

UTIs, Catheters, and Incontinence

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[00:00:00] **Roberta Pesce:** Hi, good afternoon, Dr. Cabahug. Thank you for being here with us today to tell our audience a little bit more about catheters, neurologic bladder, UTIs, and management of bladder dysfunction. So, the stage is yours.

[00:00:19] **Dr. Philippines Cabahug:** Hi, hello, everyone. So, I do hope you're able to see my PowerPoint presentation. I have no disclosures, but I do have to warn everyone that some of the pictures I have may be not safe for work if anybody's at work or with kids around, and I'll be mentioning some grants, but I do not have any financial ties with these grants.

[00:00:46] All right. So, we know that the bladder has several functions. It stores urine and it releases the urine at appropriate times. It is comprised of a muscular storage. Here you can see my pointer, and a sphincter. And the control is either voluntary or involuntary. Now the bladder stores urine, and normally the sphincter is closed, and when it is time, when the bladder is full it sends signals up and down the spinal cord to the brain, it tells us that we need to empty the bladder, so the sphincter is released, it opens, and the bladder contracts, and you empty. All right.

[00:01:33] Okay, now when you have anything that affects your spinal cord it will change your bladder function, okay? It will disrupt your sensation of when you have to urinate, it will disrupt that coordination between your brain and bladder, and you may lose voluntary control of your bladder and it will change how you go to the bathroom. So, problems of bladder dysfunction, it can range from frequency and urgency, you don't know when the bladder is full, you could have incontinence of your urine or stool, or sorry, of your urine, and you would be unable to empty the bladder without the assistance of devices or medications.

[00:02:18] Now in terms of bladder dysfunction we basically classify them into two types. You have, sorry, spastic bladder. Basically, the bladder is spastic and irritable and it's not happy, and the sphincter here can be very, very tight, and it will not relax well entirely, and you would have difficulty storing and releasing urine. Now contrast that with a lower neuron bladder, or a flaccid bladder. The bladder will not contract when it becomes full, and the sphincter becomes loose, and will fail to contract, and there would be a difficulty in storing urine.

[00:03:06] I always like to give this analogy to my patients here. You think of your bladder as this nice red balloon made of smooth and very flexible and compliant muscle, and when you fill it, it should fill to a certain extent, and you should be able to empty it completely so that needs to be compliant. So, when you have your bladder program. Sorry I'm having mouse issues on top of everything else. When you're having your bladder program. Okay, let's do this this way. There are main reasons why you want to have a good bladder program. You want to prevent incontinence and accidents. You want to be able to empty your bladder at predictable times, and you want to, more importantly, maintain your health and prevent complications, and that would include having frequent urinary tract infections, a thick, inelastic bladder and kidney damage. Okay, basically what you want to have is a happy and content bladder, and happy and content bladder means that you're able to participate in things that are important to you.

[00:04:16] Now this is your normal, relaxed bladder with a closed sphincter and urine filling it. This is what I was saying about having a thick and inelastic bladder. I have to remind everyone, think of your bladder, it's not just a pouch, it is made out of muscle, and a muscle that always contracts, and it gets thicker, it's the same thing with the bladder. It contracts, it thickens. The normally smooth lining becomes all crinkly. That is not a good bladder, because as you can see there is less space for you to store the urine, and you can imagine a bladder such as this, the pressure inside that would be high, and having high pressures inside your bladder would not be good. Oops, sorry. My bad, that is the past slide. Okay. All right.

[00:05:09] Okay, now in a cystoscopy this is what you would see inside the normal bladder. Okay, it is smooth, there are blood vessels. But when you have trabeculations, or thickening of your bladder wall, that normal smooth mucosa, that normal smooth lining of your bladder, it's going to be thick, have ridges, and that is not good, because if you have mucosal tears, you have ridges inside the bladder, inside that smooth lining of your bladder, there is more space, there is more opportunities for bacteria that is not good to lodge in and try to invade and cause infections inside your bladder. Okay. All right.

[00:05:56] So, now with bladder management it would differ depending if you have a spastic or a flaccid bladder. You could try medications if it's a spastic bladder you could have medications that will help with the bladder. Now with flaccid bladder medications are typically not effective, and what we would recommend for either both, if you have a spastic bladder or a flaccid bladder, you have to make sure that your bladder is empty. If you have a spastic bladder or a flaccid bladder, you could, if you do not have that voluntary control to empty your bladder, there are many ways to empty your bladder.

