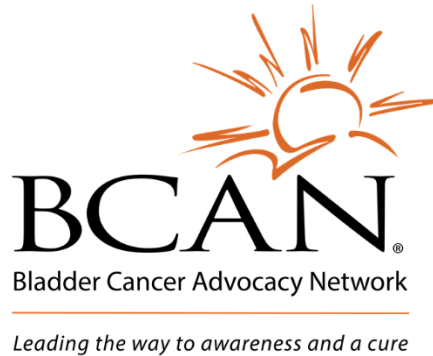


## TREATMENT TALKS

What you need to know about long term management of urinary diversions



### Managing Renal and Metabolic Complications

#### Dr. Kamal Pohar:

Thanks very much. Good evening to everyone and good afternoon. I know we're all in different time zones in the country. It's a pleasure that you're all here with us today to join the program. I also wanted to thank BCAN. It's always a privilege to be involved with any activity related to BCAN. It couldn't be a more wonderful organization for patients and even healthcare providers. I also wanted to thank Eric and Linda for being with us and we're looking forward to hearing from both of you as well.

As Dr. Schuckman pointed out, I'm going to focus on three topics. I'm going to focus on when one has a urinary diversion, what impact does that have in one's overall kidney function and are there specific alterations that can happen in your bloodstream, which medically is referred to as metabolic and nutritional changes? And urinary tract infections, that's always a common topic that everyone asks about and wonders about. Am I prone to urinary infections, and if so, what are the consequences to me? And kidney stones, or forming stones in the urinary diversion. Does that happen and why does that happen?

#### Longterm Management of Urinary Diversion

- 1) Change in renal function and metabolic and nutritional changes
- 2) Urinary tract infection
- 3) Stone formation



I'm going to get started with kidney function. It's very well known that regardless of who you are in the population, men and women, as we all age unfortunately our kidney function declines. It's a process of aging. Certainly common health conditions like high blood pressure, diabetes, certain medications we might be on, can impact our kidney function in a negative way. It's known that in the United States and worldwide, men and women over 70 years of age achieve a definition where there is some degree of kidney impairment in at least 50% of people in the population. We know again, as we age our kidney function declines and that's a fact of life.

### Dr. Kamal Pohar:

Well, what about if you have a urinary diversion? It's been an age old question that does your worsening of kidney function, is that expedited because you have a urinary diversion? Is that kidney function going to be worse? The reality is we don't really know the absolute answer to that. But the majority of medical studies that have been done in this field demonstrate that probably not. Or there might be a slight worsening of kidney function if you have a urinary diversion compared to others in the population of the same age group, same health conditions. So overall, I think kidney function is going to be stable if you have a urinary diversion, relative to others.

But one thing that's very important to recognize is that problems with a urinary diversion, like obstruction, maybe because of a stricture like Dr. Schuckman pointed out, where that ureter was sewn into the urinary diversion so that causes a blockage, that can impair kidney function. Things that I'm going to talk about; stones, urinary infections, metabolic changes, these can negatively impact our kidney function. Certainly, if you develop problems with a urinary diversion, this can harm your kidney function more so than just the process of aging. Next slide, please.

Well, what are some of these metabolic and nutritional changes that can happen? Well, a urinary diversion is made out of a piece of bowel. Whether that's the use of ileum, the colon, it's very different than the bladder we're born with. The bladder is impermeable, meaning it doesn't absorb

## Change in Renal Function

- Normal physiologic decline in renal function is expected with age
- Almost half of all adults older than 70 years are found to have an estimated glomerular filtration rate  $<60$  ml/min/1.73 m<sup>2</sup>
- Is renal function decline greater with a urinary diversion compared to age-matched controls?
- Almost 70% of patients have decline in renal function at 10 years regardless of type of diversion
- Renal function decline is exacerbated by obstruction, stones, urinary infections and metabolic changes in patients with a urinary diversion



## Metabolic and Nutritional Changes

- Ileal and colon segments: length of segment (reservoir surface area) and urine dwell time
- **Hypokalemic/hyperchloremic metabolic acidosis**
- More likely in the context of impaired renal function but has been reported in patients with normal renal function
- Usually subclinical but symptoms include lethargy, anorexia and muscle weakness
- Sodium bicarbonate, sodium or potassium citrate, nicotinic acid, chlorpromazine
- **Vitamin B12 deficiency** - varying definitions but rate generally accepted as  $<10\%$ 
  - lethargy but symptoms can include tongue swelling/neurologic problems
  - parenteral, oral and sublingual formulations



anything. When the kidneys process our bloodstream, dump the things that our body doesn't want and turns it into urine, that comes down through the bladder, the bladder doesn't reabsorb anything, it's impermeable. But obviously, bowel is the opposite. It's function in life is to absorb things. So when the kidneys process things from our bloodstream, create urine, put it down into our urinary diversion, there's a possibility and good likelihood that some of these constituents are being reabsorbed into our bloodstream.

### Dr. Kamal Pohar:

One of the consequences of this might be things that normally wouldn't be absorbed from the bladder we were born with can lead to acidosis in the bloodstream. That's a condition that can lead to certain symptoms that we might experience. It can also change our bone health, it can lead to us having some loss of mineralization of our bone. There can be some consequences.

Now, what are some of these symptoms? Well, they're vague and we often wouldn't know that this is due to acidosis in the urinary diversion. Symptoms of acidosis are "I'm feeling tired or lethargy, or my appetite isn't so good"; anorexia. Or "I just feel weak", muscle weakness. These can possibly be symptoms of acidosis. Often though, as part of your normal health exam, a blood test will demonstrate that you have signs of acidosis and usually your physician will recognize this and it's very easy to correct before you have any symptoms. Most of the time you don't have symptoms. When your healthcare provider finds that there's acidosis in the blood test, they can start you on a pill. Sodium bicarbonate is the classic pill that's used to correct this acidosis. It's very correctable. Often you won't have symptoms because it's recognized early and the problem is solved easily.

