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**CHRISTOPER** So let's talk a bit about collaborative efforts in back pain, about some of the issues with back pain, and why it's a  
**STANDAERT:** problem, and what we're trying to do here. We'll go through the back pain problem and talk a bit about outcome. So we can get to some of the issues that are really at play in these patients and what we're trying to do. And we'll talk a bit about collaborative care here at UPMC, and some general ideas on collaborative care in general, and why and how we might want to do that.

So back pain is obviously a huge problem. So if you look at the leading causes of early death and disability in high income countries, it comes right after heart disease. It's rather astonishing. It's ahead of stroke. It's ahead of lung cancer, ahead of COPD, ahead of a lot of other very significant medical conditions. And this translates to dysfunction, this translates to medical expenses, translates to lost life and productivity. So it's a major health problem for us in our country. And we do lots of things for low back pain. There are lots of treatments. There's a huge array of things.

We can exercise in various ways. We have lots of pills we throw at people. We have lots of needles we can put in people. We can do various, manipulative and hands-on therapies. We can get needles places. We can put cement or other things in bone. We can replace this. We can get scopes in pretty much anywhere in the spine if we have to. We can do lots of stuff, and we do lots of things. This is somewhat older data but it continues. If you track this data-- as you move over a decade or so from the '90s in to the '00s, we just kept doing more and more and more of everything.

We did more MRIs. We gave out more opiates. We did more infusions. And we just kind of keep going up. I'm a physiatrist. I can't just throw everybody else under the bus. This is what happens with the interventional pain procedures going back to 2000 to 2016. It's just steadily up and up and up in terms of frequency per population. And if you go back to 2016, we were doing about one interventional pain management procedure in the spine for every ten Medicare beneficiaries, which struck me as a rather astonishing number. That seems like a lot.

But does all this help? Does it get us where we wanted to go? If you go back and look at the data that tracks people and their health status over the time frame when we were rapidly increasing what we were doing, what happened to them? We clearly spent a lot more money. We did a lot more stuff to people over this 10-year span from '97 to 2005. And unfortunately, what happened is our population got worse, not better. We spent money and went the wrong way. The proportion of people who had low back or neck pain with functional limitations went up despite doing a lot more stuff and spending a lot more money.

And the people who had spine problems were worse. They had worse mental health, worse physical function, worse-- worse work and social limitations. So it seems the more we did, the worse our population, which is the exact opposite of what we would want to be able to do. It tells you something about what we're doing. And part of our problem is that what we do isn't what we should be doing. The spine world is sort of plagued by guideline-discordant care. This is a study from Carey in 2009. They surveyed 700 adults in North Carolina with back pain to see what they were doing.

The fascinating thing is these people have back pain on average-- 10 years was their chronic low back pain, but 85% of them were seeking care on a regular basis. The authors politely said the tests and treatments do not reflect the best evidence, which is an understatement of what was actually happening. What they found is a huge overutilization of metacases, especially muscle relaxants and sedatives of various sorts, imaging and passive care modalities, and an underutilization of exercise and treatment for depression. When I got here to Pittsburgh, we wanted to look to see what our system was doing. And if we're going to try to do it better, what are we doing now?

We had to get a base state of where we were. So we looked at what we were doing in the St. Margaret's Catchment area. We took people who had no low back pain in the prior 12 months. And we found people who visited a PCP for low back-- who visited our system actually had a charge for low back pain after having not had one for about a year prior to that. And we had about 2000 members in the St. Margaret's area who came in in this way for a back in 2015. And we tracked what happened to them, their utilization of care, costs, all those issues.

And what we found is that in the first year from the visit from low back pain is that 46% of patients wound up with an opiate, 50% received imaging. We spent half a million on chiropractic care, \$3 million on surgical care, and 9% of them went to physical therapy. And we kept tracking for the next two to three years to see what happened. And then the second year, 30% of these people kept seeking care. And by the third year, 26% were still seeking care. We call these the spinners because we tracked what happened to them and they seem to just sort of bounce through our system.

