

Speaker 1:

Welcome to Optimal neuro|spine podcast, a podcast about optimizing our brain and spine in health and disease. Each episode, leading neuroscientists, neurosurgeons, educators, patients, spine care, and quality improvement experts discuss their research, experience, emerging science, surgical advances, and insights about how to optimize neurological and spine care. Now, here's your host, Dr. Max Boakye.

Dr. Maxwell Boakye:

Welcome to the Optimal neuro|spine podcast. Today, I have a distinguished guest, Dr. Steven Glassman. I'm going to be talking to him about the American Spine Registry, and what it means, what it is, what it's currently being used for, and its potential to provide evidence for spine surgery. Dr. Glassman is currently medical director at the Norton Leatherman Spine Center in Louisville, and is professor of orthopedic surgery at the University of Louisville, a past president of the Scoliosis Research Society and co-chair of the American Spine Registry. He completed his undergrad at Princeton and medical school at Columbia University in New York, where he also completed an orthopedic residency at the Columbia Presbyterian Medical Center. He followed that by a spine fellowship at the Leatherman Spine Fellowship program in Louisville, Kentucky, where he is currently the medical director.

Dr. Maxwell Boakye:

He has published extensively on clinical outcome and cost effectiveness for lumbar spine surgery. He has published on this topic in particular examining the diagnosis, specific outcomes for fusion, including work on thresholds for clinical significance. He has been an investigator in multiple previous multicenter studies, including an ongoing NIH-funded study on adult spinal deformity. In his role as the co-chair of the American Spine Registry, we'll be speaking to him about the registry, why the need for a registry, and what kinds of studies have been done with the registry, and how hospitals can join the registry. It's my real pleasure to introduce him here. Dr. Glassman, welcome.

Dr. Steven Glassman:

Thanks, so it's a pleasure to be with you.

Dr. Maxwell Boakye:

First of all, let's start with your current clinical practice. How long have you been practicing spine surgery?

Dr. Steven Glassman:

I started in 1990, so over 30 years at this point. Sounds old.

Dr. Maxwell Boakye:

No, you're still young. How did you become interested in spine outcomes research?

Dr. Steven Glassman:

I had been in Louisville probably about three or four years, and a gentleman came through named Roger Minkow. He was an ER doc from San Francisco, and he started a little company called Outcomes Research, and he had this brand new tool that had been developed, and he came to us with the proposition that if we could start to get data that represented the perspective of the patient, we could demonstrate better the value of what we were doing and go to insurers, and that they would reward us preferentially, based on this outcomes data. The tool he had was the SF-36. It was one of the first uses of the SF-36. It didn't turn out exactly how he thought, but he interested us in this idea, and we interested the hospital in supporting that acquisition for this. So very early on, we had outcomes data dating back to the early 1990s.

Dr. Maxwell Boakye:

What is a registry, and what is the need for it, and what are the problems typically, with other evidence-generating studies, like randomized clinical trials?

Dr. Steven Glassman:

There's a lot to unpack in that. I think if I go back to sort of the timeframe when we had outcomes data but it wasn't generally available in orthopedics, or neurosurgery, or spine, in around 2000, there was a lot of question about fusion, and was it good, and was there any evidence for it, and because we had data, I had the opportunity, along with a friend of mine and yours, Dan Resnick from Wisconsin, to go to CMS and to sort of advocate for our data, and while they didn't decide to stop paying for fusion, what they said to us very clearly was, "All you ever bring to us is data from tertiary centers, and that's really not what we're interested in. We're interested in knowing how these procedures perform in standard clinical practice. In every little hospital around the country, does this procedure perform? The things you do, does it work the same way as it might in a tertiary center?"

Dr. Steven Glassman:

That was one of the first things that led me to the idea of the importance of registry data, because randomized control trials have a number of issues. It's the highest quality of data, and if you have a specific question that you want to ask, and you can ask it effectively in an RCT, that's absolutely what you want to do, but for the volume of questions that are important to us, to look at how spine surgery should be performed broadly, we're never going to have the time, or the funding, or the ability to address those things with RCTs, and RCTs take a long time. By the time you perform them, and by the time you get them through publication, you're generally looking at something where the procedures were done five years ago, maybe more than that, and so much of what we do in spine has evolved, that data isn't keeping up with the rate at which we really want to know how the work we're doing is affecting our patients.