[00:06:33] I'll go in with that in the next slide. So, there is the use of an external catheter or condom catheter. You could have an indwelling catheter, and there are two types of indwelling catheter. One that goes through your urethra, so this is a Foley catheter. Okay, so it goes in through the penis, goes up the urethra and stays there, it can drain it. The other one is your suprapubic tube. So, this involves a minor surgery where they form a catheterizable stoma here, so you could insert the catheter here directly. Okay, and then the next would be, I'm sorry, I misspoke earlier, a catheterizable stoma.

[00:07:21] So there are certain procedures that allow you to do intermittent catheterization through a stoma here in the abdomen. We typically see this also like in younger kids as well. It allows you to place a catheter in and to drain your bladder out. Okay, there are many different types of catheters. Mainly with the plain OPC, you see there's a balloon here. You have ones that are in a sterile kit, there are hydrophilic ones, there are even ones that are called compact catheters. They can easily, for ladies with small purses, this is a blessing.

[00:08:04] And then you also have the straight catheter or a Coude catheter. Now lately there has been the talk of an external female catheter. I do not have ties with this company, just for illustration purposes, one

of the examples of PureWick system, where you have this portion here that you can place over the labia, and this is attached to a suction machine. So basically, it's a blessing for those who are not able to get up at bed, or don't have the health care to get up and do their bladder program, allows them to sleep better at night. Before it used to be only available in hospitals, but now I think, I believe they may have it for home use, however I have to stress Medicare will not pay for this. It's quite expensive.

[00:08:56] Okay, now bladder medications. I mentioned earlier that the bladder if it always contracts it thickens. We used to give bladder medications to help calm the bladder down, and the bladder medications can act on different parts of the bladder. It can act here in the bladder muscle, and you have your typical anticholinergic such as oxybutynin. They can be selective or non-selective. You can have ones, if the problem is really with the sphincter, you could have other medications like Flomax that would help that.

[00:09:41] But the thing that I wanted to stress is with bladder medications, and they're notorious especially with the anticholinergics that you would have a lot of side effects. Can pee, can cause urinary tension, you can't see, dry eyes, you can't spit, dry mouth, and you can't fill in the blanks. You'll have constipation. Also, one of the things that has evolved in these past few years is that the increasing recognition that certain anticholinergics may have some cognitive effects, especially in the elderly. So, I keep that in mind, especially if I'm dealing with an elderly person in terms of which type of anticholinergic that I can give.

[00:10:37] There are many different types of anticholinergics or bladder medications that we can give. The relatively new kit on the block, the generic is mirabegron or Myrbetriq. It theoretically will have less of these side effects, however it is a little bit prohibitive in cost, and not all insurances will cover it, so if I'm able to have Myrbetriq for my patients either they're on that or they're on that together with the, for example, oxybutynin, I can afford to decrease the dose of the anticholinergics, so they'll have less side effects.

[00:11:17] All right, bladder Botox. It's for overactive bladder or neurogenic detrusor overactivity, so it can improve incontinence. And the nice thing about this, it helps decrease the risk of having UTIs, and it can decrease it even, I have some patients, once they get their bladder Botox, I can afford to stop their oral medications. It usually lasts around 6 months, and usually my patients can tell when they need to get their bladder Botoxed again, because they start having more spasms, and they could have a recurrence of their UTIs again.

[00:11:54] Okay, another way to manage your bladder is posterior tibial nerve stimulation. So basically, this is an in-office procedure roughly for 12 weeks. They put a needle that stimulates your posterior tibial nerve, it's one of the nerves that goes down the inner side of your leg, and the thought is that it will send impulses up to your sacral nerves, which help then modulate your reflexes involved in your bladder function. It is typically good for those with urinary. Oops, sorry. Hi, I'm back, and I am so sorry about that. My screen went to sleep for some reason. Yes, it is a day of, and I apologize. It is a day of technical challenges. As I was saying, I was talking about the posterior tibial stimulation. Okay, it can help modulate your bladder function. Okay, now with interstim neuromodulation, this is a more invasive procedure. It's good for people with urge incontinence or frequency, but I have to give caution because until a few years ago the stimulators are not MRI compatible, and if you have a type of disease that needs frequent MRIs that might be something of consideration. All right.

