Hello and welcome to public health live. I'm Joelle Alexander and I'll be your moderator today. Before we get started, I'd like to ask you to fill out your on-line evaluation. Continuing education credits are available after you take our short post test. Your feedback is helpful in planning future programs. We encourage you to let us know what topics are of interest to you and how we can best serve your needs. We will be taking your questions later in the hour. The toll free number is 800-452-0662. Or send your written questions by fax any time during the hour. The fax number is 518-426-0696. Today's program is entitled, chronic kidney disease and diabetes, identification and intervention. Joining us is Dr. Joseph, the chief medical officer at the National Kidney Foundation. Thank you very much doctor for being with us today and this is a very important topic we will cover.

Dr. Joseph: Yes, thank you for talking about chronic kidney disease.

Moderator: Doctor, let's begin with you telling us about what the kidneys are and what they do.

Dr. Joseph: On the slide, we have the kidney diagram which shows the kidneys, which are two, bean-shaped organs located in the flanks. They are served by the aorta, the major blood vessel in the body, they are efficient filters. They filter the blood, drain the blood through two tubes into the bladder and expel through the urethra. The kidneys receive a generous amount of blood supply that allows them to perform filtration. They are amazing organs. They filter the blood and waste that buildup from the metabolic products that we develop when we eat protein. They move fluids from our bodies that we eat and drink. And they also involve maintenance of blood pressure of, red blood cells and bone health.

Moderator: What is chronic kidney disease?

Dr. Joseph: Chronic kidney disease is damage of the damage. Or loss of kidney function that is present for more than three months. This is tested with two primary tests, a test of the urine and the test of the blood, which is called estimated filtration rate. If those are abnormal for more than three months, that's a sign of chronic kidney disease and it makes sense that patients with chronic kidney disease, especially when it's advanced, have problems with blood pressure, problems with bone health, problems with anemia and other complications.

Moderator: What is the relationship between diabetes and kidney disease?

Dr. Joseph: Well, these two diseases are interlinked. Diabetes is the most common cause of kidney disease and kidney disease in diabetes is unfortunately under recognized. Patients are not aware that they have kidney disease. The use of the tests that I just described is low. Outcomes of kidney disease include loss of kidney function over time, complications, kidney failure, which requires treatment with dialysis or transplantation, and death. The good news is that early detection allows more time for interventions to prevent or delay complications and slow loss of kidney function. What we'll focus on today is the intervention primarily being blood pressure control and glucose control for diabetics. So that is risk factor control is the primary intervention for patients with chronic kidney disease.
Moderator: Dr., is there a typical case that illustrates the experience of a patient preventing diabetes-related kidney disease?

Dr. Joseph: Thank you for asking that. Fortunately patients often present late and the we have a vignette here of a 42-year-old gentleman, African-American, obese man, who presented to the hospital for treatment of a skin infection. He had long history of diabetes, which was treated with insulin and complicated by a number of problems, including neuropathies, retinopathy and high blood pressure. He had bone on bone phenomena, that was followed by orthopedic specialist and he received specialized treatments to his eyes, called laser therapy, for diabetic retinopathy or eye disease. The his physical exam revealed a blood pressure of 152 over 92. That is elevated. His heart and lung examinations were normal. He had ankle as welling on both sides and there were signs of skin infection on the left fleeing what are the tests to identify kidney disease?

Moderator: What are the tests of kidney disease?

Dr. Joseph: The two primary tests are the tests of kidney damage, urinary test, and the test of kidney function. In this patient, the urinary ratio was greater than 300 milligrams per gram. A level of more than 30 is abnormal. The serum blood test was 6.2 and the estimated glomerular filtration rate, that's in millimeters. It doesn't exactly role off the tongue, but that is basically a percentage. You can conceptualize that as a percentage of kidney function. This patient has a very low-level of kidney function. Advanced kidney disease phase 5, the most advanced 5 stages of kidney disease. Unfortunately this patient presents with advanced chronic kidney disease.

Moderator: There are progressive stages, one being the lowest and 5 being the most advanced of kidney disease?

Dr. Joseph: Yes.

Moderator: We have someone with advanced stage chronic kidney disease that we pointed out. How could it go undetected for such an extended period of time?

Dr. Joseph: There are a number of factors that contribute to that. Patients are not aware of kidney disease. Awareness is low. Most patients feel well. On the physician's side, kidney disguise really just in the past since going by 2002 has a unified diagnosis. We have some on time and perhaps a learning curve we could say in terms of implementing the tests for chronic kidney disease and early intervention and from a system approach, the health care systems are getting involve in quality improvement efforts to improve chronic kidney disease. I think this is going to improve in the future and fortunately we'll have fewer cases that present as late as this patient did.

Moderator: You sound optimistic.

