Multi-Jurisdictional Contractor Advisory Committee (CAC)/Subject Matter Expert Meeting

Thursday, February 11, 2021, 1:00 – 4:00 p.m. Central Time

Topic: Epidural interventions for pain management

Medicare Administrative Contractor (MAC) Participants

Dr. Leslie Stevens – Contractor Medical Director, Novitas Solutions and First Coast Service Options
Dr. Andrew Bloschichak – Executive Contractor Medical Director, Novitas Solutions
Dr. Marc Duerden – Contractor Medical Director, National Government Services (NGS)
Dr. Meredith Loveless – Contractor Medical Director, CGS Administrators
Dr. Neil Sandler – Contractor Medical Director, CGS Administrators
Dr. Leland Garrett – Contractor Medical Director, Palmetto GBA
Dr. Judith Volkar – Contractor Medical Director, Palmetto GBA
Dr. Robert Kettler – Contractor Medical Director, Wisconsin Physician Services (WPS)
Dr. Arthur Lurvey – Contractor Medical Director, Noridian Healthcare Solutions
Dr. Raeann Capehart – Contractor Medical Director, Noridian Healthcare Solutions
Dr. Eileen Moynihan – Contractor Medical Director, Noridian Healthcare Solutions
Amanda McGarvey – WebEx Host/Business Operations Specialist, Novitas Solutions

CAC/Subject Matter Expert Panelists:

Dr. Keith Barnhill
Dr. Roger Chou
Dr. Joshua Hirsch
Dr. Laxmaiah Manchikanti
Dr. David J. Kennedy
Dr. Michael Lankhorst
Dr. Jeffrey Petersohn
Dr. David Reece
Dr. Howard Rosner
Dr. Ben Shwachman
Dr. Deborah Tracy
Dr. Timothy Wilt

Amanda McGarvey

Mandy McGarvey, and I'll be your Webex host for today's meeting. Before we get started, I do want to take a moment to remind everyone that today's meeting is being recorded. And please, if you're not speaking, keep your phone on mute so we don't have any feedback. At this time, I'm going to go ahead and turn things over to contractor medical director representing Novitas and First Coast, Dr. Leslie Stevens. Dr. Stevens.

Dr. Leslie Stevens

Thank you, Mandy, and welcome, all, to the Multi-Jurisdictional Contractor Advisory Committee, subject matter expert meeting on the topic of epidural interventions for pain management. I'm Dr. Leslie Stevens, contractor medical director, representing both Novitas Solutions and First Coast Services Options as we host this virtual multi-jurisdictional CAC meeting. I am going to repeat some things that Mandy has said. As a reminder, Medicare administrative contractors are required to record each CAC meeting and ensure that the recording is maintained on their contract or website, in order to comply with the CMS guideline-- think somebody's got some feedback. Mandy, can you tell who needs to go on mute? I'm sorry. Okay. Thank you. As a reminder, in order to comply with the CMS guidelines as well as state recording laws and federal wiretapping laws, please be aware that Novitas Solutions, Inc. and First Coast Services Options, Inc. are recording this virtual CAC meeting. By remaining logged in and connected via webinar, you acknowledge that you have been made aware that this virtual CAC meeting is being recorded and you are consenting to the recording. If you do not consent to being recorded please disconnect from this virtual CAC meeting. Otherwise, your continued connection to this CAC virtual meeting constitutes your consent to this recording. Let me just pause for a minute. I'm getting some feedback. Mandy, could you help me locate that? Okay. Thank you. Okay.

This meeting is the second of its type in the national contractor medical director workgroup on interventional pain management practices. The national workgroup is chaired by Dr. Meredith Loveless - she's a contractor medical director from CGS - and is made up of the representative CMDs from each of the Medicare administrator contractors and include Dr. Andrew Bloschichak, he's with Novitas Solution and First Coast; Dr. Raeann Capehart from Noridian Healthcare Solutions; Dr. Marc Duerden, National Government Services; Dr. Leland Garrett from Palmetto GBA, Dr. Robert Kettler from Wisconsin Physician Services; Dr. Arthur Lurvey from Noridian Healthcare Solutions; Dr. Eileen Moynihan from Noridian Healthcare Solutions; Dr. Neil Sandler from CGS Administrators, and Judith Volkar for Palmetto GBA. You can go ahead to the next slide, I think. This meeting is an evidentiary review on epidural interventions for pain management, whereby we MACs are seeking expert opinions from our esteemed panelists regarding the quality and strength of the literature available for this topic and the applicability of these interventions in improving health outcomes for our revered Medicare beneficiary. As this review is purely clinical, we will refrain from speaking about utilizations or cost. We also want to encourage the jurisdictional CAC members across the nation attending this webinar to participate in the evidentiary review by submitting your votes and/or comments in writing to your respective MAC jurisdictions. We value your input and feedback and look forward to hearing from you.

The format of our meeting will be as follows: because we are specifically seeking expert opinion, speaking privileges are limited to the panelists and CMDs from the workgroup. We ask all speaking members to mute themselves when not providing comments. We have already asked our panel members to review a pre-distributed list of 28 questions. They were asked to vote on each question, and when applicable, to use the confidence rating scale of 1 to 5, with 1 being low confidence and 5 being high confidence. Additionally, we pre-assigned specific questions to each of our panel members in order to discuss all 28 questions in our allotted time. Dr. Marc Duerden, contractor

medical director from NGS, whose background is physical medicine and rehab and spinal cord injury, will be our moderator for the questions.

At this time, I would like to welcome our panelists and thank them for their time and willingness to share their expertise. The panel was nominated by their peers and respective societies. They are broadly represented in terms of geography, practice setting, background, and medical specialty. So now turning to our 12 expert panelists. As I call your name, please give a brief introduction of yourself and state any conflict of interest you may have. So we start first with Dr. Keith Barnhall-- I'm sorry, Barnhill. Apologies. Dr. Keith Barnhill, representing the American Association of Nurse Anesthetists. Dr. Barnhill.

[silence]

You may be on mute, Dr. Barnhill.

[silence]

Maybe I'll come back to Dr. Barnhill because he's having some difficulty with connecting. We'll go to Dr. Roger Chou. He is serving as one of our subject matter experts. He's going to introduce himself, and please state any conflict of interest that you may have. Thank you, Dr. Chou.