[00:13:38] So surgical interventions, just to briefly run through it, you could have problems, when surgery, for example you could have Mitrofanoff procedure, where they cut the part of your appendix, they attach it to your bladder, and this forms a stoma where you can catheterize. Okay, another one is bladder augmentation. They cut a part of your intestine, attach it to your bladder, and this enlarges your bladder so you can have

more space to store urine. I'm skipping over here just for the interest of time. You have urethral stints, which could keep the urethra open, and you have an artificial urinary sphincter, which keeps your sphincter closed and you activate the pump, and then for a few minutes the sphincter will open so you can drain your urine.

[00:14:31] Now for urinary tract infections, it's the most secondary health condition following a spinal corrected injury, and it is a major cause of illness. And the most prevalent risk factor is having an indwelling catheter, or even catheterizing for a long time. Okay, now one thing I wanted to bring up, and important aspect of this talk today is I wanted to talk about this paradigm shift of having a urine microbiome and thinking about it when we address treatment for urinary tract infections. The dogma before was that urine is sterile, but that is not true, urine is not sterile. Surprisingly I think of humans as a living petri dish because we really have a lot of bacteria in us. We have 10 times more bacterial cells than human cells, however it's just that they're very small compared to our human cells. Bacteria can be friend or foe, so not all bacteria are bad, and actually some bacteria play an important role in helping modulate our immune responses, and they can act as line of defense, they can inhibit the other bad bacteria from overgrowth.

[00:15:45] And one last thing, even though there are certain trends and patterns in terms of the urinary microbiome, we each have a unique microbiome, and this may probably explain why some measures to prevent UTIs may not work for all, because it really depends on what is the normal microbiome, or what's the normal makeup of bacteria in one's body. And that being said, if your urinary microbiome, if that collection of bacteria that's living in your urine, and you can have a lot of them.

[00:16:25] If you're not having recurrent or active urinary tract infections then we leave them be. They're doing their job, there's this normal balance by your microbiome. And that's one of the things we always have to think about, especially since sometimes the gut reaction is to, if you have a UTI or you think you have a UTI, or if you culture and something grows, you throw them a whole bunch of antibiotics. There is a paradigm shift on how we approach urinary tract infections now.

[00:16:56] Okay, so one of the first questions that I ask when I have a patient and I'm called to see, like he thinks he has a UTI, the first question is is it really a urinary tract infection? And this is where things might be a little bit dicey, because depending on the organization or the practice, the definition of a urinary tract infection might not be exactly the same. There will be overlaps for sure, but they might not be exactly the same. So, one concept that I would want you to remember is the concept of having colonization, or an asymptomatic bacteriuria.

[00:17:37] I mentioned earlier urine is not sterile. So, you could have a whole bunch of bacteria living happily, not making any problem, not making any fuss in your bladder. So, you would have no symptoms, and your urine may have lots of colony counts, but again, the key here is you are not having symptoms, you are not feeling ill. Okay, a lot of people, especially those who catheterize, will have colonization of bacteria, and the consensus is we do not treat it unless people have evidence of having symptoms pertaining to urinary tract infection. Now for a UTI in persons with neurogenic bladder, you could have the following symptoms.

[00:18:29] Let's talk about the symptoms first. Some would have bladder or kidney discomfort or pain in the abdomen. Some would have dysuria, they would have increased incontinence, or they're always leaking, or they leak in-between their catheterizations. Fever or chills, this is not typically common. If my patients start having fever or chills, aside from checking for a UA I look for something else. It could be something like the stool that they're passing, could be they have other infections, they could have appendicitis. Anyway, the fact is having a fever or chills especially in somebody with paralysis does not necessarily mean that they have a UTI and keep this in mind especially in this era of the pandemic.