Dr. Steven Glassman:

So registries have a real value, in that they can give more broad data, looking at standard clinical practice, that they can give data at a much more rapid pace, so you can really do quality assurance and quality improvement that you're not likely to get out of RCTs in an effective way.

Dr. Maxwell Boakye:

So what is the American Spine Registry? And maybe you might mention how it came to be from the N2QOD.

Dr. Steven Glassman:

Sure. N2QOD is a national neurosurgery registry. There are a few orthopedic centers in it. We were part of it. It was largely organized neurosurgery that built this, put a lot of resources into it over about 10 years, and it was intended at first to be a broad national registry, but the reality was that the data extraction was very manpower dependent, so it was hard to scale it and leverage it, and it ended up being an effective tool in tertiary centers and centers that had manpower. There were a few private practices, but it was basically people that could supply significant manpower, so it brought really useful data, but it was harder and harder to leverage it across all of neurosurgery, which was the initial intent.

Dr. Steven Glassman:

Sort of parallel to that, AAOS, organized orthopedic surgery, developed a registry for hips and knees, and they took a different tack. The QOD was very data intensive. It collected patient-reported outcomes, which was very important for spine, and it was great in a lot of ways. AAOS created a hip and knee registry, which was much simpler but much more automated, so they only looked at survival of the implants. They looked at longevity. They looked at revision. Originally, they did no real problems data collection, although subsequently, they've done some, and this was something that was sold much more to hospitals as an administrative tool for accreditation in center of excellence programs and things along those lines.

Dr. Steven Glassman:

One of the really good features of it was they built a system that could draw the data from the EMRs in an automated fashion. So it didn't require all the manpower. It was much less expensive to run, and it also included implant data. Right now, there's 2.5 million patients in the joint registry, and there's lot-specific implant data on 2.5 million patients, right? So that's a big plus. These were two registries with very complementary capabilities and not much overlap. Orthopedics, after having put a lot of investment into that, decided, "Well, we're going to use this for a broader range of things, not just joints," and they put together a group, a registry oversight committee, and I was fortunate enough to be the person for spine. I never really thought they'd want a spine registry, because there were existing spine registries, N2QOD, NASS had a registry at that point, although it isn't really still active.

Dr. Steven Glassman:

But in any event, when they looked to expand to spine, I along with some of the neurosurgery leaders from QOD were able to convince the leadership in both orthopedics and neurosurgery that this would be much more effective as a combined effort. So after a bit of wrangling, and to everyone's surprise, we were able to bring people together and create a 50/50 partnership to run a national spine registry, ASR, using the infrastructure of the joint registry and the knowledge that had been accumulated with the N2QOD. So that was the genesis of ASR.

Dr. Maxwell Boakye:

So, the ASR is currently run by both the National Orthopedic Society and the National Neurosurgical Society?

Dr. Steven Glassman:

Yeah. It is a 50/50 proposition of AAOS and AANS.

Dr. Maxwell Boakye:

I see, so what kinds of data are you collecting? What variables, how long of a follow-up, and then how many patients do you have to date?

Dr. Steven Glassman:

Well, so the intention when we started two-and-a-half years ago was, "Okay, this is going to be straightforward. We're going to take this infrastructure and we're just going to start enrolling spine patients into this infrastructure, and it'll come along pretty easily." And what we've learned over two years is that was overly optimistic. It turns out that spine data is much more complicated than data around joint replacement, right? In joint replacement, there's essentially one diagnosis and one operation. That's a little bit of an exaggeration, but you know, ballpark, and as we all know in spine, it's complicated data. There's lots of different diagnoses, even for a person with the same problem. There's different procedures for the same thing. There's being able to keep all that straight. There's being able to assign appropriate diagnoses with CPT coding, which is difficult.

Dr. Steven Glassman:

So the build to create a pipeline from the EMR to the registry for spine has taken longer, but it's functioning now in more and more places. At this point, we have about 75,000 patients in the registry that are new ASR patients, and we are very close to being able to bring into that space the previous QOD patients, which would be another couple 100,000 patients, so we have a very good base that's building. The data that's collected is firstly the EMR data, and that's largely automated, so all the demographic data, all the CPT data, all the diagnostic data, all the comorbidity data. Anything that's in the EMR, we can pull into this, so readmissions, reoperations, complications.