Dr. Roger Chou

Sure. Yeah. I'm Roger Chou. I'm [at?] Oregon Health and Science University. I'm a professor in the School of Medicine. Internal Medicine is my clinical background. I do health services research, systematic reviews, guideline development. I have led many guidelines and systematic reviews in low back pain, including interventional procedures, pain in general, addiction, and other topics along Cochrane. I'm a coordinating editor for Cochrane Back and Neck Group and their MSK group. I'm on the CDC Board of Scientific Counselors. I'm a methodologist for the World Health Organization. And my conflicts are that I have [inaudible] previous reviews that have been used for guidelines, some of which are cited in the papers here.

Dr. Leslie Stevens

Dr. Chou, could you say that out loud for the recording, please, about the conflict of interest?

Dr. Roger Chou

Yeah. It's listed there. I've [done?] reviews that have been used for prior guidelines.

Dr. Leslie Stevens

Okay. Thank you. Our next panelist is Dr. Joshua Hirsch, and he's representing the American Society of Neuroradiology. Dr. Hirsch, please go ahead.

Dr. Joshua Hirsch

Thank you, Dr. Stevens. My name is Josh Hirsch. This is my third multi-jurisdictional MedCAC, and by way of introduction, I would just compliment the MACs for putting together such a robust process in order to support our dear Medicare beneficiaries. In terms of my conflicts of interest, I consult for Medtronic, I serve on the data monitoring committee for [ALEVENT?], and I received grant support from the Neiman Health Policy Institute, none of which, I think, are irrelevant for this particular discussion we're going to have today. To Dr. Chou's point, my friend Roger Chou, I have participated

in guideline development around epidural steroids for, actually, several different organizations, so I'll announce it as a conflict as well. Thank you, Dr. Stevens.

Dr. Leslie Stevens

Okay. Great. Thank you. I'm going to circle back to Dr. Barnhill when we're able to get him on the speaker. Our next panelist is Dr. David Kennedy, representing the North American Spine Society. Dr. Kennedy, please go ahead.

Dr. David Kennedy

DJ Kennedy. I'm a professor and chair of the department of PM&R at Vanderbilt University Medical Center on Nashville, Tennessee. I've also done these before and really honored to be here to discuss this important topic. My disclosures, I've been also, like many of other panelists, actively involved in guidelines, some of which are used, and actively involved in original research focused on interventional spine therapies' efficacy and safety outcome.

Dr. Leslie Stevens

Great. Thank you, Dr. Kennedy. I think our next panelist is disconnected. Dr. Lankhorst, are you on the phone at this point?

Dr. Michael Lankhorst

I am.

Dr. Leslie Stevens

Oh, okay. Well, let me introduce you more properly, then. We're happy to have you, Dr. Michael Lankhorst, and he is representing the Nebraska CAC as a Nebraska CAC member. So go ahead, Dr. Lankhorst.

Dr. Michael Lankhorst

Hi. I'm an assistant professor at the University of Nebraska Medical Center here. It's my first CAC—

[Unknown]

No, I would need it on the computer to hear others speaking.

Oh.

Dr. Leslie Stevens

Okay. Okay. There's Dr. Barnhill, I think, coming in, but go ahead. Okay. Let's come back to Dr. Lankhorst. Okay.

Dr. Michael Lankhorst

All right. It's all right. Yeah. So this is my first CAC meeting, so thank you for inviting me. I appreciate it. I don't think I have any significant conflicts of interest other than I'm an interventional pain specialist, so I think any outcomes of the meetings may affect me in the future.

Dr. Leslie Stevens

Okay. Great. I'm going to circle back. I think we've got Dr. Barnhill. Are you able to speak now? I wanted to introduce Dr. Keith Barnhill. He's representing the American Association of Nurse Anesthetists.

[silence]

Well, I thought we had him on the line. Okay. Dr. Barnhill?

Amanda McGarvey

Dr. Barnhill, are you unable to unmute your phone or your audio conference?

[inaudible].

Dr. Leslie Stevens

Is that you, Dr. Barnhill? Okay. Now, I'm not sure if Dr. Manchikanti allowed me to introduce him with the first name of Lax, although it is Laxmaiah. I think I'm saying that right. And I think he's on the line, and he is representing the American Society of Interventional Pain Physicians. Dr. Manchikanti, are you on the line? Okay. We'll have to circle back to Dr. Manchikanti.

Okay. Our next subject matter expert is-- I'm sorry, our next panelist is Dr. Jeffrey Petersohn, and he is representing the New Jersey CAC. And if you could please introduce yourself and state any conflict of interest, Dr. Petersohn?

[silence]

Dr. Petersohn, I thought I'd seen your name up there earlier.

Amanda McGarvey

Dr. Petersohn, your line's muted. Are you able to unmute your audio conference? The little mute button to the right of your name in the panelist window.

Dr. Jeffrey Petersohn

Hello? I'm Dr. Jeff Petersohn. I'm an interventional anesthesiologist. Reformed [inaudible], formerly clinical associate professor of anesthesiology, and I serve as a board member of the New Jersey Society of Interventional Pain Physicians, and I'm also a member of the American Society of Regional Anesthesia and Pain Medicine. I appreciate the invitation to assist the esteemed members of this committee in providing the best quality of care to Medicare beneficiaries. Thank you.

Dr. Leslie Stevens

Thank you. And our next panelist is Dr. David Elliot Reece, and he's representing the American Academy of Physical Medicine and Rehab. Dr. Reece?

Dr. David Reece

Good afternoon. David Reece, AAPM&R, and chief of physical medicine, rehabilitation and pain management at Walter Reed National Military Medical Center. I've served on many, DOD clinical practice guidelines, but have no other relevant conflicts [inaudible].

Dr. Leslie Stevens

Okay. Great. Now our next panelist, Dr. Howard Rosner. He is representing the California CAC. If you could go ahead, Dr. Rosner?

Dr. Howard Rosner

Good afternoon or good morning, depending on where in the country you are. Howard Rosner. I am currently professor of anesthesiology at Cedars-Sinai Medical Center in Los Angeles and the director of our Pain Management Center. I have been involved in resident fellow education in pain medicine for the better part of 37 years, which seems pretty impossible. I've never done one of these before. I am, admittedly, a little nervous being in the company of all of these people who are incredibly talented and smart. My only conflicts of interest are I do fellowship education for Boston Scientific and Avanos.

Dr. Leslie Stevens

Thank you, Dr. Rosner. Okay. Our next panelist is Dr. Ben Shwachman, and he is also representing the California CAC. Go ahead, Dr. Shwachman.

Dr. Ben Shwachman

Yeah. I have no conflicts; I am a reformed anesthesiologist. I have been doing pain medicine, only pain medicine, for about 30 years. At one point, I was on the board of the American Academy of Pain Medicine. I was, I suppose, the founding attorney for the International Spine Intervention Society. I've also been a past president of the California Society of Anesthesiologists, and I just do pain medicine, and that's it.

