuff. It's porns may work like two toll is in a wizard or advocate as subtask. It may be back to him, they work, but these are all intravenous things. So I'm really not I would not prescribe any sort of oral cephalosporin for this patient.

25:05
And one person wondered about tilbyr Meissen, but for the usual it's an IV and it's an Amino glycosides.

25:13
Yeah. So, you know, aminoglycosides. This may come up in a little bit with the next case too. But, you know, aminoglycosides, the way that they work are really dependent on how high of a level you can get in the blood all at once. Normally to do that, it you really have to give it intravenously. Sometimes you can give intramuscular aminoglycosides for some indications. But the thing to note is that that dose that the maximum dose is usually in a single vial of

intramuscular aminoglycosides, you know, I think the maximum is around 120 milligrams. And usually most dosing, if you're going to use an aminoglycoside it's weight base that usually somewhere between three to five Meg's per kid, depending on whether you're treating cystitis or pyelonephritis. And even in somebody who's normal weight of 70 kilos, let's say that would end up being like three vials. And that's when you start to really worry about the toxicities because the toxicities from aminoglycosides are really from not clearing the drug fast enough. And so those side effects can include things like kidney injury or hearing changes. So a lot, probably, I would not give an Amiga side for this patient and less, you know, there was really no other options. And you know, and she's refusing to go to the hospital, for example, and we wanted to do something, but I probably would not choice and you know, aminoglycosides resistance can also develop. So it's a good thought, but probably would not be what I would go to upfront, I think, you know, if you can just throw Meissen, then it probably would be what I would go with. Even though it's not a new drug. Sometimes insurance won't cover it or pharmacies won't carry it. So that's one little that's one drawback for the fosfomycin.

27:09
was gone links. One lingering question from your discussion on empiric antibiotic therapy. So what are your thoughts about using empiric doxycycline. For uncomplicated cystitis, the pattern in our STI center is to use Doxy, with the justification that it would cover some STI, as well as UTI, bolstered by the knowledge that our patient population may not always follow up for treatment.

27:33
Yeah, so doxycycline is a little bit controversial. So you know, for a lot of us bacteria like E. coli or Proteus or, you know, Pseudomonas. You know, in, in most situations, we don't think of those bacteria as being susceptible to doxycycline. So for example, if you had E. Coli in the blood, probably wouldn't treat that with doxycycline. There is some thought that tetracycline genes, including doxycycline, can sometimes get such high concentration, they do build up levels in the bladder so high that they may work against things that they don't ordinarily treat. So this is, you know, for things like Enterococcus, for example, the lab may actually report susceptibility for urine only, that you can find some very, very old case reports from, like the 60s talking about people treating even Pseudomonas in the urine with doxycycline, which again, you don't doxycycline normally does not work against pseudomonas, I don't want you to come away with that thought. But, you know, the thought is that maybe it's just accumulating such high levels in the bladder that it was able to work. I, I'm kind of skeptical about that. So I think, you know, doxycycline will work against some things, but not everything. Certainly use doxycycline for, for STI. And if you know, if that person that has, let's say you're treating them for gonorrhea, and you're giving them intramuscular stuff, correct, so And while the subtraction was probably taking care of a lot of other organisms, too, but I would not necessarily be confident that that if you give them doxycycline for chlamydia, let's say that, that you're for sure eradicating a UTI. So if that person does not have resolution of symptoms, and it's not because of, you know, reinfection with chlamydia. I probably would check a urine culture just to make sure there isn't something in there that that wouldn't be treated. All right. Any other questions? All right. So moving on to the next case. So now we're seeing a 55 year old woman with a history of morbid obesity, diabetes, high blood pressure and kidney stones. She's complaining a three day history

of pain with urination and urgency but for the past day, or All of a sudden she's now felt some right flank pain and nausea and she's having trouble keeping po down. She's reporting some chills and just looking at her she looks uncomfortable and ill. So her vitals show, you know your blood pressure is 96 over 54 when normally she's got hypertension. Her respiratory rate is 22. She's got a fever to 38.2. And on exam, you notice that she has some tenderness in the right costovertebral angle. So what do you want to do for this patient now? So do you want to check your your analysis and culture and wait for the results before prescribing antibiotics? Do you want to prescribe her nitroglycerin parent o n times five days, give her a single dose of fosfomycin Prescribe her Ciprofloxacin for seven days or admit her to the hospital to receive intravenous scepter X on the one gram.