They went from PCP to a chiropractor to ED to surgeon to anesthesia to ED to psychiatry to surgeon to-- they just spun. They didn't land. They didn't end. They didn't get out. They just spun, which means they're clearly not getting better. Interestingly, when you looked at our data, we found several other things that are curious. We found very strong correlations between back pain and mental health diagnoses, which I think most of us would have predicted, so depression and anxiety in particular. We also found low back pain correlated fairly highly with osteoarthritis, heart disease, and diabetes. And it made us start thinking, is low back pain really an isolated disease?

And I think in some people, we see low back pain and we think that is the disease, that is the symptom they're presenting with, that is what we're trying to treat. But if it's tied into these other diseases that relate to mental health, and well-being, and lifestyle issues, and general mobility issues, maybe it's more just a canary in the coal mine. It's sort of like if you had somebody with diabetes and they presented with tingly feet, and you just treated their tingling feet but didn't treat their blood sugar, you wouldn't get very far. And I think maybe that's what we do in some ways. So I think in some patients, the little back pain is part of a systemic health process. It's not an issue in and of itself. We go after the wrong thing.

If you go nationwide, it's sort of fascinating when you look at what exists in the population of people with low back pain or spinal pain. So if you take chronic spinal pain, you will find that spinal pain is almost twice as common in people who have an underlying mental health disorder, so 16% of the general population, but 29% with mental health issues. About 35% of people with chronic spinal pain have a mood or substance use disorder. And the odds ratio of depressing, dysthymia, bipolar disorder, anxiety and PTSD is all greater than 2 if you have chronic spinal pain. So you get to that, if you just have-- if you have pain, what is it? Is it just pain? It probably isn't.

When you look at what we do and say, does it work or doesn't work? Why do things not work if we do them-- if we seem to be doing them for the right reason? So this is just one of many studies on similar subjects. Merrill did this study in 2018. They looked at decompression for spinal stenosis. And they had 55 patients without depression and 56 with depression. I wanted to see what the difference was really. And interestingly, the patients who had depression did improve. They got better with their decompression. But compared to people who did not have depression, they had worse post-operative scores for pretty much everything. Physical function, depression, pain, and ODI were all worse. They just did not do as well.

Celestin, in 2009, put out this review I thought was interesting. They looked at the predictive value of psychological factors in lumbar fusion or spinal cord stimulator placement. They sort of combined them all. And they found 25 studies that looked at this, that looked at psych factors, psychological factors. And when they did it, they found the minimally predictable pre-treatment factor. So you're looking at things that you could find before you operate or put in a simulator and say, what's going to predict how my patient is going to do when I'm done? Physical findings, pain levels, and activity interference were minimally predictive.

So this is your exam, this is your pain levels, this is your ODI, or whatever you choose to get, which is pretty much what most people get. And they're really not that helpful in predicting who's going to do better. What predicts who's going to do better? Things we don't get all the time. The presence of somatization, depression, anxiety, and poor coping. And so if you really want to know who's going to do well with your surgery, we should be doing these routinely. We should be asking about these things all the time. And if we want to optimize our response to invasive treatments, we probably should try to optimize the state of these factors.

Because they are more important in predicting response than largely what we do and what our medical documentation requirements say we should do. And when they look at those 25 studies, 92% of them found a positive correlation between at least one psychological factor and poor outcomes. It's a remarkably consistent finding in the literature, which is why these is just a sampling of what's out there. So what is going on? Why-- we have this problem where we have back pain. We have a decent number of people who just spin in our system and go from provider to provider, getting no better, having things done to them, and coming back to see all of us essentially.

We spend an awful lot of money. We get more and more invasive, and our population gets less and less healthy. So why is that? It seems counterintuitive in a lot of ways. Part of it is probably that we pay for the wrong things. The more invasive the procedure, the more we get paid. That's just what happens. As a physiatrist, if I want to make a lot of money, I should inject everybody. I would make a lot of money doing that. Our care is too siloed. We're all broken apart. We don't necessarily work collaboratively which is the whole point. And that interferes with this whole sense of a whole person assessment.