Dr. Joseph: Yes.
>> Moderator: So early detection really is the key?

>> Dr. Joseph: Yes.

>> Moderator: What are the next steps for this patient that you have given us this example of someone with chronic kidney disease that it has gone undetected for an extensive period of time?

>> Dr. Joseph: Even when the patient presents late, there it is still hope and treatment. But this patient is going to be faced with some challenges. To prepare for dialysis, a patient needs to be counseled about the different types of dialysis, which can be in the center or clinic or at home or kidney transplantation. The patient is faced with a lot of information to digest in a short period of time. What I want to emphasize is there is a better way. Early detection allows more time for intervention to slow loss of kidney function and delay or prevent complications and the intervention we'll focus on is risk factor control, blood pressure control and diabetes control.

>> Moderator: Is it fair to say that if someone received early detection that they would potentially avoid being placed on dialysis later or is that not true?

>> Dr. Joseph: There is a chance that the patient would never need dialysis and also an opportunity to prevent complications or if not prevent dialysis, slow the need for dialysis. So perhaps instead of a 7-year course, more like an 11-year course or 13-year course. Give the patient more time.

>> Moderator: Dr., what I’m wondering is why is implementation so low?

>> Dr. Joseph: Because kidney disease really just developed in unified diagnosis in 2002, I think it will take a little time for this to be implemented. I think the other thing that we'll talk about a little bit is the public's perception of kidney disease is low and kind of negative. And I think that with time, we can be hopeful and things like we are doing here today, I think will help to promote early detection and intervention.

>> Moderator: You know, I think it would be helpful for us to start out with the vignette because it really brings to home what chronic kidney disease is. Why is it such an important topic as it relates to public health?

>> Dr. Joseph: This slide shows a recent paper from the centers for disease control that really highlighted some of the 4 key components of chronic kidney disease as a public health problem. One, the burden high and we'll show that on subsequent slides. Millions have chronic kidney disease and unfortunately they suffer poor outcomes. The burden is unfairly activity butted. I'll show one slide about that that shores kidney failure. Up stream could reduce the burden of kidney disease and preventive strategies are not yet in place unfortunately like the case we discussed late detection and late treatment are common today.

>> Moderator: What are the public perceptions of kidney disease?
Dr. Joseph: I think in general the awareness is low and perceptions are negative. And if you ask patients or people in the general public what they think of when they think of kidney disease, I think they would probably tell you they think of dialysis or transplantation. I think they think it's very grim as well. This dates back to, this is a picture here from life magazine in 1962. This is the death committee they decide who had lived and who died. This is before we had Medicare coverage for kidney failure. I think this historically is part of the negative perceptions that patients have of kidney disease. I think what I would want patients to understand is that kidney disease is the spectrum of disease. It's a whole range of disease that includes earlier stage of disease. Dialysis and transplantation are treatments for kidney disease. Most patients with kidney disease have earlier stages. And with early detection and intervention, risk factor control, blood pressure, and glucose control, we can offer patients the opportunity to slow loss of kidney function and delay or prevent complications.

Moderator: You indicated earlier, that those with the earlier stages of kidney disease will not have demonstrable symptoms. Is that correct?

Dr. Joseph: Yes. Unfortunately, most patients with chronic kidney disease feel well. And only when the kidneys fail or when they are close to failing, is when patients have complications or symptoms. And those symptoms usually are things like ankle swelling from the fluid retention, symptoms from the waist buildup like difficulty concentrating, fatigue. Those are not also symptoms that patients will generally ascribe to the kidneys. They think it is something else. Even when the symptoms develop it's not clearly related to the kidneys in terms of what patients perceive that. Emphasizes that patients with diabetes and high blood pressure should partner with their doctors for testing even when they feel well.

Moderator: Doctor, there are a lot of terms that are used when we talk about kidney disease and failure. How did the term come about?

Dr. Joseph: You say tomato I say tomato. We had a lot of these terms. We had prerenal failure, predialysis, which doesn't sound hopeful. So chronic kidney disease is a tune form term. The word kidney comes from Middle English patients. And it avoids the semantics. These different terms I just described as well as it leads to kidney failure, which requires treatment with dialysis and transplantation. So that progression to kidney failure makes more sense for patients.

Moderator: Specifically, when we talk about chronic kidney disease, why is that so often missed?

Dr. Joseph: So I think there are 3 reasons for this. One is the patient level, one is physician level and one is system level. I think the kind of things we are trying to do today to improve early detection and intervention can really help. This slide is, you can't find what you're looking for. We need to improve patient protection. The way to do this is with the two tests. The estimated filtration rate, the test of kidney function and the kidney damage test, urinary test.