Dr. Leslie Stevens

Okay. Thank you, Dr. Shwachman. Next panelist is Dr. Deborah Tracy, and she's representing the Florida CAC. Dr. Tracy?

Dr. Deborah Tracy

Good afternoon. Good afternoon. My name is Dr. Deborah Tracy. I'm board-certified anesthesiologist with fellowship and subspecialty certification in pain management by the American Board of Anesthesiology and the American Board of Interventional Pain Physicians. I've served on the Medicare Carrier Advisory Committee for First Coast Service Options since 2007, have participated in three national CACs, and my practice is 90% Medicare.

Dr. Leslie Stevens

Great. Thank you, Dr. Tracy. And our next panelist is Dr. Timothy Wilt. He is serving as a subject matter expert. Dr. Wilt, if you could please introduce yourself and state any conflict of interest?

Dr. Timothy Wilt

Hi. Thank you. My name is Timothy Wilt. I am a general internist, health services researcher, professor of medicine at the Minneapolis VA and University of Minnesota. I am the current chair of American College of Physicians Clinical Guideline Committee and author one of their guidelines related to lower back pain, and also run a couple of evidence-based practice centers both for ARC and for the VA. Those, I guess, would be my conflicts of interest since my first CAC, and thanks for the opportunity.

Dr. Leslie Stevens

Well, thank you and welcome. I'm going to go back up to-- we've still go two subject-- well, panel members that I'd like to introduce, and let's see if we've gotten past the audio challenges. Are you able to answer or introduce yourself, Dr. Barnhill, representing the American Association of Nurse Anesthetists?

[silence]

Looks like you've been disconnected as well. We're also having a problem getting in touch with Dr. Manchikanti, which is bizarre. So we have two people that are disconnected. I know that in terms of conflict of interest, Dr. Manchikanti said that he had none, and I'm not sure about Dr. Barnhill. When they join the conference later, we'll have to go over that, and I'll ask them when they're answering their questions at that point. Okay. Okay. Dr. Barnhill had no conflict of interest, and we'll have to ask them to join in.

At this point, I'd like to turn the meeting over to Dr. Marc Duerden, and hopefully, all of the other complications will get worked out with our other two important panelists. And I'm going to turn it over to Marc for the epidural interventions for pain management and the evidentiary review. Dr. Duerden?

Dr. Marc Duerden

Thank you, Dr. Stevens. So we express our appreciation again to this esteemed committee, panelists, and we just want to make a couple of quick statements, and then we'll go right in the questions. The first is, is that when you join the conversation, please state your name prior to when you speak or make a comment. I would like to encourage each of us to make sure we're speaking regarding the literature and avoid any personal opinion or anecdotal evidence. And we recognize the need for individuals to be concise, expressing that information in as few words as possible, but to be very precise as well in how they answer the questions. So just with those introductory comments, and knowing that Dr. Barnhill has our first question, we're going to move to the—

Dr. Keith Barnhill

I'm ready to go.

Dr. Marc Duerden

Oh. Dr. Barnhill?

Dr. Keith Barnhill

Yes, sir. I'm ready to go.

Dr. Leslie Stevens

Oh, all right, Dr. Barnhill. You made it.

Excellent. Sir, if you--

Excellent. Okay. If you could just introduce yourself before this particular question as well? Thank you.

Dr. Keith Barnhill

Absolutely. I apologize. Hello to everyone, and good afternoon. I'd like to thank the Multi-Jurisdictional Committee for having me. I'm Keith Barnhill, I'm a non-surgical pain management practitioner in rural Northwest Iowa. I'm also adjunct faculty at the University of Florida's Advanced Pain Management program and an adjunct faculty for the University of Iowa.

I have the first question today, so I'd like to read the question to you, and then I would like to respond very briefly. The question is, "Do you agree the clinical literature supports the following definition of radicular back pain?" And this goes on to say, "Radicular back pain equals back pain or neck pain radiating in the posterior leg that extends beyond the knee and/or the arm. Now, generally there's a loss of sensation and dermatomal pattern and/or a loss of deep tendon reflexes that suggests nerve root involvement." So that was the question, and I realize that this is actually a significant question since it pertains to almost every other question that follows. So I looked for a more comprehensive definition, and I found it in the International Association for the Study of Pain Taxonomy. Their definition states, "Pain perceived as arising in a limb or the trunk wall caused by ectopic activation of nociceptive afferent fibers in a spinal nerve or its roots or other neuropathic mechanisms. The pain is lancinating in quality and travels along a narrow band. It may be episodic, recurrent, or paroxysmal according to the causative lesion or any superimposed aggravating factors." So this is the latest from the ISAP on their 2021 website. In this definition, radicular pain is identified by the axons being stimulated along a specific course or nerve root, and not only by the peripheral site of stimulation. Key points to the ISAP definition are the presence of symptom-related or pain distribution and sign-related neurological deficits.

In general, the use of the term radicular pain in the literature is not well-defined. A systemic review of 77 cases published by the European Journal of Pain evaluated multiple studies to determine if there was consistency in the use of the terms used to describe the radiating pain. Results: no consistency was found, and this is based on Lin and colleagues in 2013. They also emphasized the need to standardize the term radicular pain to clarify identity-specific study populations, prevent miscommunication, and to facilitate comparisons across research trials. I'm going to cite a few trials. It's very brief. Most studies used the term sciatica, radicular pain, radiculopathy, radicular syndrome, nerve root pain, and nerve entrapment for generalized radiating pain in the leg. Other studies weren't consistent, including signs such as neurological deficits in the imaging findings. Now, in 40% of the studies, two or more descriptive terms were used. I'm talking about the Lin study, 2013. In order to establish eligibility criteria for their study population, 48 studies provided additional descriptions or definitions of radiating leg pain or symptoms. However, there was consensus across these studies, and 26 of the 28 studies reviewed described disc herniation and/or nerve root compression as the underlying mechanism. Nine studies described radiating leg pain as pain below the knee that can be accompanied by nerve root tension or sensory motor or reflexive changes. Now finally, other studies listed pain radiating from the back into the leg following a dermatome as radicular pain or radiating pain often associated with numbness or radiating pain with abnormal sensation along the sciatic nerve. That's my question and response.

Dr. Marc Duerden

Thank you, Dr. Barnhill. Is there anyone else that has any other-- and sorry, anything else to add? Hearing none, we'll move to Dr. Chou. And your second question, and I forgot to—

Dr. Deborah Tracy

This is Dr. Tracy. I'm sorry, I was on mute. I didn't realize it. I would just like to say, in my 15 years in developing LCDs with First Coast, one thing I learned is keeping it simple is the best route of providing an LCD so that doctors understand it. Thank you.

