

Philip Goodney: 00:04

Welcome and thank you for joining this podcast, where we will discuss the differences in preventive measures offered to patients with diabetes and peripheral artery disease, or PAD, as well as better delivery of preventive measures to high-risk patients and high-risk regions in the United States. The purpose of this ongoing podcast series is to reduce cardiovascular deaths, heart attacks, strokes, and heart failure in people living with type 2 diabetes. And is based on a collaborative initiative between the American Heart Association® and the American Diabetes Association®, Know Diabetes by Heart™.

Philip Goodney: 00:36

This series is brought to you by founding sponsors, Boehringer Ingelheim and Eli Lilly and Company Diabetes Alliance, and Novo Nordisk and national sponsors, Sanofi, AstraZeneca, and Bayer. I'm Dr. Philip Goodney, a vascular surgeon, and joining me, are Dr. Peter Schneider, who specializes in vascular and endovascular surgery, and Dr. Foluso Fakorede, a cardiologist who specializes in endovascular interventions for patients with peripheral arterial disease.

Philip Goodney: 01:03

So, the topic that we hope to discuss today, and I'm appreciative that we have some of our foremost experts in the country to discuss this, is the fact that the rate of amputations, especially in high-risk individuals, often exceeds three or four times the rate of amputation in non-high-risk individual in the United States. And how we define which individuals are at the risk for amputation, varies by several key factors. And many of those factors have to do with sometimes racial and ethnic demographics of patients when they present for care, but also have to do with health systems and how they interrelate with people in their communities. And then finally have to do with many of the treatments that we provide.

Philip Goodney: 01:46

I'm a vascular surgeon as is my colleague, Dr. Schneider, and Dr. Fakorede is an interventional cardiologist. So, we all do procedures on patients at the very end of the spectrum, the most severe end of the spectrum when they're nearest the risk for amputation. But perhaps because we all see these patients at what is their most severe state of disease perhaps, maybe we should start this conversation at the beginning, when patients may have mild disease or even antecedent to that disease. Perhaps each of us could share some of our viewpoints about why patients who might develop diabetes and concomitant for arterial disease, why they might get minimal disease when, why they might progress to who severe disease, and how and where we think our health care system should most effectively integrate with them. And maybe I'll ask Dr. Fakorede because he sent along a nice series of his thoughts and concerns over his career. And I thought maybe you could share some of your experience with us so, Dr. Fakorede?

Foluso Fakorede: 02:42

I'm honored to share the stage with both Dr. Goodney and Dr. Schneider who have basically has blazed the trail for young endovascular specialists, such as myself to follow through. And so, it's an honor and a privilege to be here. So as someone who serves predominantly a minority population, 80% of whom are African American here in the heart of the Mississippi Delta. My thoughts on this topic are sobering. We're dealing with a disease state that is silent, it's slow, it's progressive. There is little awareness when it comes to the word peripheral arterial disease on a patient level, on a provider level, and on a community level. And unfortunately, we do have the two most prevalent risk factors that I see right here in the heart of the Delta being diabetes and obesity that are interlinked. And so, the diabetes epidemic is what has led to a lot of patients coming in with both microvascular disease and macrovascular disease. And what do I mean by that? A lot of my patients have nephropathy early-on-stage obese signs.

Philip Goodney: 03:46

And Dr. Fakorede can you give us an example of a patient maybe that you saw recently who fits that paradigm? We hear about patients getting their ABIs checked at a screening health clinic or as part of a preventive visit, but I'm willing to bet that perhaps patients don't emerge in that same fashion in the region of the country that you're discussing. Can you tell us about a patient or?

Foluso Fakorede: 04:08

Sure, a 42-year-old African American male who presented to my clinic with basically a gangrenous foot was diagnosed with diabetes seven years ago has a family history of diabetes with both his mom and grandmother undergoing an amputation basically at ages 45 and 50 respectively. Comes into my office after being followed by both the primary care specialist and wound care specialist for over a month and couldn't get a hold in terms of a vascular specialist around the area to take a look at his circulation. And upon an inquiry, I asked about the onset of his symptoms, and it started about seven years ago when he had numbness and tingling and burning and was diagnosed with gout. And later on, as his symptoms progressed, he was told that he would need muscle relaxants to take away and alleviate his symptoms of pain that had progressed. And it was unfortunate because no one had looked into the PAD spectrum to check his circulation, not until three months ago.