[00:19:17] Okay, cloudy, or dark urine with odor, this is actually one of the more common things that I see my patients. They would see that there is a change in their urine, it's more foul smelling than usual, it's more cloudy than usual. I would initially have them try to drink more fluid to try to flush this out, but if it persists, definitely that's something I would consider. I would check for a urinalysis. Some people would have increased episodes of autonomic dysreflexia or would have an increase in spasticity. Or it could be something as simple as they don't feel right, they don't feel well, and then that makes me do this whole investigative process.

[00:20:06] Now for signs, when we check the urine, I mentioned earlier you will see bacteria in the urine. There would be an increase in colony counts depending on if you're doing intermittent catheterization or if you have an in-dwelling suprapubic tube or a Foley catheter. Also, one of the things that I look if there is an increased amount of WBCs, that's the white blood cells that they see in the urine. And if they have, and if this is coupled with these symptoms, then definitely yeah, you have a UTI. It's just a matter of finding out what bug is growing or not, and as I mentioned earlier, since fever, I don't typically see that in my population, I make sure I look for other things that could present with fever, other infections.

[00:20:59] Okay, now for diagnosing a UTI the most important thing, first step is to take a good urine sample. So, if you're able to urinate we usually ask you to give us a sample from your midstream. So, you urinate a little bit and then you give the sample midstream. Okay, same thing also with catheterization, if you do intermittent catheterization, you don't get the first urine that comes out, you wait for it to get to one that's technically midstream. If you have a suprapubic tube or an in-dwelling catheter, the consensus is to change the catheter first before getting a sample. Never get a sample from your urine bag, because that would be already colonized, and that would not give us an accurate account of if you have a uropathogen or not.

[00:21:53] Now some people have dipsticks at home which basically gives an idea based on chemical reactions if you have increased white blood cell count, if you have increase in nitrates, which some bacteria, like for example e. coli, you would have nitrates, but then again, I have to stress not all bacteria that can cause an infection in your bladder will have the nitrates in the urine, so be mindful of that. But the definitive thing is the urine culture. So, this is a petri dish, and you see the bacteria growing, and this will tell us what type of the cultures, what type of, and aside from helping us identify which type of bacteria, the most important thing when I have the cultures done is that what antibiotics will work on this type of bacteria.

[00:22:50] And this in part in keeping with the antibiotics stewardship that has been impressed upon us to make sure that we treat with the most appropriate antibiotic in order to avoid developing antibiotic resistance. Okay. All right, now when you treat the UTI, as I mentioned earlier, the choice of antibiotic depends on what grows, but sometimes, not sometimes, but when the patient has a UTI, meets the criteria of having a UTI, I would start them on an empiric antibiotic. Usually I would start with nitrofurantoin, but then again, once I get the cultures, I change it to the more appropriate antibiotic.

[00:23:40] So these are some of the more common antibiotics that you might have encountered if you have been having urinary tract infections. Nitrofurantoin or Macrobid, Bactrim, trimethoprim - sulfamethoxazole, cipro, amoxicillin and ampicillin. Again, the thing I like to stress is when you have a UTI, if you go to your doctor or if you go to urgent care, have them check a UA, and have them get the culture. Okay, that's important. I would discourage you calling your doctor to ask, can I get a prescription, can you call in the prescription for me. I would discourage that if you have these new onsets of UTI symptoms that are unusual, like fever for example, or just really feel ill. I think it would be better if you're able to have a visit or even a video visit so we can help iron out or tease out things. Length of treatment, so it typically depends between if you have in-dwelling Foley catheters or intermittent catheterizations, but as rule of thumb, it's typically longer than you would expect somebody without involvement of their spinal cord. Seven to 14 day treatment, and again, with

culture specific antibiotics. All right. So now is the exciting part. How do you prevent a urinary tract infection? Okay. All right, so there are different catheterization methods. The basics, basically number one, you have to make sure that your bladder is emptied regularly and completely. The type of catheterization typically with intermittent catheterization you have a lower risk of getting a UTI compared to those with the Foley catheters. Single catheter would have a decreased risk compared to reusing your catheters. Catheterization schedule, usually four to six times a day.

[00:25:56] Again, the goal is to completely empty your bladder. You want to prevent over distension of your bladder. You'd want to prevent having an over distended bladder, having mucosal tears, which would again, yeah, as I mentioned earlier in the talk, if your bladders not that smooth, if you have tears, you have this trabeculations, there's more opportunities for pathogenic bacteria to grow and invade your tissues. Ensure gentle hygiene before you change your catheter, make sure you wash the area. Adequate fluid intake and diet is important, and also important is exercise because it helps strengthen your immune system.