A lot of it, I think, is also that, especially at the primary care level, we don't approach low back pain as a chronic disease. We think of low back pain-- and if you read the literature, especially a lot of the primary care literature and guidelines, it talks about low back pain as a self-limiting disease. People get better in six weeks. You don't have to do anything. The problem is it's not really true. They may get better in the short run, but the recurrence rate is extremely high. It tends to be 60% to 80% of people. If somebody has acute, disabling low back pain, there's about a 60 to 80% chance that it's going to happen again in the next year.

Spine problems are a chronic disease. They're not a single self-limiting problem. And if our guidelines all tell us to approach it as self-limiting disease, we go the wrong way. We don't pay attention to chronicity I think in a lot of ways we are treating the wrong thing, meaning that we focus on pain as a health system. We focus on pain. We don't focus on health. And if back pain is really tied into other comorbidities and other related health conditions, we have to focus on health if we're going to get people better. We can't just make their pain vanish. And I think that is part of the question.

When we say pain, people come in and they all get a rating scale of pain of 0 to 10 sort of thing. But in that number, people say, I have a 5. I have a 7. I have a 3. What is that? What are they talking about? Are they really talking about pain? Is that really what's troubling your patient? Is a pain or is it that they're suffering? They feel loss. They are frustrated. They're sad. They're overtly depressed. They're anxious. Or they're fearful. It's just a few of the emotions I think we subsume in that number of pain. And so then we translate all these things and we say they're pain.

We don't necessarily overtly say we're treating fear. If you look at chronic low back pain and you say, what happens to people who have back pain for a while, all sorts of things go wrong. It's really not just their back. They get discrete changes in their peripheral and central nervous systems. There's a lot of functional MRI studies showing changes in the brain. Things are different when they hurt for a long time. They clearly get alterations in their mood and in their sleep. Their physical conditioning goes downhill. And their social functioning, and social roles, and social identity all get affected.

And so this is all that's happening. It's not just the MRI. It's not just the back pain. There's lots more going on with these people. And as a system, we know that psychosocial variables are much stronger predictors of outcome than any biomedical variable. We all know you cannot line up 100 MRIs and know that 50 of those people have back pain and find the 50 that do. We're not good at that. Our MRIs don't help us with that. But despite this, despite what we know, our system largely follows the model of a pain generator, which is not my favorite term personally. Disc, joint, muscle, fascia, we try to make it into some anatomic thing we can relate to and we can explain to our patients.

And in essence, what we're doing is we're taking this complex, experiential phenomenon of pain, which encompasses multiple domains of sort of human experience, and we make it into a single item. We call it pain. We don't ask about these other things. We don't ask about suffering, and coping, and fear very often. And in medicine, pain is nociception. I think we recognize that at some level it is quite that clean. But when you distill it down, that is what we're taught. And that is how our system responds. How do you treat Deception Well, we medicate it. We especially give it opiates. We immobilize it. We give it shots. And we operate on it.

If you think of like a broken ankle, this makes sense. You think about two years of back pain, this doesn't make any sense. This is a failed model for treating back pain, and that's what we've been doing. And it doesn't work. It doesn't work for our population. And we need a better system. We are fractured is what we are. So what does that look like? I think we have to accept several things to get there. First, we recognize-- we have to recognize that spine is a multidisciplinary problem. Most of us cannot get our patients all better by ourselves. That just doesn't happen very often.

The vast majority of patients with back problems really don't need surgery or interventional care, and they really don't respond well. In part, this means everybody with low back pain does not need to see a surgeon. One of the things that continually amazes me is the sheer volume that my surgical colleagues have of people who clearly don't need to be seeing a surgeon. We have to recognize about a quarter of patients who come in with back pain, even at the primary care level, are at a high risk for chronicity. And when you start saying, how do you invest resources and do things, that's where we start focusing. Because they are the ones that really wind up in trouble. They become the spinners.

So what is better? How do you get a better? If I say, there are these problems, great. There are these problems. How do we get to better? I think at some level, we have to start learning how to stratify our patients. And that gets to this chronicity issue. And who are those people? Who is at risk? One of the tools available now is a STarT Back tool which helps predict. And what it does is it satisfies people by sort of high, medium, and low risk of chronicity. And it differentiates a bit, but it's not 100% by any means. And I think there are probably ways we can get at this and data.