Foluso Fakorede: 05:09

And three months ago, he was found to have significant multi-level disease, significant to the point where he had had non-healing wounds and ulcers and had subsequently developed gangrene. And it was tragic in the sense that this was a 42-year-old mechanic, he was a single father of three. And unfortunately, after an angiogram and trying to salvage the limb, he lost that right lower extremity limb we did a above the knee amputation. And so we have the clinical

progression, but also the lack of awareness for years on both the patient and also the providers in the community, but also the lack of specialty care. I was the only provider who could provide limb salvage services to this patient in a 120-mile radius and so it took him a while to get to me.

Philip Goodney: 05:51

Thank you for relating the story of that patient and his age group. As you mentioned, he was in his forties, so he's under the age of 65. And so often health insurance is sometimes a barrier to even integration with the health system at all. And even in this patient circumstance, it sounds like they were able to engage the health system, but it happened kind of slowly. And Dr. Schneider, I know you spent many years caring for the residents in sort of a different part of the country, geographically, but a place where access could be difficult, even in the setting of a, if you will, a health care system that should be engaging all patients. So, Peter, do you mind sharing a little bit of that context?

Peter Schneider: 06:30

Thank you, Phil, Dr. Goodney. A pleasure to be here with you and also with you, Dr. Fakorede, this is a really important topic. I mean the disease itself is multifactorial, but the way the health care system attempts to manage it is also multifactorial with lots and lots of missing pieces in the puzzle. What Phil is alluding to is that for 25 years, I was in charge of vascular at Kaiser in Hawaii, where we took care of a very large number of patients of Hawaiian and Pacific Islander descent, where diabetes is extremely common in the population.

Peter Schneider: 07:06

And it's not the most favorable phenotype in the sense that the young age at which people lost kidney function, became blind, lost limbs. You're talking about Peluso a 40-year-old father of three. I mean, this is tragic, and this is a repeatable story in different places. And there are things though I think we can do about it. One is that I think the health care system itself has not adjusted to the crisis that this is. So, for example, in medical school, my impression is that the students get a lot of education about cancer, a lot of education about chronic lung disease, but they don't necessarily get a lot. They think of diabetes as something that requires insulin management, whereas every one of these patients needs to be examined. I believe that for the primary care physicians that are out there, this may be something that they're not as familiar with.

Peter Schneider: 08:03

People can detect a rising creatinine or a decreasing GFR, but they may not think to look in between the toes of an insensate patient. And the reason why this is such a silent killer is because this burden of atherosclerosis accumulates in conjunction with diabetes in conjunction with possibly poor diet or diets that are low in certain types of nutrition, possibly in conjunction with smoking. And as that atherosclerotic burden becomes worse it's like a growing cancer that the

patient doesn't yet know about it. And subsequently, they step on something, or they have a pair of shoes that doesn't fit correctly, and an open lesion occurs. And now, of course, this is where the patient's lack of sensation comes into play like your patient that had these symptoms of neuropathy for many years.

Peter Schneider: 08:56

Whereas in a standard PAD population of patients, maybe who don't have diabetes, but have other things like high cholesterol or smoking, they frequently pass through a period where they get claudication. And that is pain in the legs with walking from larger vessel occlusion. So many of these patients have only the small vessel occlusion, so they don't have this warning timeframe of claudication where we can work with them and counsel them and push them to change their lifestyles. And so going straight from a completely, without symptoms or imagining the symptoms are due to something else like gout to a position of extreme limb loss it's really a burden. And I think this is a repeated story in our system.

Foluso Fakorede: 09:41

And also, just to mention Dr. Schneider is that the lack of patients who have been labeled as asymptomatic or atypical early on in the disease processes, it's mainly due to also the training, as you mentioned, we're not trained in our medical school or vascular training to focus on that patient population who are predominantly the patients who actually a 70% of the map of PAD we focus more on the critical limb or CLI patient population and the claudicants. And so, what is the progression in these at-risk populations, minorities of asymptomatic, atypical disease to CLI? No one has that data on a national level, which is very interesting.