Dr. Marc Duerden

Thanks, Dr. Tracy.

Dr. Ben Shwachman

This is Dr. Shwachman. I think the statement I have in front of me, "Radicular pain is nerve root pain radiating from the affected spinal segment and a distribution concordant with the known distribution of the nerve root," is, in keeping with Dr. Tracy's statement, very simple, and I believe that's consistent with what we deal with. This is on the material you sent us.

Dr. Marc Duerden

Yes. Thank you, sir. Okay. Dr. Chou, can you take us to the second question, please?

Dr. Roger Chou

Sure. So I'll repeat the question first. It's, "What is your level of confidence that the evidence supports that an epidural steroid injection should be used for radicular pain?" I'm going to try to answer this briefly. It's a little bit complicated because it depends a little bit with regard to what timeframe you're talking about in terms of the outcomes and benefits, how big the benefits are that you would consider to be clinically relevant, which outcomes you're looking at - pain versus function versus risk for surgery, for example - and then what actual condition is causing the radiculopathy, as a number of conditions can result in radiculopathy. Most of the evidence, of course, is for radiculopathy due to a herniated disc. We and others have reviewed this evidence. There's quite a few trials, I think around 20 or so, maybe more than that. I think the evidence is pretty clear that they're short-term benefits versus placebo or sham injections or sham procedures. By short-term, we mean several weeks. Those benefits dissipate with longer-term follow-up. The benefits appear to be relatively small, averaging about 1 point on a 10-point pain scale versus sham or placebo. For function, similar. And for surgery, we see some slight decrease in the risk of surgery short-term. There don't seem to be a lot of harms associated, at least in the randomized trials, so we've all seen the reports of serious infections and whatnot.

The data's pretty robust. You can look at the data. You can cut up the trials in any number of ways by route of administration-- by the approach, I mean - transforaminal versus interlaminar versus caudal - by how long the symptoms have been present, by use of imaging guidance or not, by what type of placebo was used. Results really don't change. Again, our review and numerous others have shown similar findings, like the recent Cochrane Review and others. So that's my summary for the evidence for this question.

Dr. Marc Duerden

Thank you, Dr. Chou. Are there any other--? Okay. Yup.

Dr. Joshua Hirsch

Okay. Yes Marc, this is Josh Hirsch. Hi, Roger.

Dr. Roger Chou

Hi, Josh.

Dr. Joshua Hirsch

Good to hear your voice. Just a quick clarification for the group that may not be as familiar with the literature. Is it fair to say that when you talk about placebo or sham, you are talking about the injection of lidocaine into the epidural space?

Dr. Roger Chou

Well, the randomized trials, many of them do use epidural lidocaine. Some of them use epidural saline without lidocaine. Some of them use a intermuscular injection, so they do an injection into a muscle, not into the epidural space at all. We and others, again, have analyzed by each of these comparators and, again, the results are pretty similar. They don't change very much depending on what control you're using. And actually, Mark Bicket, I believe, did a systematic review where he showed that the benefits were actually-- where they compared whether it was an epidural placebo versus a non-epidural placebo. And I believe with the non-epidural placebo, the benefits were actually smaller.

Dr. Laxmaiah Manchikanti

This is Dr. Manchikanti. Can you hear me now? Can anybody hear me?

Dr. Marc Duerden

Yes, sir.

Dr. Leslie Stevens

Yes. Yes. Thank you, Dr. Manchikanti. Yes. We can hear you, Dr. Manchikanti.

Dr. Deborah Tracy

Yes, we can hear you now.

Dr. Laxmaiah Manchikanti

Thank you. Thank you. Okay. This is Dr. Manchikanti. I do not have any conflicts of interest except that participated in the randomized control trials and [inaudible] up the guidelines. The issue with Dr. Chou's presentation is that he's converting local anesthetic into placebo. Shanthanna [inaudible] has

done a extensive review recently and showed that there's no difference between local anesthetics and steroids. Steroids only provide a short-term additional relief. So local anesthetic is not a placebo. We have done two systematic reviews looking at sodium chloride solution and steroids. Sodium chloride solution injected into their epidural space also provided some relief, and steroids alone also provided some relief. The best relief comes from either local anesthetic alone, lidocaine, and now there are studies showing bupivicaine also or a combination of lidocaine with the steroids. So the whole concept is wrong. In addition, these are all active-controlled trials, so you really cannot use the conventional dual-arm analysis and say that since there is no significant difference between two groups, they're not effective. So to find out that, you have to do a single-arm analysis and see if each modality is effective or not. So obviously, the three studies Dr. Chou was quoting, one is themselves. We wrote a comparative analysis and published it, then Pinto and Alvera, they're all sort of going on a wrong concept stating that steroids are the effective ingredient, and they are not using a single-arm analysis that can work in all of them into placebo-controlled trials from active control. So it is an inappropriate analysis leading to inappropriate conclusions and which may unnecessarily impede patient access to the treatments. Thank you.

Dr. Roger Chou

So this is Roger. I'm going to respond to this. So I don't agree with this analysis whatsoever. As I said, we've looked at the different placebos, and the results are actually quite similar Dr. Mark Bicket also did analysis and found similar findings, and it's [inaudible] I think most people who work in this area—

Dr. Marc Duerden

So, Dr. Manchikanti?

Dr. Roger Chou

Sorry, this is Roger.

Dr. Marc Duerden

Sorry, Roger. Go ahead and finish. I'm sorry. I thought you were being interrupted.

Dr. Roger Chou

No. And I'll just say that I don't agree with the idea that you abandon randomized trials to look at interventions of pain treatments. If you did that, then we would say that opioids were incredibly effective for pain because you see huge benefits when you look at uncontrolled studies. So we don't agree with that. The Cochrane Review doesn't agree with it. Other reviews don't agree with it, either.

Dr. David Kennedy

This is David Kennedy [crosstalk]—

Dr. Laxmaiah Manchikanti

So can I comment on that again, Dr. Duerden?

Dr. Marc Duerden

Yes. Just a minute. Let's have a second comment come in, please. And I heard somebody else. And introduce your name, please.

Dr. David Kennedy

This is David Kennedy. I was going to comment on a different issue, so if Dr. Manchikanti wants to re-address that, then I'm happy to defer to him and then come back.

Dr. Marc Duerden

Excellent. Thank you. Dr. Manchikanti?