As we get to big data and we actually start looking at numerous patient factors that are available to us in our electronic records, we can probably start doing this. We can probably start stratifying and genotyping people. And that is one of the goals we have. I think we need to get appropriately trained personnel to help triage and perform initial managements. Spine is its own thing. Those of us who do it know that it's its own thing. And people have to be trained to deal with it, because it's complicated. This is not effectively done at the primary care level. It's just not. People are not triaged correctly. They're not managed correctly. It's just not done.

The primary care system isn't really capable of the nuance that's necessary. We have to get to coordinated, multidisciplinary care. That's how we find a better solution. If we want to get the right care for the right patient at the right time, that's what we're going to need. Because that's the only way to sort through people to get there. So I just want to put in a brief plug here for non-op care as a non-op person. What is appropriate non-op care? I think that's an important question in some systems. Unlike what the insurance companies seem to tell me all the time, appropriate non-op care is not six weeks of PT and a failed epidural.

That is just not what-- that is not it. That is not what non-operative care is. What is non-operative care? It's paying attention to the whole person. It's individualized treatment by spine providers who know what they're doing in the spine space. It's psychologically-informed care and support, because there really is a lot of psychological adjustment to trauma and injury, which is what a lot of our patients are dealing who are aging. It is focusing on health and function. That really is what becomes important to our patients. They want to live a meaningful life. That's what they want. And it is goal directed.

That's how you start getting somewhere. You start creating goals that are achievable and working towards them. So what did we do at UPMC for this? So this is one-- I'm just going to talk about a program we developed called the UPMC Program for Spine Health, which is a collaborative structure built with the work of numerous people, and components, and entities from within UPMC. This is just one pathway of getting towards collaborative care. So it's more of an example. And we built a collaborative, coordinated care model.

We have a care team that consists of a nurse navigator, a physical therapist especially trained as a spine-- primary spine provider, which I'll explain in a second. PM&R physicians, at the moment there are two of us, myself and Dr. Karren Barr, a pain psychologist, dietitian, and we have a UPMC health coach live and in person to work with our patients. And we all work collectively. We talk every week. We have common educational space. We work together. We built on it. We built this on a population health model essentially. We're going after the higher risk individuals is what we're after.

We're trying to take-- essentially, we're trying to take medical resources and apply them to high risk patients, a high risk population, to keep them away from things that will be either harmful, or wasteful, or otherwise useless and expensive for them to pursue. So we try to get them better early by applying resources that might not be available otherwise. We use the STarT Back questionnaire to help us re-stratify a bit. That's our best tool at the moment. We also get-- we talk to PCPs and tell them, when you don't really know what to do with somebody. They're not doing well. You're not sure what's going on. Don't guess. Don't just send them for an MRI on off to a surgeon. Please let us know.

And we can assist with care and help them find a more rational path forward. If people just are not progressing. They failed prior care. They struggle with issues of their own health care and self-efficacy, they're not going to do well. Because they just can't function well enough around their problem to do well. And they are also people who would come to us. So when we get them, we screen them and triage them by our nurse coordinators. This goes back to having personnel who are trained in what they're supposed to do and how to screen and triage.

So she uses some of the same things we just talked, STarT Backs and other things, and medical history, and what they've done, and what kind of imaging they have. Most of our patients go to a physical therapist. We call this a primary spine provider. These people are trained through the unique program at Pitt, through the School of Health and Rehab Sciences. It basically takes highly experienced physical therapists or chiropractors, PTs who really have an interest in spine and have been doing this for a number of years. And they put them through a year-long training program in advanced spine care.

And they talk a lot about surgery, and interventions, and medications. And they have a fair amount of training in behavioral interventions and motivational interviewing so that they can help develop a much more psychologically-informed approach to managing these patients, as opposed to simply bedbugs and [INAUDIBLE] kind of exercises. So in our system, most of our patients start with the primary spine provider. If the patient has medical concerns, if they failed prior PT multiple times already, if they see the primary spine provider, and they're not going anywhere after a few visits, or that provider has concerns-- they think they're numb. They think they're weak. They're worried about something going on. Then they come see the physiatrist.