Moderator: Early detection, early depiction, early detection. We have some footage to share with you of a special screening event for kidney disease. Let's take a look.
Van Brooks doesn't know a lot about kidney disease. Volunteers for the national kidney foundation stopped by his apartment building today and convinced him to be screened. Dan got his weight and the blood pressure checked then his blood and urine tested at the free Screening. Doctors were checking for indicators that he might have kidney disease. By getting tested, he is participating in a nation-wide study called, cherish.

Everyone’s kidney function goes down with age a little bit. For this program we are screening anyone who is 15 years of age or older.

Early detection of kidney damage from high blood pressure or diabetes allows us to institute treatment really early in a hope that we can stabilize the kidney function and keep it from getting worse to the point they would need dialysis.

The cherish study is focusing on early detection and edges about -- education about chronic Kidney disease. Everyone who participates will be invited back next year to check on their progress. We all have two kidneys. About the size of a fist and they are near your rib cage. They do a lot for your body, remove toxins, help control your blood pressure and excrete urine. You won't have any signs or symptoms with kidney disease. So the only way you will know is through testing.

30% of central New York residents were found to be at risk. Mimi is a volunteer for the national kidney foundation. 4 years ago, doctors found a protein in her urine that is a sign of kidney disease.

I would have never known. They say it's a silent killer and it's just a lot out there that might have this and don't know it.

Today, Mimi is taking medication for high blood pressure and the protein is gone. If the disease is caught early, things can be done to stop its progression.

Once someone has end-stage kidney disease, there is no way their kidneys will ever work again.

Moderator: So again, we see in this screening event, that it's very critical to have, your kidneys screened and detected. What I found interesting is 70% of those screened in this event were found to have some risk of potential kidney disease. How common is that?

Dr. Joseph: Well, the risk factors for kidney disease and a screening program will be higher because it targets the risk conditions. The diabetes risk conditions in the U.S. Population is probably about 20 million individuals. High blood pressure is more in the range of 65 million or more individuals. So, it's many millions of individuals are at risk for chronic kidney disease. Just in the diabetes and high blood pressure risk conditions.
Dr. Joseph: the national kidney foundation has a early program called KEEP, that conducts these type of screenings across the united states and this is to help promote awareness in the risk conditions of diabetes and high blood pressure and awareness of kidney disease. The footage we saw was from a CDC program and the chronic disease research group to screen patients for chronic kidney disease in 4 states and one of which is New York. And that is part of screening project that the CDC is undergoing. CDC has a surveillance program to develop a registry for chronic kidney disease in the United States as well.

>> Moderator: What do physicians need to look for specifically?

>> Dr. Joseph: So, the next slide shows the two tests which we talked about a bit already. The first test is a structural or functional abnormality of the kidney for more than 3 months when is generally a urinary ratio more than 30 milligrams per gram. That can be done on a specimen in any routine clinic visit. The other is the estimated filtration rate, the test of kidney function. Less than 60 mL liters per minute, like I said is more or less a percent. With or without kidney damage, those two tests for more than 3 months are the definition of chronic kidney disease. You can say more than 60 is safe for filtration rate.

>> Moderator: Are these tests invasive? In addition to that, are they cost prohibitive?

>> Dr. Joseph: The tests can be done in a routine office visit. A urine specimen can be collected, which can be a very small amount of urine can be used to determine the urinary ratio. The blood test, so with any kind of blood draw. It's relatively painless for patients and noninvasive. Just a blood draw is all that is involved. The cost is a few dollars. The urinary ratio test is probably on the order of 3 dollars. And the test for estimated glf costs approximately 10 dollars.

>> Moderator: Are the tests routinely given during an annual itself call exam or would a patient have to advocate on behalf of themselves based on family history if there is a history or kidney failure?

>> Dr. Joseph: We want all patients with diabetes to be screened like this and that's what the national kidney foundation recommends, the American diabetes association recommends and generally annual testing is recommended. If you have high blood pressure, you need to be tested with those two tests. Other risk conditions are a whole list but age over 60 and cardiovascular disease are probably other good risk conditions for people to know. But diabetes and high blood pressure are the most common risk conditions that people should be tested.

>> Moderator: And we talked about in the early stages how the symptoms are somewhat in distinguishable in comparison to, for example, chronic fatigue or some other symptoms that may not – a patient may not typically associate with having kidney disease, whether it's early stages or leading to the more advanced stages. What should a patient look for?