Dr. Steven Glassman:

We are trying very hard to collect patient-based outcomes data. Eventually, we'll want to do that in as many patients as possible. For sites that haven't done that before, we're looking for them to start doing it in some percentage of their cases and work up to doing it more completely. So that's a work in process, but we're collecting... largely, we're collecting baseline six-month, baseline three-month, and one-year data on everyone that's enrolled in the registry. That's the goal.

Dr. Steven Glassman:

The other thing that the registry will be able to do is it's linked in an identified way to Medicare, so for any patient in the registry, we'll be able to sync their file with their Medicare file if they're Medicare eligible, and that is powerful, both because it gives us a much broader dataset on the patient, beyond what might be in their hospital's EMR, and it also gives us data on the patient if they have a subsequent intervention, or visit, or complication at a different site from the index site where they were enrolled in the registry. So it makes it much more comprehensive.

Dr. Maxwell Boakye:

Are all areas of spine surgery represented? Now, traditionally, spine surgery involves four broad areas, one is degenerative spine, and then there is two more, there is trauma, and infection, and deformity. Are all of these areas potentially going to be represented, or are you going to focus on a subset?

Dr. Steven Glassman:

Well, we've started with degenerative cervical and degenerative lumbar, and that's the patients that are being enrolled now. Our next target is going to be metastatic tumor, because we want something that's taken care of broadly across orthopedics and neurosurgery, as opposed to primary tumors, that tend to be just the tertiary centers, and that registry is in the build process, that module, and will be ready, I don't know exactly, end of this year maybe, beginning of next year, so that will come on board.

Dr. Steven Glassman:

Deformity, there is really a good... The area where there's the best registry data, it's not exactly registry, maybe you call it study group, is in substantial deformity. The ISSG really does that well, and we're not trying to duplicate data collection for complex problems like that. So I think we will see a deformity module that starts with sort of degenerative deformity, so the kind of cases that many orthopedic surgeons and neurosurgeons would do in their standard practice, you know, a 25-degree curve with stenosis, where you're really mostly treating the stenosis, but you have to treat the deformity to do a good job. Those cases will enroll in the registry in the not-too-distant future, but the big sagittal plane imbalance cases, that's not a target for us in the near term.

Dr. Maxwell Boakye:

You mentioned the hip arthroplasty has about 2.5 million patients in the registry. What kinds of knowledge was gained from this amount of patients, and do you hope

to achieve similar knowledge from the ASR registry? I mean, you've touched a little bit on how ASR is similar and also different from the joint registries, but what have you gained from the hip arthroplasty already, that might be applicable to the ASR?

Dr. Steven Glassman:

Keep in mind, the ASR grew out of a group of people who were energized, on the QOD side, energized towards research. That was the primary goal. The hip arthroplasty registry was much more organized as quality improvement and an administrative registry. Now, they are moving to use that data for research purposes, but they've been able to now look, with very large numbers, at the performance of different kinds of implants, and procedures for different kinds of arthritic problems, but this is not a registry, thus far, the joint registry, that has been used primarily for research purposes, and I think they're just really starting to do that now, so the comparison...

Dr. Steven Glassman:

As opposed to even the QOD, where there's hundreds and hundreds of papers published out of that registry, that have looked across all spectrums of degenerative spine surgery. So the goals have been very different, and I don't know that the joint registry will give us really insight into how to utilize our registry for research purposes. I think that it's more likely, in my view, that ASR will be somewhat of a guide for how the joint registry could use their data in research, because we've been much more aggressive about that.

Dr. Maxwell Boakye:

Now, the ASR, how long has it been in place?

Dr. Steven Glassman:

It's been in place for two years, but there's really only been data accumulated into the dashboard over the past six to eight months, so I don't believe that there will be... We'll do some pilot studies, to look at the data acuity, and to understand the registry better, and to start to look at what we might be able to examine. We'll do that over this year. I don't think that really the data will be robust enough and we'll have a confidence level in all the details, where we're going to start looking at broader kind of research projects, until I would say at least 2023.

Dr. Maxwell Boakye:

So it's probably too early to see papers from the ASR, but as you mentioned before, there's been a lot of papers from the QOD. Would you be able to tell us about some of the most important findings or papers that have come out of QOD, and in particular, anything that has surprised you?