30:54
We've got votes in the chat for E admission to the hospital workup for sepsis. Don't wait for results. Septic until proven otherwise. Fluids IV antibiotics, one one person suggested a CT or an ultrasound to look for a stone.

31:16
Yeah, so. So this patient is definitely sicker than the previous patients. And as you quickly saw, you know, she definitely meets service criteria for sepsis. So she's got tachycardia to kidney, she's got a fever. And you know, she looks ill so she is somebody that probably we'd be sending to the hospital. Because we have suspicion for pyelonephritis. And, you know, we vary like we certainly would want to get the your urine culture when she's there, but we wouldn't want to wait for that before giving her antibiotics. And in her case, as long as there's no contraindication, we most likely would be given her scepter axon for pyelonephritis. And so, you know, in terms of diagnosing power nephritis, you're looking for symptoms that go beyond just cystitis. So specifically, you're looking for flank pain, maybe fevers, chills, nausea, inability to keep down Po, these patients may be much sicker. For all of these patients, no matter what you do want to get your analysis with reflex to culture and susceptibilities. But you should not wait for those results before starting therapy. And one thing I think you all quickly realized is that in this case, you don't want to use nitrofurantoin or fosfomycin. Because even though these might work really well in the bladder, they don't reach sufficient levels in the kidney parenchyma for the purpose of treating Hailo. Now, is it okay to sometimes treat pile low in the outpatient setting? You know, this is a question we sometimes get. And this really depends on a patient by patient basis. And I would say for me, it depends on a few factors. So first of all, is the patient hemodynamically stable. So in our patient, this, you know, effects fictional patient case that you know, this patient was clearly beating sepsis criteria, they were not stable. That was somebody you had to send to the IDI. But let's say this was somebody who really was just having the flank pain, and otherwise all the vitals were fine. What wasn't having fevers or chills? Well, is this somebody who's a reliable patient that we can really, you know, follow up on, you know, maybe, you know, it's a Monday and so we know that we're going to be able to follow up the very next day, this is somebody who always, you know, answers your phone call uses their, you know, EMR to send you messages and you know, that you're gonna have no problems getting in touch with them. And if you tell them, they need to come to the hospital, they will do so immediately. You know, maybe that's somebody you can think about outpatient management, and then, you know, do they have any history of resistant organisms? So if this is somebody I knew had a history of an