Vitamin B12 deficiency, this can happen because of the urinary diversion. When parts of the bowel are used, especially when greater amounts of bowel are used like a neobladder or an Indiana pouch, there might be a greater tendency to getting a vitamin B12 deficiency. Again, this is detected by your healthcare provider through a blood test. You can measure vitamin B12 levels. If it's detected they're low, they're easily replaceable with options by taking a pill, there are options where you can put it under your tongue, or intramuscular injection which can be given once a month. But sometimes you can get pretty severe symptoms if you have a vitamin B12 deficiency. Not only can you feel tired, but more so you can have neurological problems, some nerve disturbances, tongue swelling. Sometimes it can be very severe. Important your healthcare provider recognize it and this be corrected.

Not only can metabolic problems happen because one has a urinary diversion, but urinary infection. It's common knowledge that a piece of bowel and bacteria live in harmony. Our bowel in our body is loaded

## Metabolic and Nutritional Changes

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with bacteria. They serve a very important purpose, they live in harmony with our body. But now we've taken this piece of bowel and we've created a urinary diversion from this piece of bowel.

### Dr. Kamal Pohar:

Now it's not uncommon that we find that there will be continual bacteria present in the urine for someone with a urinary diversion. That likelihood is greater if you have an ileal conduit, when you compare it to a neobladder and even to a continent catheterizable pouch, like an Indian pouch. But it's very common to see bacteria.

But the important point is, we're always hopeful that the bacteria in a urinary diversion and our body are living in harmony with one another. That it doesn't lead to an infection. But for

whatever reason, if that bowel bacteria harmony is tipped, an infection can ensue. The bacteria can start to act up and a urinary infection can happen. That can sometimes be pretty severe. It can lead to a kidney infection, which is called a pyelonephritis, it can get in our bloodstream, all of these are quite serious and can be harmful to our kidneys and harmful to our body.

But the good news is again, there's often bacteria in our urinary systems, they don't cause an infection, they're living in harmony with our body. But some of the time the bacteria can tip the balance, we can get an infection. What's really important though, is we have to be sure that there aren't problems of the urinary diversion that have developed that are contributing to why the bacteria are there. That it's not just a fact of nature, that it's just not a fact of having a piece of bowel in our urinary system, but rather there's a problem.

What types of problems am I talking about? Well, if there are stones present in your kidneys, stones present in your urinary diversion. Bacteria love hiding in stones. That can be a focus of the bacteria. There could be staples in your urinary diversion from the surgical construction. Obstruction can happen, like that stricture that Dr. Schuckman pointed out, that blocks the kidney. Bacteria love that environment. So it's important that your doctor investigate. Not if you've had one infection or the occasional infection. But whatever draws the suspicion of your physician or healthcare provider that the number of infections or the character of the infections, or the frequency of the infections might lead to further investigation, looking for some of these findings, are they present? They're often correctable to take away that risk of urinary infections. Next slide, please.

## Urinary Tract Infection

- Chronic and persistent bacteriuria is expected with conduit (ileal) and continent catheterizable urinary diversion (CCUD)
- Mixed gram positive skin flora and not uncommon gram negative enterobacteriaceae
- Orthotopic neobladder colonized less frequently (30-80% incidence) and more common that colonization patterns change often
- Symptomatic infection rates considerably lower than rates of recorded bacteriuria and symptomatic infections more common with continent diversions
- Rule out the presence of stones, foreign bodies (i.e. staples), obstruction, residual urine, reflux
- Discuss how to investigate, surgical management of clearly identifiable causes and role for longterm low dose antibiotic prophylaxis



As I mentioned, stones can be a problem. Kidney stones are a prevalent problem in the United States. We know that during times of warmer climates in the summer months, not drinking enough fluids, especially water, other type of dietary constituents, certain factors in our diet, we're prone to getting kidney stones. Well, if you have a urinary diversion, unfortunately the rate of getting kidney stones is higher. It's up to 15% to 20% over one's lifetime and that's far higher than the average person in the United States of developing a kidney stone.

## Urinary Tract Stones

- Kidney and reservoir
- Metabolic acidosis (hypocitraturia), shorter gut (hyperoxaluria), recurrent infection (struvite), incomplete emptying of the reservoir and mucous or staples as a nidus
- 15-20% develop nephrolithiasis
- 10-15% form stones in continent reservoir
- Discuss surgical approaches to managing stones in a continent reservoir



### Dr. Kamal Pohar:

Also, you can get stones within your urinary diversion and it's much more common with a neobladder or an Indiana pouch than it is with an ileal conduit. In an ileal conduit it's very uncommon. But much more so, up to 10% to 15% in a neobladder or an Indiana pouch, you might get a stone. Why is that? It's because some of these factors I'm talking about. The acidosis, pieces of bowel have been used so that changes the constituent of your urine, urinary infections can put you at higher risk of getting kidney stones. If you're not emptying your urinary diversion well and storing a lot of urine behind. Your urinary diversion has a lot of mucus in it. These are all factors that can lead to the deposition of minerals in our urine, the formation of stones.

Once again, if stones are forming, it's important for your healthcare provider to look into factors that are correctable. Are there things that we can identify about this urinary diversion or metabolic changes, correcting acidosis, that we can improve the likelihood that further stones won't develop? Because these stones that often develop, they have to be treated surgically and we're hopeful that they don't happen.

I want to thank all of you for joining us this evening. We look forward to questions.

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