Dr. Steven Glassman:

Lots of studies have been done, and they all have the advantage and disadvantage of registry studies. They have big numbers, but they don't have the granularity that you might get in a study where you could sort of touch each patient, like at a center or a

couple of centers. You know, a study that we did that surprised me a bit is we looked at patient who were decompressed only. We did it both for stenosis and for disc herniation, and we tried to look at the question of if the patient has a lot of back pain, is that back pain not well treated by decompression alone, which is sort of what people were taught for lots of years, if you had a lot of back pain, you needed fusion to address that? We demonstrated from the QOD data that actually, patients got very good relief not only of their leg symptoms but of their back pain with decompression only for a diagnosis of spinal stenosis, and for a diagnosis of disc herniation. Now, those weren't patients with spondylolisthesis or scoliosis, but just that the data shows that decompression only is actually quite effective for not only leg pain but associated back pain as well. I thought that was an interesting finding.

Dr. Steven Glassman:

We also did a study, because QOD looked at return to work. We did a study that demonstrated much better return to work after a fusion than I sort of would have anticipated in a pretty big QOD population. So, there were a number of studies out of the broad QOD data, and there are many, many more. Those are just a couple examples that I think were valuable. I think the most valuable use of that data was from a group called the CORE Study Group. It was sort of 10 or so high-enrolling centers that took their QOD data and then supplemented it by going back to the charts and to the x-rays, right? Because these registries don't have x-rays, and looking in much more detail on a specific topic, so the CORE Study Group did it mainly around spondylolisthesis. Now they're doing it around cervical myelopathy, and they add to their basic registry data, and fill in the holes for specific questions, like to look at radiographic features and things like that.

Dr. Steven Glassman:

I think that's actually the first data, that the way that the data will first come out of ASR as well, right? I don't think it's going to be big studies that the ASR does with the data analytics capabilities that the registry has. I think it will be groups who do similar kinds of cases or have similar interests, or partnerships like with something like maybe Cervical Spine Research Society, where members will be able to use their ASR data as a backbone, and then layer on top of that the more detailed data about a specific problem, that will allow them to do really high-quality studies.

Dr. Maxwell Boakye:

What should we be expecting from the evolution of ASR? Do you think that it would essentially be adopted by most practices nationwide?

Dr. Steven Glassman:

I think over the long term, it will be adopted pretty widely. I don't know about most practices. The joint registry collects about 40% of the joints done in the US. Now, that's not most, but boy, that's a big number, and I think that if we got to that number, that would be fantastic. I think that it will demonstrate a number of things. We'll see what the data shows, but I think it's going to demonstrate that the sort of standard procedures that spine surgeons feel like are good operations really help

people very substantially, and that that value is across the board of people doing things at complex centers and in small hospitals, and standard practice, I think we're going to see that the practice of spine surgery by neurosurgeons and orthopedic surgeons across the country is really very high quality overall. I think it will help people to look at their own data, through the dashboarding function, and to see what procedures work best in their hands.

Dr. Steven Glassman:

There are lots of things we do where one operation isn't definitively better than another, so as an example, for anterior work, someone may have a really good access surgeon and a lot of experience with a purely anterior approach, and another person may be good, very good at lateral approaches, which they do by whatever system they use, and I think we'll see that the differences in outcome in those patients may be more related to what you're good at than one approach is really better than another approach. I think a lot of those things, we'll see, but it'll give surgeons an opportunity to see the outcomes of their procedures, their own procedures in their patients, in relatively short order. You know, there's a little lag, but three months maybe, and to compare that to national benchmarks, and to regional benchmarks, and to a different operation in their own hands. So I think the ability to use this to practice better spine, to me, that's the most important application, if we can get to that point.

Dr. Maxwell Boakye:

So individual groups that join would have access to the benchmarks?

Dr. Steven Glassman:

Yeah, every surgeon has access to their own data. Nobody has access to your data except you, right? No data is given to any payer, insurer, regulator, that's not completely de-identified, and even in scenarios where we use this data to enroll in like quality programs, so insurance companies, in the joint space and we think in the spine space, will offer, "These surgeons can bypass pre-authorization if they meet certain standards, X, Y, and Z." Even in that scenario, if you want to be in that program, you don't have to give your data to the insurer. This registry will just certify that Dr. X meets those criteria, so it's a way to promote orthopedic surgeons and neurosurgeons, and to verify the work they're doing without having to give individual surgeons' data to payers or to insurers. It's been really built to be advocates for surgeons, but to protect their data at all costs.