Dr. Laxmaiah Manchikanti

I just wanted to say that-- I wanted to say that the different placebos have a different response. Sodium chloride solution is different when you inject outside, the same way lidocaine is different outside the epidural space. When you put in a active structure in an inactive ingredient, that is going to produce some relief, the same thing even dextrose can cause some relief. So we can't compare all these placebos and cannot convert local anesthetic into placebos, and we really cannot do real placebo studies in the United States. Above all, we are not abandoning the randomized control trials; we are performing active-control trials, so they should be analyzed as active-control trials. So you can't take a dual-arm analysis conventionally and say that both are equal, so neither one works. Instead of that, you should have said both are equal, so both work. That is the problem. So this can be resolved by doing a single-arm analysis, which we have performed on many occasions. Thank you.

Dr. Marc Duerden

So I'd like to ask the panel. Is there anybody trying to do a crossover study?

Dr. Timothy Wilt

Hi. This is Tim Wilt. I would just say a couple of things. A crossover study would not be the appropriate design for such a study. Crossover studies are not good where there is either a treatment or a period of facts, so that would be really-- this would not be the kind of condition where you would do a crossover trial. You would essentially only have the first phase of that that you can appropriately analyze. I am not a subject matter expert vis-à-vis the injection of it or, to be honest, the content prior to coming into this about placebo versus non-placebo, though I've looked over a lot of these data. I would just like to comment on the potential role of single-arm analysis as a evidence review for the past 25 years for the [inaudible], etc. That would be considered methodologically flawed to make conclusions on essentially pre-post analysis on a single-arm study, and there would be very low confidence in the effectiveness of an intervention just based on that. So I'll just leave it at that level.

Dr. Marc Duerden

Okay. Thank you. So we've heard from Dr. Chou and Dr. Manchikanti. And David, yeah, go ahead.

Dr. David Kennedy

[crosstalk]-- yup.

So I wanted to make a comment regarding the notion of short duration of pain relief. I hear this fairly often, and unfortunately, it is somewhat misguided. To understand the effect of something, you have to know the natural history of the underlying disease that you are treating. Different causes of radiculopathy have different natural histories. Some of them are chronic conditions. Some of them are acute that we do expect to resolve fairly quickly that, for some reason, do not. So the goal, in some patients, of doing an injection is to resolve a painful condition in a person and not manage them with repeat injections, and we'll get to this later in some of the other questions. But the analogy here-- really, I think a good analogy would be to take somebody post-surgery that is having post-surgical pain or post a broken bone and studying them at two weeks and saying, "Well, your treatment is working. Your anesthetics, your opioids, your whatever is working," but if we follow them up six months later when they're resolved, there's no real benefit. That's a fundamental lack of understanding of the natural history. I will admit, most of the studies that are done to date are done on people with more chronic conditions. That's the nature of the studies and the groups that can do them. That being said, when we do have good studies that are done on acute conditions, the data shows a long-term resolution of pain regardless of-- kind of if you can get them over it is the goal here. So I think that to lump all causes here under a short duration is a real disservice to the patients we're trying to treat.

Dr. Roger Chou

Can I respond to that? This is Roger.

Dr. Marc Duerden

Okay. Roger, please.

Dr. Roger Chou

So yeah. We're not applying a value judgement. I mean, these longer-tone outcomes are just whatever the differences are. If the importance that the panel and clinicians and patients put are on short-term benefits, that's fine. All we're saying is that the benefits are observed in the first few weeks, and we don't see differences later. We see this with a lot of things, like surgeries or herniated discs, for example, and other procedures. So it's not a value judgement; it's just describing what the trials show, so.

Dr. David Kennedy

Correct. And I agree with that. I mean, I think that that is a valuable statement to make. I just think that most people misconstrue those results to say they only offer short-term relief of pain. That's a slightly different benefit than saying at six months, everyone's the same, regardless of what treatment you've gone under, is different than saying this only works for a few weeks.

Dr. Marc Duerden

And the last commenter was Dr. Kennedy. Thank you. Dr. Chou, did you have a final statement you wanted to make? And then I'm going to move to the third question.

Dr. Roger Chou

No, not really. I mean, I guess just the placebo question, like I say, you get the same results if you look at non-lidocaine placebos. We've done that analysis and we have it in our papers, and Mark Bicket has done that analysis, and so have other people. And this idea that lidocaine injections are therapeutic intervention, that's not supported by anything that I know because nobody can do that and get paid for it. People do not do lidocaine injections therapeutically for herniated discs. So wherever that idea's coming from, it's quite unclear to me.

Dr. Marc Duerden

So then—

Dr. Laxmaiah Manchikanti

This is Dr. Manchikanti. Can I make a last comment, please?

Dr. Marc Duerden

Certainly.

Dr. Laxmaiah Manchikanti

Okay. Again, this is all misconceptions. Some of these are-- as Dr. Kennedy has said, it all depends on the condition. If we are dealing with chronic pain here and this is a chronic condition, has not responded to the [inaudible] management, has not responded to medication therapy, and sometimes even surgery. So it is a ongoing, non-susceptive phenomenon. We can't expect an epidural injection to provide the same relief as the surgery, and even though we are repeating [inaudible] on surgical patients. So it is important to understand that when pain returns, you can repeat the injection. That's why LCDs are there, which let you repeat the injections. Even though we are out of that pre-epidural injection phenomenon, we should be able to repeat them. And I'm not sure how we can make Dr. Chou understand this philosophy, but he's quoting the study of [crosstalk]—

Dr. Marc Duerden

[Right?]. This is not about trying to have any individual understand. This is only just addressing the literature.

Dr. Laxmaiah Manchikanti

Right. So methodologically, it may be great, but practically, clinically, it is not applicable. Like Shanthanna did-- it is not [Dr. Him?] or not me; Shanthanna is a different person. He did this extensive review and showed that if you want to use steroids in a patient other than local anesthetic, you really have to think about. Thank you.

Dr. Marc Duerden

Thank you. Dr. Chou, did you want to have finalized kind of word on this?

Dr. Roger Chou

I don't think we need to keep beating this into the ground anymore. Obviously, they're all just randomized trials, were just designed by people who wanted to show that whether epidural steroids worked. They selected their sham procedures and control conditions accordingly. These aren't done by people who are trying to disprove epidural steroids; they're done by people who are interventional physicians who are trying to show that epidural steroids work. And I'll just say, again, we found that there is-- the conclusions are that there are short-term benefits. We've never said otherwise. Our systematic review does not say otherwise. I'm actually not really sure where some of this-- where some of this discussion is coming from. We've never claimed that there was no benefit. So again, I'll just reiterate what our findings were that there are short-term benefits associated with epidural steroids for radiculopathy due to herniated discs, and the benefits, on average, are relatively small, but they're certainly present.