>> Dr. Joseph: I think that the patient should realize that it's not the symptoms. Because they generally will feel well with early stage kidney disease. What they should know is the risk conditions. Patients should be aware of the risk conditions. Am I at risk? That's what we should be asking. Are you at risk? And the risk conditions would be diabetes and high blood pressure
primarily. If I have diabetes, then part of the care of my diabetes is to be tested to partner with my physician just like I’m getting my urinary albumin ratio and estimated gfr once a year. I should be getting things like the hemoglobin a1c, test of glucose control, my blood pressure tested and I should be getting my lipids tested. My eye examination, my foot examination. All of the routine tests for diabetes complications, kidney disease testing should be incorporated into those. Patients should know that part of diabetes care is testing for kidney disease. And part of the motivation to control their diabetes and to control their blood pressure should be to avoid the development of kidney disease or if they have kidney disease already, to help slow the progression or to prevent the complications.

>> Moderator: So really focusing on those risk factors. If you have a patient who is generally well, and not show can or exhibiting any type of symptoms, but again there is a family history, would this person, would that be considered a risk factor having the family history?

>> Dr. Joseph: Yes. Thank you for asking that. Some patients don't been their family history so I don't always emphasize that. It's important if you don't have diabetes or high blood pressure, if you have a family history of kidney failure, someone being treated with dialysis or a family history of chronic kidney disease, you should be tested as well. And you should be tested for the risk conditions, probably you're at increased risk for developing the conditions, diabetes and high blood pressure.

>> Moderator: Doctor, can you describe the gfr a little bit more?

>> Dr. Joseph: The estimated glomerular filtration rate is based on the kidney function that is based on the serum blood test. It's basically a calculation of the serum creatinine that factors in the patient's age, the patient's race and gender and it results in this number that is medical a percentage of kidney function. It's something that is easier for patients to comprehend because it's directly related to the ability of the kidneys to filter. And that's why we use the estimated gfr instead of the blood test, which is a little bit different if inversely related to kidney function. It's not a direct relationship for patients to understand.

>> Moderator: In the venue we started off with in describing the patient who had already reached stage 5 of having kidney failure, what about patients exhibiting other characteristics for symptoms? Take us through the other stages of chronic kidney failure. Or disease. On.

>> Dr. Joseph: On this slide we have the 5 stages and on the second column we have description, which as we go down is kidney damage with normal estimated filtration rate. Kidney damage with mild decreases in estimated filtration rate. And then in stage 3, we have moderate, decreasing filtration rate. Severe at stage 4. And then stage 5 is kidney failure which usually requires dialysis or transplantation. And then the stage of two is greater than 60. So if those patients have an estimated gfr greater than 60, they don't have kidney disease unless they have a marker of kidney damage like an abnormal ratio. The patients in the stage 3, have a gfr to between 30th though less than 60. The patients with stage 4 disease, have a estimated gfr between 15 and less than 30. And patients with stage 5 have an estimated gfr less than 15. And we can see in the last column, the prevalence in millions. As we go down, the first 4 stage systems based on federal data from the national health and nutrition examination survey that the
recent data from 1999 to 2004 shows a total of 3.6, 6.5 and 15.5 million people in each of the 3 first stages. And less than 700,000 in stage 4. In stage 4, chronic kidney disease patients treated with dialysis and transplantation, we have a registry called the United States renal beta system. It shows half million patients with that level of kidney disease. So in all, this is 26 million American adults with one of the first 5 stages of disease. A huge number of people out there. Unfortunately, most of are not aware they have it. Early intervention is something early detection and intervention is what we need to promote to help patients recognize they have chronic kidney disease and improve outcome. So with increased public awareness, early detection, and intervention, those stages or those numbers exhibited in stages, let's say 4-5, hopefully will decrease over time.

>>Moderator: So we are hoping to decrease that?

>>Dr. Joseph: We hope to decrease it. Two things are happening in the U.S. population now. We are aging and unfortunately we have an obesity problem and as we age, we tend to have higher rates of diabetes, type 2 diabetes and high blood pressure. And as we get fatter, we have higher rates of high blood pressure and type 2 diabetes. Both are the primary risk factor for kidney disease. So the aging and obesity epidemic will promote kidney disease through diabetes and high blood pressure. So, I think those are societal changes to address the obesity epidemic.

>>Moderator: What are the causes of kidney failure?

>>Dr. Joseph: So the causes of kidney failure are shone in the slide on this pie chart. And the most common cause in blue is diabetes which made up 37% of the cases of kidney failure in the year shown, which was data that is a few years old now. The patients with high blood pressure encompass about 24% of individuals with kidney failure this. Is the cause of kidney failure. In summary, about two-thirds of patients have either diabetes or high blood pressure. As the cause. It makes up smaller populations.

>> Moderator: Is kidney failure always second to another condition?

>> Dr. Joseph: The systematic diseases like diabetes and high blood pressure are the secondary causes of kidney disease. Diseases like nephritis, or kidney disease, are primarily kidney disorders. Those are generally less sis systematic. So it may or may not be secondary to a systemic disease.