And again, Dr. Barr and I-- Dr. Barr was my colleague in Seattle for a long time. We've both been practicing non-operative spine for 20 years or more. We have a dedicated pain psychologist, dietitian, and health coach. As I said, we bring them in as needed depending upon what the patient wants and what their goals may be. We will then refer for imaging, spin interventions, and surgical consult as needed. These people come in and things are wrong. And we find-- we find spine problems that go bad.

We find spondylolysis with horrible stenosis, but I've also found a number of patients with AVN in their hips. I found Lyme disease. I have found ALS. I have found a number of other things that masqueraded into our clinic as a spine condition but clearly wasn't. And so we evaluate them and then we get them to the right place. What do we do? What's the point of our program? It's a lot of education. We educate the patient on their condition. I really believe that if you can help people understand what is going on with them, and what their barriers are, and what their limitations may be, and what solutions may be more effective than others, they can do a lot better.

We address fear avoidance and unhealthy beliefs. We engage people in physical activity early. That's really the whole point of seeing the physical therapist first. We want them moving quickly. We enhance those that their self-efficacy. This is one of the things we track in our patients when they come in is their self-efficacy level. And we try to get them back to community-based fitness and health programs. And importantly, we keep them back with their PCP. We don't want them bouncing through the system and going to EDs. We want them back with their primary care provider, because this is part of their being healthy.

Things we don't want to do. We don't try-- we don't medicalize complex issues. We don't instill fear. We don't encourage passivity or even offer passive treatments. For example, our PTs don't have heat or ice in the physical therapy room for these clinics. There's no heat or ice. There's no passive treatment. And we don't follow guideline-discordant care. And we try very hard to avoid low value care. We try to follow things that the evidence says are helpful for people. So what have we done. We opened the clinic at UPMC Hampton in July of 2019. That was our initial site. It's in the experimental sort of collaborative site for UPMC.

We have 28 primary care providers here that are part-time. We've since added a clinic in Lemieux-- UPMC Lemieux, and UPMC Bethel Park just this year. And we integrate these with our primary spine provider. Physical therapy is through CRS. So it's been a-- this goes back to collaboration. This is all those departments and providers we had, along with CRS. Its own entity within UPMC. And in this-- I have outcomes. We track everything. We built this is a giant QI project essentially. So we track everything. We track utilization, and we track where they go. We track who they see. We track everything.

We track satisfaction when we survey our patients or when we survey our providers. But just to get the clinical outcomes and what happens to people when you treat them this way, we use a PROMIS score. So a PROMIS is a set of standardized outcome measures that are developed internationally, essentially through a consortium. And so UPMC uses a PROMIS-16 developed by Dr. Hammer, which is a streamlined version of a PROMIS-29. So the PROMIS-16 is 16 questions that gets at eight domains of health essentially. Depression, anxiety, pain interference, sleep, physical and social cognitive function are all in there.

So it's all those domains of well-being that we're assessing. So for our primary outcome for a clinic, we track this on our patients. We combine the metric of all of those, because we're trying to treat everything. We're after their physical, their social, their cognitive functions. We're after depression, anxiety, and sleep, and fatigue. So we're after essentially every domain of the PROMIS when we treat people. So we combined our metric to see how we did. And so we track our patients. We are responsible for our outcomes.

We calculated mathematically essentially an MCID, mean clinically important difference, for our patients to say, have we achieved meaningful change in our patients? And we defined essentially a substantial clinical benefit as doubling that. We did follow up PROMIS scores and about half of our patients. If you track nationwide, most people who report PROMIS data get data on maybe 20% or 30% of their patients-- they get follow up data. So we're a lot better than national averages on PROMIS scores. And we do fairly well. So if you look at days within our program, within 41 days we have 56% of our people who have hit their MCID for their PROMIS scores.

And these are difficult, challenging patients. They're patients with recalcitrant problems. Almost all of them have failed something else before they got to us, if not multiple things. So go back to the collaborative part for a second. So we can talk about that a bit more. This program was developed collaboratively within the whole system. So when I got here, conversations-- well I had conversations with everybody across our system. But multiple clinical departments had input with this, and discussed about how we can proceed, and what might be helpful.