Dr. Marc Duerden

I'd like to thank Dr. Chou, Dr. Kennedy, and Dr. Manchikanti for that robust discussion. We're going to move to question number three now and turn the time over to Dr. Hirsch. Would you like to read your question and answer it, please?

Dr. Joshua Hirsch

Yes, please. And I think number three will be a more straightforward question than number two. "Do you agree that evidence supports that," in quotes, "'radicular pain should be concordant with the radiologist's interpretation of an advanced diagnostic imaging study, for example, MRI or a CT, of the spine, demonstrating compression of the involved named spinal nerve route or routes?' Score 1 to 5." In brief, the literature is relatively limited, unlike the prior question, where there's extensive literature. I reviewed studies dating back to the early 2000's up to one in 2019 published in The Spine Journal. As well, I reviewed multiple societal guidelines. What I would say is that there is a problem in answering this question. An initial advance imaging study is important to rule out certain types of [inaudible] that would, for example, include tumor infection. So if the question were phrased, "Should an initial scan be obtained?" I would score it a maximal value of five.

As to whether specific anatomic cartilage should be required in order to perform the ESI, I think the answer is more nuanced, and I'll briefly describe why. A supine advanced imaging study represents a static image in a dynamic process of pain, but differently, the disc and other structures are dynamic just like pain, and the supine image might fail to demonstrate compressive etiology when it actually exists, just in a different position. Technically, there are other causes of pain, for example, chemical radiculitis, that have been well described and would be helped by epidural injections. In those cases, you might not see a mechanical compression. Bearing the above in mind, pre-procedure imaging assessment of the posterior epidural space isn't [inaudible] to determine that there is sufficient room at the target segmental level to allow safe needle placement, and in addition, the patient who has a clinical indication based on history and physical exam might have their level changed based on an advanced imaging study. MRI could also lead someone away from ESI and towards a different treatment and would reveal anatomic features like central and neural foraminal stenosis that can alter the approached or perceived level of procedural difficulty. In summary, I would grade the answer as a 5 or even 5 plus if the question were whether a study should be obtained prior to intervention, but I would take a much more neutral position and give an answer of 3 for whether the injections require a specific imaging correlate of mechanical compression. I thank you.

Dr. Ben Shwachman

This is Dr. Shwachman.

Dr. Marc Duerden

Thank you, Doctor.

Dr. Ben Shwachman

I think he summed it up very well because I had some concerns if this statement is adopted. There certainly is, as Dr. Hirsch said, a chemical nature to this as well as a mechanical nature, and ordering an MRI before every one of these will markedly jack costs, and I think that's inappropriate. Certainly, MRIs are necessary and should be done in some of these cases, and based on the MRI, different approaches may be taken. And I would point out that Dr. April, who I'm sure all of you know, always used to say to me, "You don't need pinch to hurt." He'd point out that he had his gout, and it hurt like stink, and he said no one was pinching his toe. So you don't need a pinch in order to hurt. Finally, as a lawyer, I will tell you, don't ever use should because no one knows what it means. It's either may or shall. Thank you.

Dr. Jeffrey Petersohn

This is Dr. Petersohn. I'd like to support some of what Dr. Hirsch is saying, but my concern here is for the wording, just on a radiologist's interpretation. There are a number of articles in the literature which have looked at the agreement of the report provided by the radiologist compared with either a second radiologist or a neurosurgeon or an orthopedic spine surgeon, and there are discrepancies ranging from approximately 22 to 35 percent. This significant discrepancy is so large that I do not believe, in this day and age, it is appropriate to insist that a radiologist's interpretation is somehow superior to an interventional pain physician's interpretation, and, in fact, the surgeons have become so frustrated with the variability in the integrity and detail of the readings that as part of their formal training programs, they have insisted that they have separate privileges to allow them to interpret the diagnostic imaging studies, and I believe that the insistence on the term radiologist should be removed from this statement.

Dr. Ben Shwachman

This is Dr. Shwachman.

Dr. Deborah Tracy

This is—

Dr. Ben Shwachman

I'll say one last thing about this, and that is sums up all that I've heard so far, sums up with the statement made by Dr. Warren Cole, who was the chief of surgery before some of you were born at the University of Illinois. When you pointed up to him the dissident between the patient's findings, the findings on examination, and the findings on X-ray, Dr. Cole would sum it all up by just saying, "Doctor, do you treat patients, or do you treat X-rays?"

Dr. Deborah Tracy

This is Dr. Tracy.

Dr. Marc Duerden

And we'll end on that—

Dr. Deborah Tracy

I would like to comment on-- the doctor prior to Dr. Schwan was-- I didn't get the name, but I would like to agree with him. I have a very hard time and a very wide range of diagnostic interpretations, which has forced me to do independent interpretations all the time. I mean, we have neurosurgery here. We can all look at a film and agree and disagree with the radiology report. And in some cases, it's gone as far as mid-thoracic compression fracture. Well, acute mid-thoracic, well, what does that mean? Where is it? So I would have to agree that there's a wide range of styles and types and depth of interpretation, and that we shouldn't base anything on one thing but a conglomerate of things. Thank you.

Dr. Marc Duerden

Thank you.

Dr. Joshua Hirsch

And [crosstalk], Marc, I think that's probably the final comment. This is Dr. Hirsch again. I would just point out to all who are listening, I had no role in writing this question. And as the president of the American Society of Neuroradiology and American Society of Spine Radiology, I take exception to some of the comments, not the ones about the quality of multi-disciplinary review, but rather the integrity, etc., that was brought up by Dr. Petersohn. I don't really know that that has any role in this discussion. Bearing that in mind, I think it's an open question as to whether it should be specifically requiring interpretation or something that is just present. Again, as the only radiologist on the panel, I thought it was important to state that. Thank you.

Dr. Marc Duerden

And because of the time, and if we need to circle back to some things at the end, we can, but here I'd like to move to question number four. And Dr. Manchikanti, this is a long one, so we're going to specifically request concise and precise. Go ahead, sir.

Dr. Laxmaiah Manchikanti

Thank you, Dr. Durden. This is Dr. Manchikanti. Again, I didn't have my introduction, so I will go ahead and do that now. I'm an anesthesiologist with sub-specialty board certification in pain medicine, practicing interventional pain management since early 1980's in Paducah, Kentucky, including Medicare patients. I'm the medical director of multiple centers. I'm also a clinical professor of anesthesiology at the University of Louisville and Louisiana State University. I have published over 600 manuscripts and 12 books; more specifically, I have published extensively on epidural interventions with 16 randomize control trials, with the inclusion of Medicare population, multiple systematic reviews, and guidelines. I have served on the CAC of NGS and now serving on CAC of CGS. I am a former member of MCAC. I have participated in the preparation of the [inaudible] CD for

intervention and techniques prepared by NGS. I also serve as chairman of the board and chief executive officer of the American Society of Interventional Pain Physicians.