Philip Goodney: 10:24

Could I ask Peter and Foluso, could I ask you to comment a little bit, because we're all interventionalists that we're trained to do procedures at the end of the day. We do leg bypass operations, we do endovascular interventions, we do amputations sometimes. But as you both alluded to many patients will present to our care and my patients in sort of rural poor in New Hampshire and patients in Hawaii, patients in Mississippi will present with something that perhaps isn't necessarily ready for an operation. They've got a small toe ulcer or a fissure between their fourth and fifth toes, but their A1C is elevated and it's 13 and they're still smoking and they're not on any anti-cholesterol out there.

Philip Goodney: 11:03

What happened maybe if you could give me an example, Peter, what happened when that patient who really hadn't engaged the health care system at all, and they landed in your office because vascular... And vascular tend to be an open door like if you've got a problem, we usually will see it. Whether it's at your wound clinic, that's run by your expertise, Dr. Fakorede, or whether the

emergent vascular surgery clinic, at Kaiser, it's usually a place where you can get in sort of quickly, but then all of a sudden, now you see the problem. So, what were you able to do and where did you start to run into roadblocks or difficulties?

Peter Schneider: 11:34

Yeah. So, I think several things have become obvious through the joint experience of all of us over these recent years. One is that you really, if possible if at all possible, having a team approach is extremely helpful because whereas as you said, Dr. Goodney, our skillset includes doing these revascularization procedures we cannot do everything. And so being in a multidisciplinary team environment. So, we had this in Hawaii, and then now at San Francisco, where I work, we have a dedicated limb salvage or amputation prevention team that includes a multidisciplinary group. And at the very least having wound care and podiatry services are extremely helpful. The patient you described with good medical management and good management of the tissues of the foot may well not need a revascularization. On the other hand, if that same patient were to get a terrible infection there, sometimes the tissue loss becomes overwhelming.

Peter Schneider: 12:39

And I will just say that our best success with revascularization is when we get the patient when the amount of tissue to damage is still minimal. So, in other words, if they have lack of blood supply, but we can restore the blood supply when the tissue damage is minimal. The likelihood of success is so much higher than if it's unrecognized until the tissue damage is extreme, or until the infection has already taken away a substantial amount of tissue. And this is where the orientation of the entire health care system, where visiting nurses, nurse practitioners, technicians, technologists, primary care physicians, are all part of the health care team. And the ability to recognize that and get the patient to the right place early is something that I think requires training and teamwork. And I would say for the most part is lacking except for maybe in the larger, more centrally located systems. And this, I think gives us a real, we have to crystallize the goal here of what I'm talking about, but I think it gives us a lot to strive for.

Foluso Fakorede: 13:47

Yeah, I think as Dr. Schneider you mentioned, it's ideal to have the multidisciplinary team. Especially one that's technically competent to identify and realize that that foot or that leg deserves a fighter's chance because of the consequences of an amputation. As we all know, there's a clinical, economic, and human... 80% of these patients can be dead within five years if they undergo an amputation. But most of the patients that I've encountered who've had an amputation were not given an access or chance to be seen by that multidisciplinary team that's described by Dr. Schneider.

Foluso Fakorede: 14:22

And it's not just by the fault of the primary care providers in terms of maybe a lack of awareness as to not only the disease state but the options that are available in the continuum of care of this disease state. But also, the conditions around it, the social determinants that are in play that either prevent the patient from having access to that vascular quality team or the providers who do not have access to a specialist due to what I call specialty deserts that are pervasive here. For instance, we do not have a resident podiatrist in a hundred-mile square radius here in the Mississippi Delta. We have visiting podiatrist, but not a resident podiatrist. Mississippi has every county represented in the diabetes belt but as a state, only has seven endocrinologists. Those are challenges. So, when it comes to manage that A1C to a goal of less than seven, it's left to the primary care providers who see tons of patients and are burdened with the amount of patients they have to see in a short time frame as well.