ESBL or CRE, then forget about it, you know, I want to send that patient to the hospital. But, you know, if, in the rare case that somebody you know, meets all these criteria, you could potentially think about impure treatment on an outpatient basis. And what you use, again, depends on your local susceptibilities. So what IDSA specifically says is that if your local for quinolone resistance is not greater than 10%, then you could think about using oral ciprofloxacin levofloxacin you'd not want to use moxifloxacin because it's not going to really get into the urine. But the antibiogram I showed yet actually technically did not meet that cut off. So it was less than 90% of the isolates actually were susceptible to fluoroquinolones. If you're able to give infusions in your clinic, then subtract zone or aminoglycoside could be an alternative. Now if you're the question probably is going to come up well, what about the you know, what about intramuscular antibiotics these are both SEF Traxion and gentamicin come in I m form. Could you use? Could you use I am. So again if you're going to adhere to the letter of the law IDSA specifically says IV, I will say that SEPTA ExOne, you know the dose that you're giving, no matter what is going to be a gram. And you may be familiar with given scepter XO and let's say forgot patients with gonorrhea. But if they're less, they're more than 150 kilograms, you're probably used to give him 500 milligrams as opposed to gram. So no matter what if you were going to give I am scepter axon I would be giving a gram no matter the patient's weight. But I probably would not be comfortable with giving an aminoglycoside again, for the reason that it's weight based dosing, where you'd be giving five MCs per kg which depending on your patient's weight might equate to theoretically jabbing them with six vials of I Am, which really is not practical and you may be putting them at higher risk for toxicities. So, I will say that I have treated outpatient very mild paella with im subtraction before. But in general, you should have a very, very low threshold to send these patients to the IDI. And so if you know this is not a reliable patient, if it's a Friday, and you can't, you know, rely on getting in touch with them, if they've got any MDR O's if you know if you can't give intravenous subtract zone. Basically, if you're if you're even thinking about sending to the IDI, you probably shouldn't be sending them to the IDI. And so let's say you know, you sent them to the IDI or you were successful and giving them some upfront empiric therapy with let's say, ibsf Crack zone. You know, the nice thing about urine cultures is you tend to get them back pretty quickly. So usually by 24 hours, you'll have, you know, an organism and maybe even susceptibilities. And so, if you depending on what the organism is susceptible to, you could potentially use a fluoroquinolones to finish that treatment, you could potentially use Bactrim to finish that treatment. And you could potentially even use an oral cephalosporin or an immuno penicillin like amoxicillin if it's susceptible. Now, you'll see here that there's kind of a wide range of treatment durations here, and this is because there's been some, you know, recent studies coming out showing that shorter durations may be okay, in some cases. So if you look at the IDSA guidelines, at least for Bactrim, and or in cephalosporins, they will still say like 10 to 14 days, with their husbands some data since then that's come out showing that, you know, in some cases, if you have a patient who doesn't have kidney stones or anatomic abnormalities, and they improve very, very quickly, you might be able to get away with the shortest seven days. And our local guidelines that you have are actually for Bactrim, we say seven to 10 days and for oral cephalosporins. We say seven days. But that may not be true at other institutions. So that's why I put such a long range here. Because, you know, this is something that's a little bit newer and may not have the same consensus everywhere. And it may not apply to all patients, because if you do have some complicating factors, a kid kidney

stones, you may end up treating longer than than just seven days. Any questions before we move on to the last case?

38:11
I have a quick question. When you've got a pile on a Friday, if you're using an oral cephalosporin Do you ever use the higher dose? For whichever one you're using?

38:22
Yeah, I tend to go with, you know, the, it sort of depends on which cell cephalosporin I'm using and some degrees, you know, the, maybe the patient's volume of distribution, things like that. But I would say you know, I, you know, if I were using CAT flex, for example, cephalexin I don't know that I'd be giving a gram QID. You know, that's what I think of when I think of high dose but probably 500 milligrams, Q eight hours for paella as opposed to Q eight Q eight hours that you might sometimes get away with for other indications. But again, it sort of depends on on the circumstances of the organism and the volume of distributions and factors like that. Any other questions? Nothing in the chat. All right. So now we're seeing an 87 year old woman with a history of Alzheimer's and she's been brought in by her daughter who's concerned about poor Pio intake, more frequent falls and just more generalized somnolence than usual and she's concerned about UTI because the the her she knows that her mother's urine looks cloudy and smells smell odorous. The patient herself has kind of a poor historian but seems to be able to not know pretty consistently to symptoms of fevers, chills, flank tenderness, suprapubic tenderness or dysuria. You don't appreciate any event on exam, she does not have any sort of chronic indwelling catheter and all of her vitals look completely normal and you happen to have a white blood cell count on her and it's also are completely normal. So any thoughts about this patient?

40:14
One person suggest increasing fluids at home and sending a UA and treatment, if it reflexes I would say this is a fairly common scenario that we see. Sometimes UTI is sort of the easiest thing to kind of blame, but not not usually the problem. Yeah, and another person also suggested fluid hydration.