>> Moderator: Thank you. We talked about the relationship between diabetes and kidney failure and those struggling with both are encouraged to participate in self management programs. Let's take a look at such a program.

*VIDEO*

>>Many people struggle with chronic kidney disease as a result of diabetes. Self management programs teach individuals how to cope with chronic conditions.
Because it's very nerve racking to be the support person and see somebody going through this and then stress. Stress we think of that as being bad. We think stress is a bad thing. So collection agency calls or something bad happened. Stress can be a good thing. There could be good things happening in your life that cause a tremendous amount of stress. Marriage, grandchildren, children being born, moving, retiring, changing jobs, even working in the same facility, changing your position.

Self management is an integral part of maintaining the normal lifestyle while coping with chronic conditions.

Moderator: So programs such as this self management program, are they common or are they offered pretty much throughout the United States?

Dr. Joseph: I think it will be better if they were offered more uniformly. I think there is a recognition that self management is important part of care and that there is a big movement to improve self management and particularly in chronic care. It's really empowering the patient to allow the patient to become more active participants in their care.

Moderator: How do cardiovascular disease, kidney disease, and diabetes interact?

Dr. Joseph: Well, they interact in a very close way. And this slide shows the interrelationship between high blood pressure, diabetes and chronic kidney disease. This is to emphasize that chronic kidney disease is part of the care of the patient with diabetes and part of the care of the patient with high blood pressure. So that if a patient has high blood pressure, they should know that managing their blood pressure is important to prevent heart attack and stroke. But also it's important to help prevent kidney disease and testing for kidney disease should be part of the care of the patient with high blood pressure. The same goes for patients with diabetes. Part of their care should include the glucose control, the screening for other complications, and the screening for chronic kidney disease.

Moderator: Thank you. Why is chronic kidney disease such concern according to the national kidney foundation?

What makes kidney disease different? How is the patient with kidney disease and diabetes different from the patient who has diabetes and no kidney disease? Cardiovascular disease is the Number 1 killer. And chronic kidney disease multiplies the cardiovascular disease risk. For every risk like diabetes and high blood pressure, clinicians must test for chronic kidney disease. The reason for that is the patients are sicker. Risk factor levels are higher. Control is worse and treatment is worse. And more complex. Outcomes are worse and costs are higher. And on the next few slides, I’ll go through some of these 3 components. The management is different with ckd and we have treatments available and effective today. The treatments that we are talking about today are better blood pressure control, particularly with kidney protective medicines and receptor blockers and ace inhibitors and better glucose control and that's risk factor control in short.
>> Moderator: You emphasized earlier the significance of patients of really honing in on risk related factors. Can you take us through the risk factors a bit more?

>> Dr. Joseph: So this is a slide that shows the relationship between chronic kidney disease and risk factor levels. The prevalence of albumin in the urine is shown by the height of the bars and the numbers, zero-5 are the cardiometabolic syndrome components. And as we go from no cardiometabolic syndrome risk components up to 5, we have a step wise increase in the level of chronic kidney disease or prevalence of albumin in the urine. So kidney disease patients have higher cardiovascular -- this is one evidence that kidney disease patients have higher cardiometabolic risks.

>> Moderator: How does blood pressure factor into kidney disease?

>> Dr. Joseph: Well, the treatment is more complex and more difficult. And the kidney early evaluation program that I mentioned before, and the federal program, this data here, shows the key data in purple and the enhance data in green. And in short, the message this shows is that patients who don't have kidney disease have better blood pressure control than patients who do have kidney disease. So we can see the percent reaching target blood pressure is the height of these bars. And in the patients with kidney disease stage 1, 2, 3 and 4 and 5 combined on the horizontal axis, all have lower percentages of patients reaching the target blood pressure. Compared to patients without kidney disease and you can see both of these populations, national populations, we have this blood pressure control being worse in patients with kidney disease.

>> Moderator: Doctor, you have an interesting analogy that you use related to chronic kidney disease. Can you share that with us today?

>> Dr. Joseph: I think everybody has an iceberg slide. What we see is the tip of the iceberg and that is like the case we presented today. The patient presented late and had ankle swelling already and had advanced kidney disease. So we see the dialysis and transplantation. If you look along the right side of this iceberg, we might start with albumin in the urine as the earliest sign of kidney disease in a patient with diabetes. Then as it progresses to getting closer to the surface, we see loss of kidney function or lost of estimated filtration rate and then as the kidneys fail, the need for transplantation. We want to try to diagnose people when they are at the earlier stages. Not when they are under water but at the earlier stages. On the left side, we have the different view of this and that's the cardiovascular view. We can detect albumin in the urine early but then we have heart abnormalities like thickening of the heart muscle and that can lead to cardiovascular death. That's one of the recent recognitions that this can lead to kidney failure and cardiovascular death.