There was tremendous support and efforts through the UPMC Health Plan with data analytics, with the highest levels of the Health Plan supporting this and driving the integration. The UPMC Wolff center doing-- helping us a lot with program development. But it is a whole collaborative effort across the system, including collaboration with the Department of Neurosurgery. It's really intended to complement and optimize existing care. We didn't build this as a way to take business or claim something. That wasn't the point at all.

It was something that wasn't there. There's a space for these patients who need something different to help them get better that we don't offer for them. Otherwise, they just spend. So it was intended to complement and optimize existing care. We really wanted to improve the efficiency and care of the PCPs, and the EDs, and our surgeons. And we wanted to help everybody with more appropriate pathways for patients who need them, and help with triage systems that are more effective so the right patients get to the right providers and they have the right resources available when they get there.

And again, this particular program focuses on patients at risk of chronicity and poor outcomes with standard care and with interventional care of any sort. So just a final note on collaborative care in general and how we might think about getting there. So this is one program. And it's a lot to build a program like this. It took a lot of effort. And it takes a lot of ongoing effort to do it. And it takes financial support. It takes data and analytics support. It takes a lot of cognitive support of all the people involved. So when you think about this-- in general, the spine problem of working in a fractured system full of silos were not helping our patients the way we really would like to be, I don't think.

We need to get rid of silos. It's really what we need to do. We need to work collaboratively. Some ways to do that. We could be thinking about-- everybody could start thinking about co-locating clinical care. It really does help for the neurosurgeon to understand what I do. It helps me to understand what they do. It helps me to understand when they can help my patients and when they can't. It helps them to understand what I can do for people when they're not sure where to go with them or when they need another alternative. That helps a lot.



And so by co-locating, we would have a much better understanding of what we all do and how we work together. I think multidisciplinary education is important. We actually just started at grand rounds for our program for spine health, which is aimed largely at our PSP, those trained physical therapists. There are, at the moment, about 30 of them through the CRS system. There's another 20 or 30 graduating from the program this year. So it'll almost double the amount of PTs within our system.

And so I speak. I'm hoping to get some of my surgical colleagues to speak to these people. We're trying to create a multidisciplinary, educational space. Everybody is welcome to get on the call and listen to the lectures. We've had our psychologists talk, our dietitian talk, our pain-- our health coaches talk about what they do and how that works. And we just sort of keep going from there. But I think even rounds where-- we have surgeons in the room, and physiatrists in the room, and radiologists in the room, and interventionists in the room helps. I think we do a better job. I think the idea of training across disciplines is important.

That goes back to those lectures we just talked about. We actually have, starting in August, our very first value-based fellow in spine and musculoskeletal medicine, which is a unique fellowship within UPMC. And it's a PM&R resident who's graduating this year. And he's going to do a fellowship in essentially advanced spine and musculoskeletal care. And he's going to work in our spine health clinics and our other experimental clinics within UPMC. But he's going to rotate with surgical colleagues of various sorts, both in neurosurgery, and orthopedics, and other fields, and rheumatology, and radiology.

And he's going to be trained across disciplines to understand how everybody else works and help them understand how he works so he can help them solve problems, and help us build collaborative systems as we go along. This fellow just happens to be a he. It doesn't have to be a he at all. But that's an example of training across disciplines, which I think helps everything. And I think the health care system really is heading towards this idea of value-based care. You look at bundles for hip and knee replacements. They're value-based structures, and they are collaborative structures.

So within the hip and knee bundle, there's one payment that covers the hospital. It covers nursing. It covers therapy. It covers anesthesia. It covers the surgeon. It covers the device. It covers everything. It's a collective issue-- it's a collective payment. And I think as the system moves towards value and starts shifting the risk of care of our patients, the outcome of our patients comes on us. And so our financial well-being is tied to the outcome of the patient we treat. We're going to need to collaborate on that.

We can do a better job together than we will do in our silos. And so if we want to think about a way to do this, one, that works for us and two, that really gets at what our patients need, we as a collection of spine providers need to be thinking and working together on this so that we can help develop structures that reward the right things, that help our patients get better, that allow us to work in ways that we need to work to help our patients do well. And that's just a few of things to think about as we went down the line a bit more on this. All right. And that is it. That is my presentation. Thank you all.