40:45
So, yeah, I think for this person, you know, encouraging fluids is probably the most important thing. And, you know, maybe also having this patient evaluated by, you know, if you're not a geriatrician, for example, she might benefit from that just, you know, talk about, you know, the sort of the natural history of aging and, you know, things, things to do to encourage activity and maintain quality of life, rather than kind of jumped to the low hanging fruit of saying, Okay, let's just check the urine culture and, and treat, you know, I think all of us have a natural tendency to, to want to do something, you know, to want to say, Here, take this pill, and it'll fix everything. But that may not always be the case. So I would classify this patient as most likely having asymptomatic bacteriuria, which basically means you have a positive urine culture, but the patient's not having any symptoms that localized to the urinary tract. So they're not having frequency, urgency, dysuria suprapubic, pain, flank pain, fevers. And it turns out that this is actually very common in certain patients. And I'll show you a table on the next slide. But in most

cases, treatment is not needed, and actually giving antibiotics may be more harmful than good to the patient. So this is a table borrowed from the IDSA guidelines, just showing different kinds of different populations of patients and the percentage of those patients that will have positive urine cultures at pretty much any given time. So if you look at young, healthy pre menopausal women, you know, even in that population, it may be up to 5%, who may have positive urine cultures when they're feeling totally fine when you get up to patients with risk factors, but like women with diabetes, that can be up to 27%. When you look at let's say women in long term care facility that's up to 50%. And then going all the way down to the bottom here someone who has a chronic indwelling catheter, let's say a Foley catheter or suprapubic catheter 100% of those patients are expected to have positive urine cultures at any given time. So just having a positive urine culture in the absence of any symptoms doesn't really mean much. And you may be missing something else that's going on if you you know, immediately zone in on the urine culture. So there's some important misconceptions to try to avoid here. So glad you picked up on the fact that you know, cloudy or foul smelling urine actually do not count as symptoms of UTI, they may reflect that, yeah, there's bacteria there and they may be more concentrated perhaps because that patient's dehydrated. And so encouraging them to drink more more fluids is a good idea. functional decline in the elderly does not count as a symptom of UTI. You know, unfortunately, like I said, people are, it's sometimes difficult to accept when you've seen you know, someone a loved one who has previously been very independent, inactive and you know, as they get older and age, to suddenly start to see changes in you know, in their behavior and functional status and to want to find something easy to to fix, but you know, that that's not going to fix the underlying problem, and you may end up causing more harm. You know, another common thing is for patients coming to the hospital, a lot of times people think altered mental status in the elderly equals UTI. And, you know, I think one important thing to understand is that correlation does not equal causation. You may have heard this before. But basically, delirium is something that's common in the in the elderly, which by its very definition is a waxing and waning mental status. Similarly, I just showed you that asymptomatic bacteriuria is common in the elderly. But that does not mean that one implies the other. And so an analogy I often use to teach my residents is that there is technically this is 100% True, there is a correlation between ice cream sales and drowning accidents. Does that mean that you know eating ice cream causes you to drown? Like what is the connection there? Like why is that why is there a correlation? Does anyone have any thoughts?

44:51
In the chat, oh man, a couple people.

44:55
In the summer, you know, people buy more ice cream in the summer, people go swimming more and so there's gonna be more drowning accidents. But that doesn't mean that the ice cream is causing the drowning. And so similarly, like I said, delirium is common in the elderly asymptomatic bacteria is common in the elderly. But that does not mean that the bacteria are causing the delirium. Now, if your patient has signs of, you know, sepsis, for example, and you think the altered mental status from sepsis, and the only potential source for the sepsis is urinary tract infection, and that's a totally different story. But in somebody like this patient who's just had functional decline, and more somnolence that may just be part of aging. And then