Philip Goodney: 15:21

Dr. Fakorede, you highlight it in a especially important parameter in terms of the racial and ethnic differences in engagement with the health care system. I worry a little that perhaps patients in those communities when they see their relatives or their friends go to the hospital and say, well, gosh, all right, fine, I wanted to stay home, but I guess I have to go in. And then they come back and they're missing a limb and it teaches the remaining members of the community that gosh, you should stay away from health care as long as you can. Which is exactly the opposite of what you and Dr. Schneider, both pled for, which is earlier engagement. So can you tell us, especially since you wrote in your notes beforehand, you're really in ground zero can you give us a sense of the temperature amongst those communities. What's the best way we have to try to better the engagement for those, especially high-risk individuals?

Foluso Fakorede: 16:08

Great question. I mean, I think that the problem or multifactorial one, there's been what I call the generational mistrust between communities of color and the health care system, as you alluded to and explained, and that dates decades. But also, it's led to an acceptance that if mom had an amputation, or grandfather had an amputation, well, that is my destiny if I am a diabetic as well. And there is no incentive to seek preventative care, given that that outcome is going to be the same meaning that I will undergo an amputation. And so therefore they don't present until it's late in that stage to seek out care and where they go to seek out care also matters. Now, in terms of trying to engage these individuals, I call that community navigators and gendering the trust of these patients takes not only technical competence, such as both providers here on this panel today and their teammates but also its interpersonal competence.

Foluso Fakorede: 17:06

We need to start going down to the pipeline and having our medical students and our nurses and podiatrists and vascular specialty teams, our interventional radiology fellows and vascular surgery fellows, and interventional cardiology fellows interact with each other early on and learn how to engage our communities. And so that is how you facilitate kind of care-seeking behavior in these communities is by engendering in the trust of these patients early on in the process.

Foluso Fakorede: 17:32

But two, our health care system is not designed for providers and physicians to leave their worksite of services and go to a faith-based community or civic center. And that's something that you have to do in some of these rural pockets. That is where you meet the people where they are, that is what that means. And so that is basically the start and then addressing their social determinants. It's a big deal, transportation, some things as transportation or their literacy level.

Foluso Fakorede: 18:00

In the black community, a lot of patients actually don't smoke tobacco in rural areas, they dip, or they chew. And so, when we're coming up with research titles and questionnaires, we need to ask those simple questions. Do you use nicotine products? Not, do you just smoke? You miss that gap when it comes to ascertaining information and that's what we do down here, it's meeting them where they are and looking at all these factors, engaging the community navigators to help us elicit that information that we seek.

Philip Goodney: 18:29

Thanks very much. Peter, can you comment on that sort of opportunity for engagement that Dr. Fakorede sort of described? You were part of essentially a single-payer health system for 25 years, which theoretically should even out some of the access issue and might perhaps free up people for some of the opportunities for engagement. Did you see that happen over time, Dr. Schneider, or what happened?

Peter Schneider: 18:52

Yes. It's a fairly sophisticated system here as a single-payer system, but at the same time, it's the definition of rural. So, two-thirds of the populations on one island Oahu and the remainder of the population, you have to take a plane or a boat to get there. So, getting somebody here from Hilo or Kona, or, who knows the north shore of Maui or something like that could potentially be challenging. And I agree with what Foluso said, and I would just one-up you, I would say, it's not just acceptance by the patients that this is my fate, kind of a sense of like, I'm going to wait as long as I can. A lot of the doctors were like that too, because when they aren't familiar with what can be done to prevent amputation, what

can be done to restore blood supply, a lot of the docs sort of felt like, well, geez, I'm not sending this patient any sooner than I have to because all they can do is amputation.

Peter Schneider: 19:51

And so, one of the things that I did and it's exactly what you're describing in my first two years here, I gave 34 talks. Not just out in the community, but also to our own doctors to get them oriented, let them know that this was now on the table that we needed to go after these limbs. Now, of course, things have changed there's a fairly sophisticated limb salvage program, but that's just one place that's the thing. It feels like a Herculean effort, but there are so many more people who are interested now, both on the medical side and in the broader community. And I know Foluso, you've done some pretty cool things in media. And I saw an article in ProPublica, which I was really impressed with. And I think, you are melding with the community and making it a community voice and not just one doctor saying, hey, this is something we need to do.