>> Moderator: What is the relationship between estimated gfr and albumin?

>> Dr. Joseph: So these are two tests and this slide shows a relationship between cardiovascular death and these tests showing these tests both contribute to the cardiovascular death together. So this is a 3 dimensional curve. The height of this is the level of annual rate of cardiovascular mortality. And we see in the yellow bars, that's patients with normal albumin in the urine. In the green bars, those are patients with micro-albumin in the urine and the brown bars -- increasing
levels of albumin going from yellow to green to brown. You can see that the mortality increases as we go across. So patients with higher levels of albumin in the urine have higher levels of cardiovascular mortality. Similarly if we look on the other side where it says estimated filtration rate, horizontally, we see it as the kidney function decreases and we also have higher levels of cardiovascular mortality. Lower levels of kidney function and higher levels of albumin are associated with increased rates of cardiovascular mortality. Stages 1-5, how do they relate to outcome?

>> Dr. Joseph: So, because this chronic kidney disease definition just came out in 2002, we are just starting to see data that shows in one study in a 4-year period, over 14,000 patients were followed. Patients who didn't have kidney disease are shown on the left. Patients with stage two and stage 3 and stage 4 are shown to the right. And we see the percent who received treatment with dialysis transplantation. That is in black. And the percent who died, that is in red. So we see that in early stages of kidney disease, stage 2 and stage 3, about 20% and 24% of the patients died and only about 1% progressed to kidney failure. Whereas if we look at stage 4, over a 4-year period, 46% died and 20% went on to kidney failure. So we can see that death looks like it's a more common outcome than kidney failure in patients with chronic kidney disease, particularly in earlier stages. And that early intervention and early treatment of risk factors should help slow the progression ever kidney disease and should help reduce the cardiovascular Mortality.

>> Moderator: Doctor, are there racial and ethnic disparities when we take a look at chronic kidney disease?

>>Dr. Joseph: Yes, unfortunately there are many health disparities in kidney disease and I’ll just show you one. And that is in the incidents of kidney failure. So on the left, we have the count, a total number of patients, and you can see there are many more Caucasian and white patients in blue than other races just because they make up more of the total population. If we look on the right panel, we see the rate per million population. And we see that the white patients have a rate of about 200 per million population. Whereas the African-Americans shown in orange have a rate of about 1,000 per million population. So that rate is more than 4 times higher for African-Americans than for Caucasians.

>> Moderator: What are the costs of chronic kidney disease?

>> Dr. Joseph: So chronic kidney disease is a disease and cost multiplier. And in short, we have a diagram here which shows you the prevalence of the disease on the left and the costs on the right. So the presence of people with disease is shown on the left circles and the costs are shown on the right circles. And in some, kidney disease made up 8.7% of the Medicare population. Yet they consume 24.5% of the expenditures in 2006. That is 50 billion dollars. So ck does. Air disease and a cost multiplier. This doesn't include costs of dialysis and transplantation which are more like 20 plus billion so the total cost for kidney disease are more like 70 billion. More than 70 billion dollars in 2005. Or 2006. The most recent data we have.

>>Moderator: What is the prognosis for those with chronic kidney disease?
Dr. Joseph: Early intervention should allow more time for the risk factor control blood pressure and diabetes control. And it will depend on the level of kidney function when the patient presents and also on the level of albumin protein in the urine when the patient presents.

Moderator: I understand that a clinical action plan has been developed. Can you discuss that with us in detail?

Dr. Joseph: Sure. This was developed by the national kidney foundation available on their website www.kidney.org and this is a summary of it. It shows you the stages across in the columns and the intervention in the first column, so stages 1 and 2, we have risk factor control that I mentioned, blood pressure control, less than 130 over 80. Particularly with kidney protective medicines, ace inhibitors and the receptor blockers. Glycemic control generally hemoglobin a1c target less than 7%. Cardiovascular reduction includes lipid management, cholesterol management and tobacco cessation, avoidance of anti-inflammatory drugs, medications like ibuprofen and particularly at later stages, avoiding contrasts which may progress or cause progression or loss of kidney function. These are agent that are given with x-rays based on iodine. And as we go from stage 1 to 3, we want to control the risk factors and then we start to see complications like anemia, malnutrition, and renal bone disease. As we go to stage 4, patients should be seen by nephrologists in general. And the patients should be prepared for dialysis and transplantation. Patients with stage 5 kidney disease on the far right, in general, should be treated with dialysis and transplantation. So this is the accumulative additive intervention based approach to patients with chronic kidney disease that is based on the stage of disease.

Moderator: Would you summarize for us the vignette of someone, the African-American naturally we talked about earlier without early screening?