another misconception is that the urinalysis establishes the diagnosis of UTI. So, we normally recommend doing the urinalysis with reflux to culture, because if you have a patient who does not, you know, who's able to make neutrophils, so somebody who's not, you know, a chemotherapy patient with neutropenia, but has plenty of neutrophils in their body. If there's not any neutrophils in their urine, then probably they don't have a UTI. However, the reverse is not true. So if it's just because somebody has neutrophils, or white blood cells in their urine, does not actually mean that they truly have UTI. And just because you have they have nitrates, which reflects the presence of bacteria, doesn't mean that those bacteria are causing problems. And it turns out that in even in young women, some work to a third of young women may actually have some white blood cells in their urine at any given time. And when you look at elderly patients in in long term care facilities that jumps up to close to, to 90%. So, you know, again, if you don't find white blood cells, then maybe you know, you can stop there in the lab won't send the reflex to culture. But if they're having no symptoms at all, don't feel like you have to treat just because you see white blood cells in the urine. Now, what if this wasn't an 87 year old woman, let's say this is a 23 year old woman who is pregnant, and you know, you checked her urine, and it grew some some E. Coli. Would that change things at all?

47:10
Yep, so we've got some people that say, I think so, yes, you need to treat different guidelines. I would agree.

47:17
Yeah, exactly. So. So basically, pregnancy is one of two main exceptions where we treat asymptomatic bacteriuria. And the reason for this is that when pregnant women with asymptomatic bacteriuria, early detected early on in pregnancy, if they're not treated, actually have a 20 to 30 times higher risk of getting pyelonephritis during the pregnancy. And the done prospective trials given treating these patients for their asymptomatic bacteriuria, and it decreases that risk, you know, significantly down to you know, not zero, but much, much lower than that 20 to 35%. And even without pyelonephritis, asymptomatic bacteriuria has been associated with increased risk for premature delivery and low birth weight babies. And similarly, studies, you know, evidence has shown that if you treat asymptomatic bacteriuria, it does decrease that risk. And so the recommendation from IDSA is that, you know, all pregnant women should be screened for asymptomatic bacteriuria, at least once during pregnancy. And if you find it, then depending on you know, what your your organism and what antibiotic is, that should be treated for three to seven days. Now, it is recommended that if you do find asymptomatic bacteria that you end up treating at some unspecified other point during pregnancy, you should screen again, there's no consensus about, you know, whether that's a week later a month later, or towards the end of pregnancy there, you know, that's one of the problems is, you know, nobody knows exactly when and how often. And similarly, if you have a pregnant woman who you screen for asymptomatic bacteriuria, and it's negative. But, you know, do you screen them again, at some point during pregnancy? There's no real agreement on that. So, you know, we at least have a good answer for you screen early and find it, you definitely treat once but what to do afterwards, you know, it's, you know, anybody's anybody's guest. But, you know, certainly if they become symptomatic, they're, you know, you definitely want to treat

all right. And then lastly, what if instead this were a male patient who is about to undergo undergo a Terp procedure, does this change anything?

49:40
No comments in the chat yet? Okay. Well, yes, we have somebody says, Yeah,

49:45
okay. Yeah. So it kind of gives you a hint, I said that pregnancy is kind of one of two situations where we treat asymptomatic bacteria. So you can probably guess that this is the other one. So the rationale behind this is that for patient for patients I'm with asymptomatic bacteria who are about to undergo a Terp. You know, there is the risk that they're going to have bleeding during the procedure, and that any bacteria in their urine could then translocate into their blood and make them really sick. And it turns out that bacteremia actually occurs in about 60% of patients who have bacteria in the urine who are about to undergo a Turk. And up to 10% of these patients may actually develop sepsis. And so there's been pretty good trials, including even randomized control trials that show that giving antibiotics does reduce this risk of complications, including sepsis, from that transient bacteremia. This most of these trials have been limited to Terp procedures, but we kind of extrapolate and say if urology is planning for some sort of procedure, where we think the bladder is going to bleed in some way. Yeah, you should probably give them prophylaxis for that, as well. But you know, the evidence is not quite as robust. One thing that we at least agree on is that if somebody just has a, an indwelling, Foley catheter, and you're replacing it, you know, and there might be some irritation of the urethra, and maybe, you know, maybe a chance of a slight speck of blood, that's not enough to merit giving preprocedural antibiotics. But this is something where we really only recommend giving the antibiotics right at the time of the procedure. So it's not, you know, sometimes urology will request that we treat for, you know, two weeks or something to sterilize the urine. And we generally don't recommend that the risk is really for that very brief instant of bacteria in the blood. And so we recommend usually giving an antibiotic at the time of that procedure, but not really continuing that afterwards, or prescribing that in advance. So, you know, this may not come up this much in your practice. But you know, if you see a patient who says that, their urologist wants you to prescribe, you know, three weeks of antibiotics or something before the procedure that technically goes against what our guidelines would really suggest. Alright, so that's the last case. And I know we went through quite a bit in kind of a short amount of time. So some, just some takeaway points, if you remember anything is that, you know, first of all, acute uncomplicated cystitis is one of the most common reasons for antibiotics to be prescribed in the outpatient setting, and especially for you know, otherwise healthy patients without many comorbidities. And in determining, you know, the choice of empiric antibiotics, it's really this balance between the ideas of efficacy versus collateral damage. And for this reason, nitro pure Intellinet, and fosfomycin are good choices for acute cystitis because they have high efficacy, and low collateral damage. And practicing antibiotic stewardship is important not only for the patient in front of you, but also for just the general community because, you know, your practices and your colleagues practices little by little over time, can actually lead to, you know, can affect that antibiogram and can lead to selection for more resistant organisms. And patients with pyelonephritis. On the other hand, you know, these patients can be much sicker and may require inpatient admission, unless, you know, you're really confident that they check off all