[00:26:40] Now prophylactic antibiotics, the strong consensus definitely is in those with in dwelling catheters, no. Why? And the next question is why. Bacteria can develop a protective biofilm, okay? Which will make your antibiotic less effective. And again, it all boils down to you're increasing the risk of developing antibiotic resistance. It is less clear in those who do intermittent catheterization, however, there's this study before comparing different studies, the incidents of symptomatic infections did not typically change. There was a decrease in asymptomatic bacteriuria. But again, antibiotic resistance was increased, and that is what we are trying to avoid.

[00:27:35] Now how do you prevent a UTI? You have to change that environment, you have to make the bladder environment inhospitable for bad bacteria, and this is especially true in those with recurring UTIs. Now with methenamine, this changes the urine environment so bacteria will not grow, and I usually use this for patients who have recurrent or frequent urinary tract infections. But again, this is not a universal treatment because it will depend on what type of microbiome that you have. Vitamin C, also I'm ambivalent to it. The theory is it acidifies the urine. If it works for you then I say go ahead and take vitamin C. All right, now the other thing also is so you make the bladder environment inhospitable for bad bacteria to grow.

[00:28:32] You also strengthen yourself. You strengthen the host, you strengthen yourself. It's important to have your yearly urologic evaluation, because if we can address causes and help decrease the risk that would help decrease the risk of getting UTIs. Now with prebiotics or probiotics there's still ongoing research. Prebiotics are specialized plant fiber that helps nourish the good bacteria, but probiotics, there's ongoing research if you instill certain good bacteria, certain species of lactobacillus into the bladder, if it will help prevent the flourishing of pathogenic bacteria such as e. coli. So more to come on that. Then blocking adhesions to the host or bladder urothelium. So, this is where some of your supplements come into, like the cranberry supplements, the D-Mannose. So, what these do, especially with cranberry it specifically blocks e. coli from attaching to your bladder. Same thing with D-Mannose, but then again, it particularly blocks e. coli.

[00:29:43] As I mentioned earlier there are different types of bacteria that can grow in your bladder and cause infection, and this is where I come back to some of these things may work for other people, but not everyone. And the last is to strengthen the immune system. There are ongoing studies right now, and this is not new, they've been studying immunobiotherapy in able bodied individuals with urinary tract infection, so basically you take an oral pill which contains some fragments of e. coli, and it gets absorbed by your intestinal system, and then it is recognized, and your body basically is, the immune system is activated. Again, more studies to come later on, so we're just waiting for if this is feasible for people with neurogenic bladder who have recurrent urinary tract infections.

[00:30:44] And the very last thing to wrap this up, I would advise you to have a yearly bladder checklist that you go over with your physicians, and this is what I do with my patients. I review their bladder management at least yearly. Is it adequate, are you emptying completely? Do we need to increase your catheterizations? Next thing I ask is are the meds working. I check your bloodwork; I check your creatinine and electrolytes yearly. In terms of imaging, at the very least I do an ultrasound every year to monitor for any stones or to monitor for any evidence of swelling of the kidneys, because that means the bladder management is not optimum, something is going wrong.

[00:31:28] I also ask the patients to consider establishing care with their urologist, especially if they don't see me regularly, because they may need a cystoscopy to check with the bladder lining, how it looks like. And people with neurogenic bladder, we do this at least once a year. For males as a part of their health maintenance I do encourage getting your regular PSA testing, because the prostate, if it's enlarged, can offer some obstruction because it can block the urethra, so that may further worsen your neurogenic bladder symptoms. And that is it. Thank you very much, and I'm ready for any questions.

[00:32:13] **Roberta Pesce:** Hi, Pines. Thank you so much for this presentation. Unfortunately, we don't have time left for questions, but we are going to encourage everyone on the stage to submit their questions and you kindly offered to reach out via e-mail to us about them, so thank you so much, and we appreciate your time. Thank you.

[00:32:26] **Dr. Philippines Cabahug:** Thank you. Have a good day, everyone.