Dr. Maxwell Boakye:

So you have buy-in from the national orthopedic and neurosurgery organizations. That's very powerful. You also, looks like you've got buy-in from CMS. What about the larger insurance companies, especially the private insurers? Are they supportive of this idea?

Dr. Steven Glassman:

Well, they're certainly supportive of having data, right? And they're supportive of using data to give optimal care. We may at times have different views about what optimal care means, and we'll see how that progresses over time, right? We've had discussions with some big insurers about sharing their database with us the same way CMS does, that is we don't give them data. They give us data, we give them the names and identifiers of people in their universe who are part of the registry, and they would give us the data on those patients to integrate, so that we could follow across a broader spectrum of sites of care, private patients as well as Medicare patients. We've had some interest in that. We'll see whether that really happens. I think that there's been some discussion about programs that would potentially bypass pre-authorization in certain cases, for surgeons who have a certain qualification. We've had discussions about those programs. We'll see how that goes.

Dr. Steven Glassman:

We have had the joint commission for its program for certification for excellence in spine. It used to be you just had to participate in any registry. Now you have to participate in ASR to be part of that program, so I think we're going to see this having more and more penetrance as it gets bigger and represents the bulk of registry data around spine across the country.

Dr. Maxwell Boakye:

I see, so can the data participation be used to support a center of excellence, or like Blue Cross distinction type applications?

Dr. Steven Glassman:

Yes, absolutely. There's been a lot of use, and the joint commission saying that ASR is a mandatory part of their spine center of excellence program, is the first really big step where that's been limited to ASR in terms of qualification.

Dr. Maxwell Boakye:

For hospitals that are interested in ASR, how can they join?

Dr. Steven Glassman:

They can contact the ASR staff through the website, which is americanspineregistry.org. They can contact us through if they participate in the joint registries already, it's just really an addendum to their contract to add ASR, but there's a whole infrastructure to help them with that. It's actually very inexpensive. For a hospital to enroll all of their surgeons costs \$5,000, so from a hospital-level cost, one of the things about it being automated is there's a lot of leverage, and so the costs have been kept quite low. There's an embedded cost of building the pipeline, an IT cost, that a hospital will have to put some resources into, but the carrying cost of participating is actually quite low.

Dr. Maxwell Boakye:

One of the things in spine surgery is that the outcomes are heterogeneous. I imagine the ASR would be able to shed light on the heterogeneity of spine outcomes across the country. In other words, if you take a condition like lumbar stenosis, do most centers get good results, or how wide is the variation of outcomes?

Dr. Steven Glassman:

I think that the ASR is going to have a combination of breadth and granularity that won't be perfect, but it'll be better than anything else we have. There was just this last week, an article in JAMA, talking about the heterogeneity of spine surgery and how fusion was done at very different rates in different cities, for back pain, right? But it's not at all clear what they're looking at, right? Because first of all, back pain isn't a disease. It's a symptom, and the question is, in some cities, is it being coded differently, and you're really looking at different patients? I think ASR has the potential to really improve the level of granularity, not to the level you could do if you're doing a study of a limited number of patients in your center, where you could look in depth in their chart, but orders of magnitude better than what we do at present.

Dr. Steven Glassman:

There's also, within ASR, a smart form for vanguard centers, where the surgeon fills out their diagnosis, and the specifics of what they think is being done in the procedure, that I think is going to be helpful in making us smarter and bringing us an ability to sort of bin these patients more appropriately amongst the group. I think that that's going to make our understanding of what these CPT codes really mean, and how effective they are, and how much we can utilize that CPT kind of data, which people have questioned. So there's a lot to learn. It's going to be a long time before we really get smart with this, but it's started, and it's rolling, and I think that maybe not in my lifetime or your lifetime, practicing lifetimes, but I think it will come to the point where this just adds tremendously to the quality of care across the whole country.

Dr. Maxwell Boakye:

Can you talk a little bit about predictive models, and what kinds of predictive models can be done with such a registry?

Dr. Steven Glassman:

Yeah. I'm going to say firstly, that I'm a bit of a skeptic about predictive models as we talk about them now, right? When you think about the concept of predictive models, think the stock market, or think weather, right? Where you have a million points today, and a million data points yesterday, and a million data points for the past 10 years, right? And even with all that, predictive models are good, but not at all perfect. And we do a lot of talking about predictive analytics and predictive models in spine, based on datasets that are much, much, much, much too small to really do the kind of analysis that we're talking about.