those boxes that that we talked about, and you definitely do not want to use natural fear until one or fosfomycin for pillow. Because as we said, it does not really stay in the kidney at high levels. And asymptomatic bacteria is very common, usually does not require treatment with those two exceptions I mentioned including pregnancy, and urologic procedure with bleeding. And then lastly, avoiding some of the common misconceptions about UTI. So you know, namely cloudy male odorous urine, functional decline or altered mental status by itself in the elderly, positive urinalysis without symptoms, those do not make the diagnosis of UTI. So it really comes down to the symptoms that the patient is having that really localized to the urinary tract. Any questions at all?

53:56
I saw somebody briefly raise their hands. Selma, I believe it was, I'm sorry, FEMA bank. If you'd like to unmute.

54:11
Yeah, to pay I have. Hi, sorry. I didn't know how to write down the chat. So sorry. Two questions you've touched about upon them, but different. So the IBO population that I work in that has a lot of bacterial resistance. They it's a small it's a small community. And I don't know there's the I've seen crazy things in very young patients in terms of federal resistance. And I there I'm an OBGYN do I have to treat so we screen everybody with a with a urine culture in their first visit. And I see some crazy things, some crazy bugs, crazy resistance with no symptoms. A lot of times I'm inclined to repeat cultures, and not always treat them because I just feel like we're We are creating a big issue. And there is issue. Yeah, that's one question.

55:04
So I think, you know, I'd be curious why there's such high rates of resistant organisms and an otherwise healthy population.

55:11
It's a good population to study that. I can tell you.

55:15
You know, if there's any epidemiologist, you know, especially with your institution, I think that might be something they'd want to jump on. But, you know, that is, that is a good question. So if you have a pregnant woman who screens positive for any resistant organism, and you know, they're asymptomatic, and you do want to treat to prevent those complications of payload nephritis, or, you know, preterm infants, you know, are you obligated to stick a PICC line in them and put them on, you know, ertapenem or something? versus, you know, Could you could you recheck a culture and then hope that it's been replaced with a different organism? I think that's something that would be an interesting study to do. It's kind of hard to, to justify when we have guidelines and say, you know, this is what you're technically supposed to do.

56:08
We tend to do I tend not to treat and and read and read butcher. Yeah. Because because of the big problems in that same in the same venue, I have a lot me, you know, because of GBS

positive patients. A lot of people report pot, you know, allergies to penicillin, which most of the time are not true, or baby allergies, and, and my partner's using Vanko. and crazy things like that. Whereas, you know, 90 99% of time I'm using Ancef, with no reaction to the pet, you know, and it just the, the medical community just continues to increase the problem. I mean, I see, I see it every day.