So now coming to the question, "Rate your confidence in the evidence provided to support the use of epidural steroid injections for the following conditions," there are 18 conditions listed. I will try to be as concise as possible. I will provide the written information later on. The first condition is axial discogenic pain. There have been three relevant high-quality randomized control trials asserting the axial discogenic pain. They identified discogenic pain with clinical symptomatology, MRI findings after ruling out [inaudible] joint pain. These include caudal, lumbar interlaminar, and [inaudible] interlaminar, with 120 patients in each group. They assessed the outcomes after two years. They were all active control trials by Manchikanti et al. These authors [inaudible] overall response from all the patients enrolled and also in those patients who are responsive to the treatment after two procedures separately. They assessed 50% or greater pain relief with improvement. The response rates were 56 to 77 percent with local anesthetic and 67% to 68% with steroids when you considered all the patients. However, if you considered only the responsive patients, it was higher: 78% to 84% with local anesthetic alone, and 71% to 85% with local anesthetic and steroids.

For this, my confidence level is poor. Lumbar-centered spinal stenosis, it can't be studied by caudal epidural injections, interlaminar epidural injections, and transforaminal epidural injections. By two relevant high-quality randomized trials and one moderate quality randomizer trial, Manchikanti et al. published caudal epidural and lumbar interlaminar epidural injections in lumbar-centered spinal stenosis. They used the same protocol as [inaudible] and followed them for two years. The results: quality results were shown in 54% and 62% with local anesthetic and steroids with caudal, but as with lumbar interlaminar epidural, they were higher: 77% to 67%. In contrast, Friedly et al., with the inclusion of 282 patients in the interlaminar group and 118 patients in the transforaminal group, performed a randomized trial for six weeks. The study was short term with multiple issues with the design as well as assessment. Overall, they showed transforaminal and interlaminar were equal in their response. However, at three-week follow-up, there was significant improvement with functional status and leg pain with interlaminar approach. My confidence level for this is, for caudal and lumbar interlaminar, is 3 and 4, whereas transforaminal is 3. Caudal and lumbar interlaminar is 4 and transforaminal is 3. On average, it is about 3.5.

Foraminal stenosis is often associated with other types of stenosis, disc herniation, etc. There was only one study which showed 12-month results with bupivacaine alone or bupivacaine with steroids. Again, they didn't show any difference between either bupivacaine and bupivacaine with steroids, but they were effective. Confidence level is 3. Subarticular stenosis, there is no confidence level available. Non-specific blowback pain, my confidence level is 0. Post-laminectomy syndrome, this has been studied. There is one high-quality randomized control trial, again, studied by us with 140 patients. They showed significant improvement in 53% of the patients in the entire group with local anesthetic alone and 59% with steroids at the end of the one year. However, when the responsive group was considered, relief was 70% with guidance with lidocaine alone and 75% with lidocaine with steroids. Similarly, this was found in cervical post-laminectomy syndrome with interlaminar epidural injections, with 69% with the local anesthetic and steroids, but with local anesthetic alone, it was 74%. If you took only the responsive patients, it was higher. My confidence level here is 4. Non-organic back pain, my confidence level is 0. Widespread diffused pain, my confidence level is 0. Complex regional pain syndrome, we often do epidural injections, however, there is not much literature, so confidence level is 2.5.

Postherpetic neuralgia and acute herpes zoster, my confidence level is 2.5. Hematic neuropathy of the spinal nerve roots, my confidence level is 1. In fact, [inaudible] and severe pain secondary to diabetic or metabolic neuropathy and pain of advanced stage of cancer, my confidence level is 2. [inaudible] Cervicogenic headache, my confidence level is 2. Cervicobrachialgia, this is a little bit more important and has more studies. This is the Cervicobrachialgia [inaudible] is either due to disc herniation or spinal stenosis. For the cervical disc herniation, there are two different high-quality and

one moderate-quality randomized control trials we identified. One study by Manchikanti et al. showed 120 patients with disc herniation or radiculopathy. One year follow, they showed an overall patient population, 72% with local anesthetic improvement, 68% with local anesthetic and steroids. In the patients who responded to the first injection, it was 77% with local anesthetic and 82% with steroids. There is also another study by McCormick. They looked at interlaminar epidural injection in 40 patients and a targeted cervical interlaminar epidural injection in 36 patients. They showed equal response for both of them. Cohen et al. looked at interlaminar epidural injection. They showed that if you give the patients gabapentin, they'll do better. We also studied cervical spinal stenosis and showing the response rate of 73% with local anesthetic alone and 70% with local anesthetic and steroids. So overall, my confidence level for disc herniation is 5, for stenosis is 4, on average, 4.5. For [inaudible], my confidence level is 0. Epidural lipomatosis, my confidence level is 2. Thank you. Sorry for taking so long.

Dr. Marc Duerden

Dr. Manchikanti, I appreciate that concise approach that you took. That was very well done. We would now like to open up the floor for any other of the experts to cite any additional literature that you didn't see or hear cited by Dr. Manchikanti.

Dr. Timothy Wilt

Hi. This is Tim. I'm not going to specifically cite any other recommendations, but I guess in listening to the presentation, what I typically heard were response rates between the epidural steroid and the comparator control group that was small. There were typically 3 to 5 percent difference. So I was struck by the times that there was a confidence rating of extremely confident when our question at hand is about the use of epidural steroid injections. And in my reading of what the information presented it and as that was presented there, it doesn't seem to rise to that level.

Dr. Marc Duerden

Any additional comments?

Dr. Roger Chou

Yeah, this is Roger. This is Roger Chou. And particularly related to spinal stenosis, I mean, I think the overall assessment from Dr. Manchikanti was, for most of these conditions, there's not a lot of evidence, which I would agree with. Spinal stenosis is the one that seemed to have more confidence from his assessment. I'll just say the Friedly trial, there's different opinions upon it. From a methodological standpoint, I think it's a pretty well-done trial. Dr. Kennedy here was a co-author, I believe. It really doesn't show much difference between epidural steroids versus the local anesthetic epidural in terms of benefits. There's some small benefit that's short term, but not a longer-term follow-up. I think that there are some questions about if we think the steroids are therapeutic, and I assume that that's the case because we're talking about doing steroid injections, what inflammation are you treating with what's usually a chronic, degenerative condition. So I think the rationale of doing them is also something to at least consider.