Dr. Steven Glassman:

So you know, do I think if you have 2.5 million patients in your registry, that there's some things where you can really build predictive models? Yeah, probably, but when you start looking at datasets with 1,000 patients, and then you divide it among 10 different diagnoses, and all the other variables that we know are important, right? I think our existing predictive models don't perform well because there just isn't enough data. So I do believe that someday, that will get better. I also think that we'll get ways of accumulating much more data.

Dr. Steven Glassman:

Right now, our diagnostic assessment is one exam, and a static MRI, and a static x-ray, right? And we're trying to make assessments on that. When we start having wearables and things like that, where we get much more robust data about how patients perform, and what their symptoms look like over time and with activity, we'll start to have an accumulation of data that may start to make AI, and machine learning, and predictive models more effective. So, I think predictive models right now pick out the things that we need to worry about. They're good at identifying complications that you already know are the important complications, right? But I think we ought to think of that as really just sort of the tip of where we're going, not that we're close to having that really guide our treatments effectively.

Dr. Maxwell Boakye:

So, you don't have imaging in ASR, but you cannot ignore imaging. How are you going to weave the imaging to create a deeper understanding? Is it like a group of centers can take their patients and then go back and retrieve the imaging? Is that the sort of best way to do this?

Dr. Steven Glassman:

Well, I don't know what the best way is, right? I think it'll be like Microsoft, where you have a lot of people who have good ideas, and they write all kinds of different apps for the platform, and some of those things turn out to be really good and really important, and some don't. I think that what you just described would be an obvious approach. I think it may be that someday, that analysis of the studies is automated enough that that data can be held in the registry, right? But right now, the expense is high, and we think the value is low, because if you're going to put an MRI in the registry, what cuts are you going to put in? How is it going to get read out? It's just hard to know how you're going to operationalize something that's really going to be useful. That's why we've held off on doing that.

Dr. Steven Glassman:

I think certainly for isolated projects, and insurers have expressed a big interest in this, and the FDA has expressed a big interest in this, I think layering those in different ways on top of the baseline data is the likely approach. I think the right way to do it is going to be different for different applications, for different questions, but certainly one of the major problems with administrative data is unless you have this radiographic data and this kind of information, it's just not as valuable. I agree completely with that.

Dr. Maxwell Boakye:

Steve, one final question for you. As you have mentioned, with the increased economies of scale, a lot more patients, a number of possibilities open up, with deep learning, AI, machine learning, and all that. Personally, what are some of the most compelling studies that you're looking forward to? Another way to ask is the magic wand question, which I ask every guest on my podcast. If you had a magic wand, what question or questions would you want answered with this registry? What is the most compelling questions that you would like to get answered?

Dr. Steven Glassman:

I'm not 100% sure it's the most compelling, but I think for me, one of the things the registry could do that I think would be really good for us as spine surgeons is it has a granularity of data that can look at revision differently than we look at it now, especially on the vanguard side. It allows inputting of data that differentiates what level you're working at, what's a revision, does a revision mean instrumentation? Does a revision mean just decompression? Because if you look at hips and knees, if someone has a right hip replacement and then two years later, they need a left hip replacement, nobody looks at that patient and says, "Oh, that was a failure of their right hip replacement, because now they need a left hip replacement."

Dr. Steven Glassman:

In spine, we've dug ourselves this incredibly stupid hole, where any subsequent operation in a patient we've taken care of is thought of as a failure of their first operation, and we don't have granular enough data to differentiate revision for failed decompression or failed fusion from revision from adjacent level, and I think that the registry is going to pretty rapidly be able to tell those things apart, and give us granular enough data that we can appropriately differentiate between procedures that didn't work and disease that has progressed that requires us to do something else subsequently. I think that would be great for spine surgeons.

Dr. Maxwell Boakye:

That is really awesome. That brings us to the end of the interview with Dr. Steve Glassman, Past President of the Scoliosis Research Society, and really co-chair of the ASR. Couldn't think of a better person to give us an introduction to the American Spine Registry, which is going to be really the highlight of spine surgery moving forward in the next decade. Dr. Glassman, I really want to thank you for taking the time to come on our podcast.

Dr. Steven Glassman:

It's my pleasure. I really appreciate you having me, guys.

Dr. Maxwell Boakye:

Thank you.

Speaker 1:

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