56:48
So I think, you know, you raise a really great point about antibiotic allergies, and how that contributes to poor antibiotic stewardship. And that's something we've definitely taken an initiative at our institution. So it's pretty well recognized now that, you know, the majority of penicillin allergies are either erroneous to begin with, you know, someone says, Oh, yep, I can't take penicillin, because my grandma was allergic to penicillin, or, you know, maybe they had nausea or something to to augment and, or even if a penicillin allergy was real, there's pretty good evidence that about after about 10 years, the penicillin allergy goes away, and about 80% of patients. And so our allergy group has been pretty closely intertwined with us. And, you know, we've done a number of penicillin D labeling initiatives at University of Rochester. So, you know, we've done this in patients that are in the hospital, even who are admitted for something totally different, you know, pulmonary embolism and they've got we see they've got a penicillin allergy on their list, and we don't believe it's real allergy will sometimes suggest an oral amoxicillin challenge just to d label them for penicillin, but you know, when other patients including pregnant women, who might end up needing a penicillin because let's say their their group B strep colonized, our OB group has been actually sending patients to allergy for, for, for skin testing in some cases. And you know, if that means a patient can get, you know, amoxicillin or cephalosporin, as opposed to getting vancomycin with its own set of toxicities, then that's a good thing.

58:23
So I do encourage them to go actually, but in their pregnancy, I don't know if that I don't know if allergists are going to feel comfortable in pregnancy to do it. So I do encourage it. I speak to almost every patient about it, because I'm very passionate about this problem. So yeah, I'm on. I hear you.

58:40
Yeah, no. And, you know, I can understand the reluctance during pregnancy. But I'd also point out that some of the antibiotics that were stuck using for were more resistant organisms could also be not so safe in pregnancy. So Right. And, you know, we've our group, I'm sure are allergists are going to be publishing something at some point about our success in delivering medicine in women? And so maybe once that data is out there, you know, we'll see patients being more comfortable.

59:09
Can I ask one other question? Sure. A elderly man who is wheelchair bound, wears a diaper, can't really verbalize symptoms? Who gets routine urine cultures that are positive? And the PMD treats? How would you handle that? When you don't when you're not in agreement, but you also don't want to put the patient at risks.

59:36
Yeah, so I think I guess, you know, there's something coming. It's something where I probably want to bring the patient in to talk to them and also the family. I feel like in a lot of these patients, it's the family members who are kind of driving the desire to be treated and so sometimes patients get referred to see me and it's most of the visit is honestly just counseling and just trying to be more You're on what counts as true symptoms and what doesn't.

1:00:04
But they can't report symptoms. Yeah. And so,

1:00:07
you know, sometimes there can be at least B exam findings, you know, there, there are definitely patients who you press, you know, you're pressing their abdomen and they don't wince until you press on their bladder, or, you know, if they have a fever or something, no other explanation. So there can be at least be objective findings. But, you know, if it's something like, you know, altered mental status from delirium, that by definition is waxing and waning mental state. So, whether you give them an antibiotic, or you give them a placebo, that delirium may very well get better, you know, just simply with the passage of time. But if there is something that is something not like that, and there's a very clear correlation, where they, you know, they get an answer, the only one they get an antibiotic, some of these really nonspecific symptoms, do, in fact, get better. You know, I'm not going to tell them that giving antibiotic is the wrong thing to do. I think it just really depends on each individual patient. You know, so there, I don't recommend giving long term antibiotics as prophylaxis in general, because it may simply select for more resistant organisms. And maybe there are some things we sometimes suggest is you know, alternatives to that. So for for postmenopausal women with recurrent UTI, you can, you know, if there's no contraindications using topical estrogen can be something to try. There's a medication called Methamphetamine, that when you give along with vitamin C to acidify, the urine makes the bladder less hospitable place for for bacteria to live. So sometimes for these patients where the family wants to do something, you know, I can offer more than one of these non antibiotic sort of therapeutics as long as there's no contraindication to it.

1:01:58
Thanks so much, everyone. Thank you Dr. Heintz.

[End Transcript]