Peter Schneider: 20:47

I think that's how you drive change. And also, I'm taken with this concept of specialty desert. We have it in Hawaii to some extent we try to make up for it. But I think the basic challenge that we face is that vascular disease is so closely associated with poverty. And with poverty comes other terrible things, like lack of access to care, lack of early referral to specialists, lack of a community of people who are going to say back to that person, hey, you need to get organized, get motivated and go seek care. So again, that's our challenge, but there are more people interested in this now than ever, I think. And I kind of feel like we're right on the edge of making some real progress on this particular problem.

Philip Goodney: 21:35

You know, the concept of a community engagement specialist, if you will, the like a person to do the work. And like you said, Peter, the 34 talks you give or Foluso the elegant sort of community integration you've described scaling that I wonder like, how can we do it? How can we make sure it has staying power and keeps happening and who should do it? And so, Foluso maybe you can go first and maybe Dr. Schneider after that, but tell us if there was a phenotype? Because I mean, at the end of the day, vascular specialists are kind of expensive. Like who could we train to do this? Or we could disseminate it across the country, especially in some of the areas where health care provision is difficult?

Foluso Fakorede: 22:13

Well, when it comes to scaling, that's the challenge, right? Because one, you have to have buy-in. Buy-in not only by the person or persons who are going into this rural pockets. I mean, you're bypassing, what I call big cities or metropolitan areas to go into these rural areas. And for me to, for instance,



have access to Starbucks from where I am, I have to drive two hours. So that's the mindset you have to have, right? It's that, we're going to an area just as you do with Doctors Without Borders, you have to understand the challenges that you're going to face, but to the reward is actually greater. Two is that you have to understand that you're going to be dealing with chronic disease management. And when it comes to chronic disease management in our field, I think that given the shortages of not only specialists across the board, I mean, we're talking about, we act like we have just a multitude of vascular specialists out there we're a small community.

Foluso Fakorede: 23:06

I think the incorporation of advanced practitioners in terms of chronic management disease manage is very key and very important because they help in terms of disseminating that information. And they were actually my first targets when I came here, Dr. Schneider in giving talks to I targeted the nurse practitioners first because I realized that in rural communities that they served as their primary care providers. And so that was very successful in handing out my phone number and teaching them how to take off the socks and inspect the pulses and perform APIs as well. And then, in terms of having not only medical schools but also fellowship trainings. What we do is we invite them to our world by either giving talks to them or exposing that there are opportunities to do good, to heal, to be humanistic to compassionate, but also to be able to say that I decreased amputation rates by a certain percentage, I decreased A1C rate by a certain percentage that is great.

Foluso Fakorede: 23:59

And what would be greater is if you had federal programs that say, you know what, you go to this community and you effect change by delivering some kind of metric where you can decrease amputation rate blah, blah, blah, or you can decrease, A1C rates by a certain percentage and the reward can be, some kind of incentivization of your student loans being paid off for instance. That would be great in an ideal world but that's not done right now unless you're recruited by a big hospital system. So those are things that I've kind of thrown out there and we're working with policymakers obviously and other people involvement in the care continuum, but that is something that we have to take a look at to really go out there and be disruptive a good way to effect change.

Philip Goodney: 24:41

Thanks, Dr. Fakorede. Dr. Schneider

Peter Schneider: 24:43

Yeah. Those are really, really strong points that you made Foluso. And what you said about, we really need to mobilize the rest of the health care workers, practitioners that are out there because we are a very small group. As you mentioned, even though we're combined between vascular surgeons,

interventional cardiologists, and interventional radiologists, we're still a very small group that are really passionate about this. And without those folks on our side, the advanced practitioners, primary care physicians that of course are balancing so many different things. The more we can do to get them oriented, get them to preach from the same page as we're talking about. I think those are extremely helpful. I think also, we as a group have not been very good about telling our story. People think that an amputation is the end of the story and you already alluded to this, but actually no, this is a massive contributor to early death, the economic tragedy for the entire family, then things go from bad to worse.

Peter Schneider: 25:53

Maybe a person that was working can't work, a person that was mobile no longer is mobile and needs a tremendous amount of help. So, I think the return on investment, let's say, if you're just looking at, say one procedure versus another, or the cost of say wound care or something like that is trivial compared to the economic cost to the entire system. And I think the more we can have people realize that, that the return on investment for saving a leg or preventing an amputation, it's a huge investment, not just in terms of morbidity and mortality, but also economically for the family, for the surrounding society. Then that person then is maintaining their independence and is not using up what is also not unlimited resources that their family has.