Dr. Joseph: This is a 42-year-old gentleman with stage 5 chronic kidney disease. The filtration rate was 13. He had many years of diabetes and his course was likely over many years. So there are many missed students diagnose and treat a chronic kidney disease -- he is now faced with transplantation. There is a better way. Earlier identification and intervention. The earlier identification should allow more time for interventions to prevent delay of complications and slow loss of kidney function.

Moderator: When we talk about the guidelines for vaccinating a patient with kidney disease, what should we be looking for? What are physicians looking for when it comes to that?

Dr. Joseph: So it's a good time to talk about this. Upon it's a fall. It's flu season in the united states. It usually goes from October through May. And the most common month for the flu is February. Patients with chronic kidney disease should be vaccinated with the influenza vaccine. The flu shot. Major indications to it is egg allergy. So patients with chronic kidney disease should be offered the flu vaccine and should this is a great time to do it. This comes from the
centers for disease control shown on the previous slide and the summary of the recommendations which we don't have time to go through now are shown on this slide.

>>Moderator: You emphasized for us very clearly and in such a comprehensive nature the importance of early detection and early intervention. What are the rates of success for someone who has received early detection and ultimately early intervention?

>>Dr. Joseph: Well, honestly, we are starting to find that out because there are studies ongoing and I'll show you some data. You about the concept is the slope or the loss of kidney function or time will be decreased if we identify kidney disease early and intervene early. This concept slide shows you the no treatment in gray where we have a progression, loss of kidney function shown on the vertical access to the development of kidney failure shown in green over a 7-year period. With current treatment in red, we might see a delay of the need for kidney failure two years to 9 years. And this again is a concept sleight slide with earlier treatment we might see two extra years. So, this is not -- can everybody expect a 2-year benefit? No this is a concept that we think that there will be delayed progression, loss of kidney function, with early identification and treatment.

>> Moderator: Thank you. We have a call for the doctor coming from Rochester. Hello.

>> Hello. My name is Willie May. And my question is, what are the symptoms for early stages of kidney disease? I know there are no symptoms. What are the symptoms for maybe the later stages of kidney disease?

>> Moderator: That will thank you.

>> Dr. Joseph: So the question is, because there are no symptoms of early kidney disease, what are the symptoms of late kidney disease. So there are a variety of symptoms. One is fluid retention. So that would occur with ankle swelling. Another would be fluid retention around the eyes, particularly under the eyes. And particularly a sign of patients with heavy protein in the urine. There may be foamy urine that occurs in patients who have protein in the urine, especially if it's a lot of foam in the urine. Another symptom is difficulty concentrating, difficulty making change at the market. Difficulty sleeping. Difficulty with appetite, early morning nausea and vomiting. Those are some of the symptoms of kidney disease that are based on wastes that develop in our bodies when our kidneys don't function. But again, these are symptoms that unfortunately occur in general, very rate in patients with chronic kidney disease and we wouldn't want a patient to wait until those symptoms develop. We want the patients with diabetes to be tested early before those symptoms develop.

>>Moderator: Thank you and thank you for your call from Rochester for the doctor. Could you provide us with a summary of the variety of studies that have been done and conducted on chronic kidney disease?

>> Dr. Joseph: Thank you for asking that. I showed you a concept slide. So does that concept play out in the real world is that we have some data based on blood pressure and this is a number of studies. One shows untreated patients in the red. And as we look horizontally, we see the
level of blood pressure, the systolic blood pressure going from 130 to 180. We have the level of
kidney function, loss of kidney function over time. Negative numbers because in general we
lose kidney function over time. You can see the red line shows the rapid loss of kidney function
culminating with the red dot, untreated high blood pressure. And we see a slower loss of kidney
function in the treatment trials of patients in the orange. And those trials include many studies
that were conducted in patients with diabetes including the idnt trial, abcd trial and others.

>> Moderator: We spoke earlier about the connection of chronic kidney disease and the public
health agenda. How important is it for the national kidney foundation to partner with, for
example, like CDC, to get the message out and to raise public awareness?

>> Dr. Joseph: There is so much to be done. There is 26 million people to be reached. There are
physicians to be reached. And there are public health workers to be reached. And the more we
can do together to compliment our efforts, the better. It's exciting to work with the CDC because
they have a lot of influence with the state and county health departments and I think at the state
and county health department level, partnering with whatever activities are going on in diabetes
are important. Partnering with your state as a chronic task force would be important. If your
state is one of 10 states like New York State that has a quality improvement organization, which
is working on improving the care of patients with chronic kidney disease, should you partner
with your quality improvement organization.

>> How do you assist the status of an elderly patient with chronic kidney disease?