Peter Schneider: 26:45

And then lastly, I'll just say this idea of us doing what we can to help other people understand. And again, you already alluded to this, help other people understand the amazing reward that goes with being passionate about keeping people whole. And I think it's an extremely compelling message, but we're not really telling it in medical school. Maybe the places that have the most collegial and advanced amputation prevention programs are telling that story. And I kind of feel like there are a lot of bright, young practitioners that are getting really enthusiastic about how their career could benefit and how their life's fulfillment can benefit from a career where they do a lot of focus on amputation prevention and limb salvage. And I don't know if you all have any reflection on that, but I feel like again, we have to tell our story better, not just to the folks that need these services, but to the folks that could potentially provide these services in the future.

Philip Goodney: 27:51

Peter, I think that's a great point. And I do think you're right, that the amputation is such sort of a negative outcome and is thought to be the period, if you will, at the end of the sentence. But the counterfactual is that the limbs that saved that's the patient they have stayed at home, that walked to their grandkids graduation, that really kept living their life. And it was the vascular intervention and the care of their multidisciplinary problems that often was a big row to hoe if you will but was able to get them there. I wonder especially

alluded to sort of the return on investment if you will, and sort of measuring success because there was a, I'm sure you saw this in the newspaper a year or two ago, where in the state of California where the amputation metrics are pretty carefully measured and recorded, there was one particular health system that decided to do some outreach and bring people in and try to take or diabetes a little earlier.

Philip Goodney: 28:40

And they ended up doing more toe amputations if you will, but probably in the net preventing some major above or below-knee amputations. But the way the, in particular, quality metrics were set up was rather simplistic. This health system was then penalized because they had performed more amputations if you will. Even though they were minor toe amputations done in the context of essentially saving a diabetic person's foot from their diabetic foot ulcer. So as a specialty, what should we measure in the communities that we take care of to try to best indicate where our efforts have been focused? And like you said, what the return on investment should be, is it amputation-free survival in the community? Is it number of admissions? Is it a number of amputations? What should we put on the books as our metric to shoot for?

Peter Schneider: 29:24

I think a toe amputation that is not followed by a major limb amputation is a victory, not a loss. It seems as though the accounting in that particular instance that you've cited was, they got it exactly the opposite of the way they should have. I mean, I think of these types of foot surgeries as being absolutely necessary in most of the cases. And it's a preamble to saving a leg typically. In terms of the metrics and what should be followed. This is a really, really good point us doctor types, we tend to identify problems, but it's actually really challenging to come up with solutions. And I think this idea of how do you even measure success is something that we probably need to be vocal about defining that because how would anybody else know what a success is or not?

Peter Schneider: 30:20

I mean, from my point of view, and I'm looking at some of the statistics that Foluso had cited from his area and from his work. And I'll just say that having an excess of amputations in one area compared to another, in one ethnic group compared to another is to me, it's a tragedy. They all should be the lowest they possibly can be. And I think to me, it's major amputation because that's really the difference. The rate of major amputation is what we really ought to be looking at. And I know Foluso had cited some of those figures, so I'll leave it there, but that's my sense on what we should be looking at.

Foluso Fakorede: 31:00

Yes, Dr. Goodney and Dr. Schneider, great point. I think that, when you look at the loss of productivity to society in these patients, you tend to see that in

patients who underwent a major amputation not minor amputation and so when someone has a toe taken, they're still like, say they're still functional. They're able to still do the things that they need to do. Go to work. This 42-year-old if he had a toe amputation would still be a mechanic today and be able to provide for his kids. And his hourglass will still be preserved at least for the most part. But you can look at other metrics, I mean, how many of these patients eventually have major adverse cardiac events that we all are scared about, right? That's what kills these patients, the heart attacks, the stroke rates, and death. And so, it's not only amputation rates between the hospital systems in terms of the communities where these patients reside. It's something to take a look at and reporting of those amputation rates. But I think major amputations should be something that we look at across the board.

Philip Goodney: 31:59

I agree it's a discrete metric. That probably is the tip of the spear, if you will, but does represent a bit of our success. So maybe as we close our discussion, maybe each of us might share. Because I think we talked quite a bit about, sort of community engagement and, ensuring that the health system takes care of the entirety of patient is across the spectrum of their problem here. If we had to put forward, this is a big problem, and we'll need big solutions. If we were going to put forward to our societies or to our physicians that work with us collaboratively in the regions where we take care of patients, what do you think should be the next steps?

Foluso Fakorede: 32:34

Well, I think the next steps is Dr. Schneider, as you mentioned, the system is designed to get the results it gets in terms of our health care system. And if we want to figure out why bodies are ending up in the river, rather than figuring out what's making them jump into the river. I think what we need to do to start are screening these patients upstream. And that's where the US Preventive Service Task Force comes to play because that's the governing body for a lot of their primary care docs and the gatekeepers for a lot of these patients who tend to see primary care docs and physicians first before they see specialists. And in terms of an awareness campaign to do so, that's something that goes hand in hand. First of all, we need to know what the disease is, recognize it. That has to be a national campaign as to what its implications from both clinical economic and in human are. And then we need to have preventative services just as we have in the oncological space, in play for patients who are considered at risk. That is key.

Philip Goodney: 33:32

Couldn't agree, more. Dr. Schneider?

Peter Schneider: 33:34

I really like what you said about modeling, what some of the things we can do after what's happening in the oncologic space. I mean, the mortality after amputation is very similar to many types of cancer, some of the worst types of cancer. And yet, as you say, screening for cancer, other types of educations are out there. So, my wish list would definitely include early screening. I think also there probably is more that we could do to create some type of a national education program for primary care physicians, physician assistants, nurse practitioners, and other front-line people who are again, checking many boxes when they see a patient. But if they had more education on this, they may have a higher comfort level and a higher level of awareness of what the stakes are. I think also we could do more, we talked about this concept of a multidisciplinary environment, but it's very much siloed.

Peter Schneider: 34:34

I think we could do more to share geography to geography, metropolis to metropolis however we decided to do it. To do more sharing on best practices and outreach and how we can generate the interest. And also, the enthusiasm to have these sort of, no one person can carry this burden on the health care provider side. So, our own professional and personal lives will be extended if we have a group of us that are interested. So, I think more can be done there. And lastly, I think more could be done by our own specialty societies to raise awareness and to have joint groups, committees, et cetera, that look at specific things like education of medical students to these problems. In any event, like I said, it's a long wish list, but I feel like we're at a point where there are so many people interested now that just wasn't the case five or 10 years ago. And of course, the health care burden is so high and so obvious now it gives us a lot to think about and to work on.

Philip Goodney: 35:41

So, I'll just to echo in terms of my suggestions about next steps. I think that the two keywords I heard from both you guys is dissemination of simple and clear messages. And I want to acknowledge Dr. Fakorede's expertise in really distilling a very clear and cogent message in some of the most difficult environments across the United States and making it ring loud and clear how we can best engage with our communities and try to make a difference in a problem that's not impossible to solve. Amputation rates have fallen. I think we want to make sure we remind ourselves in the general population, they've fallen by almost 60% in the last 15 years, but in many ways, those were a bit of the low-hanging fruit. And the amputations that remain to be prevented are going to be a challenging in communities. But just because it's hard, doesn't mean we shouldn't do it and it will take as you alluded to multidisciplinary approaches and big teams and large efforts.

Philip Goodney: 36:30

But I think by disseminating messages to the communities, and then as you alluded to as well, Peter educating sort of the next group of clinicians who will be boots on the ground, whether it's physician assistants, podiatric assistants, anybody who can make sure this is heard loud and clear, it's hard to think this won't make a difference. Because I remember 15, 20 years ago, it seems like we were doing a lot of bread-and-butter amputations for PAD that now almost routinely never happened. So, I'll look forward to 10 or 15 years from now that we can talk about, hey, remember when this was such a big hill for us to climb, but we made a collective effort, achieved some success. So, I want to thank my colleagues, Dr. Fakorede And Dr. Schneider for a lovely discussion here today and want to thank the Know Diabetes by Heart initiative, which is one of the initial efforts to really help in this dissemination. Thank you very much.