>> So one of the things that happens over time is that we lose kidney function as we age.
Particularly after about age 40-50, we start to lose kidney function. And there has been a lot of
discussion about this. But essentially patients who were elderly have a more, likely to have
problems with medications because most medicines are excreted by the kidney or liver. So
particularly the kidney excreted medications may be problematic. The patients may have kidney
Disease. They should be tested for kidney disease. I think the key is whether or not the patients
have albumin in the urine. Is this just a loss of kidney function over time that is related to age?
Or is this the disease with albumin in the urine that would imply other interventions like
treatment with the kidney protective medicine, ace inhibitors and receptor blockers? If it's loss
of kidney function over time without the kidney damage, then the only intervention may be care
in the use of certain medications, or avoiding certain medications which are toxic or excreted by
the kidneys.

>> Moderator: So the slow progression of kidney disease is inevitable? Is that what you're
saying?

>> Dr. Joseph: Well, as we age, we do lose kidney function over time. I think there is a little bit
of controversy here honestly in terms of what, or where do we define aging, the normal aging
process and disease. I know there is -- where do those conditions meet? That needs to be
worked out in the future with improved understanding of the kidney function changes over age
and refinement of the estimated gfr equation, tests in elderly populations particularly at that level
around 60 where it's or where the value is so crucial to diagnose kidney disease.
Moderator: Where can our viewers find more information about KEEP?

Dr. Joseph: www.kidney.org and that has a keep website, with a lot of information bell keep, including where kidney disease screening is in your area. If you put in your zip code, you can find information, published articles about the program, journal descriptions of the keep program there as well.

Moderator: We are seeing alarming increases in the rates of obesity in young people. Particularly children. As such, is there an assessment or kidney disease among youth and children?

Dr. Joseph: There is a national institutes of health study now called c kid, chronic kidney disease in children, studying best how to test children for chronic kidney disease. So, the data will come out soon. But it is disturbing that our obesity epidemic is hitting or affecting children and I think this is a societal problem that healthy eating and exercise needs to be more a part of our lifestyle and incorporating that into our schools and community will be the key to addressing that.

Moderator: Thank you. We have a call coming in from Las Vegas for the doctor. Your question? Apparently we are having some technical difficulties. Regrettably we won't be able to take the call from Las Vegas. We have a question here that's come in via fax for you. Since there is not a lot of nephrologists, how do you envision people with ckd receiving care in the future?

Dr. Joseph: That’s a wonderful question. There are about 6,000 nephrologists in the United States. So they can really only take care of patients with stage 5 and 4 chronic kidney disease. So we really need to depend on primary care physicians to care care of most patients.

Moderator: Thank you. We have repaired our technical difficulties and we are able to accept that call from Las Vegas. Our question?

Caller: Yes, I’m interested to know what kind of diet you give to the patient on the day of dialysis, before and after, the same day.

Dr. Joseph: That’s an interesting question. The question is, what about the diet the day of dialysis? Most patients eat less. It's been shown on the day of dialysis that may have to do with fatigue related to the procedure. In general, most dialysis programs don't recommend patients to eat right before the treatment or during the treatment because it may affect the blood pressure. But I think in general, that say very specific question that you should ask your physician who is caring for you whether or not it's appropriate for you to be eating before dialysis or during dialysis and what kinds of food you should be eating. Dialysis programs should have dieticians present and it's a good idea to work with your dietician to discuss your diet in general and also specifically your diet around your dialysis treatment.

Moderator: Thank you very much for your call coming from Las Vegas for the doctor. One final question. How can we better educate health care professionals to screen for kidney disease?
Dr. Joseph: I think emphasizing the importance of kidney disease just like we did in the last 45 minutes or so in terms of the death, progression of chronic kidney disease, the disease burden in the U.S. population, the importance of early testing, the urinary albumin ratio and estimated glomerular filtration rate (GFR) and the hope that early intervention blood pressure control, and diabetes control should offer better outcomes in terms of slower rates of kidney progression and prevention or delay of complications.

Moderator: Doctor, it's been an extreme pleasure having you here and raising the public awareness on this very important issue and we are delighted as to the work that you're doing with the national kidney foundation.

Dr. Joseph: Thank you very much for covering chronic kidney disease today. It's a great pleasure.

Moderator: Thank you for joining us today. Please remember to fill out your evaluations online. Your feedback is always helpful to the development of our programs and continuing education credits are available. In addition to your regular feedback, we like to know if you would still be able to participate if we eliminated the satellite broadcast and only made public health live available via webcast. Please include your response in the comment section. This program will be available via web streaming within a week or two. Please see our website for more details. And please join us next month for our program on body modification. This show will be pretaped and broadcast on the December 18 at our normal show time of 9 a.m. Eastern standard time. I'm Joelle Alexander. See you next time on public health, live. The third Thursday breakfast broadcast.