Dr. David Kennedy

This is Dr. Kennedy. I just want to make one comment as a caveat to [inaudible]. I think that that is a small population that is hard to do studies on. The studies to date have focused on facet synovial

cysts, aspiration, or rupture, but a good number of those studies actually did include a concurrent epidural with that. [Lutsidal?] did a really nice study showing that, and the overall results are about 50% of those people are surgically spared. Whether that is a facet synovial cyst targeting or the epidural or the combination of both, it is hard to say, but I think that is a caveat that needs to be made.

Dr. Deborah Tracy

This is Dr. Tracy. I would like to agree with that, Dr. Kennedy. I've even been in that situation. Thank you.

Dr. Jeffrey Petersohn

This is Dr. Petersohn. I'd like to state my agreement with regard to the synovial cysts with Dr. Tracey and Dr. Kennedy's opinions. I respectfully disagree with Dr. Chou. Dr. Friedly's study is amongst the least useful in predicting response to steroid injections because of the [heterogenous?] techniques that were employed. And although four of the first five authors were all statisticians, I do not believe that this makes this a reliable or generalizable clinical study. Thank you.

Dr. Laxmaiah Manchikanti

This is Dr. Manchikanti. Can I comment, finally? Last comment.

Dr. Marc Duerden

Yes, sir. We'll give you last word. Yes, sir.

Dr. Laxmaiah Manchikanti

Okay. Again, this is goes back to the same philosophical differences: is it the steroid alone, or is it the local anesthetic alone, or both together? Until we resolve that, methodologically, they are totally different. Again, we have seen difference of 80%, 84%, 78%, 80%. In some cases, local anesthetic was better than the local anesthetic with steroids. Just because there is no difference between two techniques, we can't say that they don't work. We have to say both will work, so that is the practical, clinical application versus a methodological academic application. Thank you.

Dr. Timothy Wilt

Hi, this is Tim. I just want to comment on a prior comment. I just don't understand the comment about the authors being statisticians. That's not how to critically approach an article; it's to look at the design and the data as presented. They also looked at effects across different procedures and as best as possible by conditions. So I guess if there's concerns about the outcomes, it's to look at the data rather than the training of the authors.

Dr. Jeffrey Petersohn

With all due respect, the issue about that study is that the statistical design was very good, but the notion that you can collect a variety of heterogenous techniques and an inconsistent approach to the clinical addressing of the variety of clinical conditions and then get statistically useful and generalizable information out of that, I believe that this is simply a very poor-quality study because of

the way in which the study was done and the way the patients were selected for treatment. The study combines apples and oranges in ways that simply cannot be interpreted with the limited data provided in the publication.

Dr. Roger Chou

This is Roger. I just need to respond to this. So first of all, I'll just say this: I would invite Dr. Kennedy if he wishes to comment, like I said, he was a co-author on this trial, but they analyzed these factors, and that was part of the design was to look at different techniques and they analyzed them separately, and the results look very similar. This is, in my opinion, not a valid criticism. It's a big study, and you do these-- and this is one of the questions was what's the best technique, and so they looked at different techniques. I don't see why you would criticize a study for doing that. And the other thing I'll say is if you're going to criticize this study for enrolling heterogeneous population, you have to pretty much criticize every study that's done on epidural steroids for either spinal stenosis or radiculopathy because they all include heterogeneous populations, and many of them have used variability in techniques and they have other issues as well. You can't single out this study and say it's the worst. I just don't agree with that at all.

Dr. David Kennedy

Hello, this is Dr. Kennedy. I will follow up and echo and agree that I think if you are criticizing the last study, we do have to criticize the majority of studies on spinal stenosis and radicular pain for heterogeneity. The majority of studies that do have a heterogeneous population, the results are not that great. This is in contrast to studies that do get very specific in their inclusion-exclusion criteria and limit it to a single diagnosis such as herniated nucleus pulposus resulting in lumbar radiculopathy, which have fairly divergent results. I think this combined does result in a watered-down effect where we are throwing the baby out with the bathwater because we are using heterogeneity. So I don't think the Friedly study was an outlier on that perspective; I think that is rather concordant with the literature. And the main criteria for the Friedly study was radiographic spinal stenosis with [inaudible] leg pain, which could be a number of diagnoses coming through. The interesting thing is in the long-term outcomes from that study, the only really statistically significant findings were patients that got steroids were more satisfied. We don't know why. Maybe that's a systemic effect. Maybe there's something else going on. And patients that were initially randomized to corticosteroids were less likely, in a blinded fashion, to want to cross over to the other medication being lidocaine. That very well might be because they got a single injection and they felt, "This is terrible. I don't want to undergo it," but when they ask them why did they cross over, 93% said they did it because of lack of effectiveness. This is a real-world outcome showing that people that got lidocaine voted with their feet to cross over more prominently to get something else than people that got corticosteroid. So there is something there. I think this population is very challenging to treat and very challenging to diagnose, and we are lacking a really well-done study on spinal stenosis.

Dr. Marc Duerden

Thank you, Dr. Kennedy. We'll have to move on to the next question, which is actually yours, Dr. Kennedy. So I'd like you to take question number five.

Dr. David Kennedy

Sure. So, "What level of confidence do you have [to?] evidence supports a period of conservative management prior to treatment with an epidural injection?" Generally, most studies to date have

required a four- to six-week period trial of conservative care. This really appears to be based upon the proposed natural history of spine pathology combined with the risks and cost of an associated procedure rather than the evidence that conservative care works well. Most of the [inaudible] conservative care to date actually fail to [inaudible] patients reaching an NSAID, as an example. Given the [inaudible] literature and this frequent inclusion, I do think that a trial of conservative care is generally warranted. However, given there is pretty strong evidence for lumbar radiculopathy, especially due to herniated nucleus pulposus, especially in reference to the earlier questions when we had a clean study on this, the evidence is very strong. Many would argue that an injection for those in moderate to severe pain is very reasonable given the lack of strong evidence for other treatments combined with a potential risk in these treatments that are commonly offered such as opioids.

Dr. Marc Duerden

I'll open the floor to other panelists. Thank you, Dr. Kennedy.

Dr. Roger Chou

This is Roger. I'll just generally agree with Dr. Kennedy. I'll just say that we tried to look at duration of symptoms in the trials of epidural steroids. The vast majority wait until people have symptoms for at least 6 weeks. We do try to look to see if there's any difference in effects based on people with more acute versus less acute, and you don't really see any effects, but the estimates are pretty imprecise. There's not a whole lot of data to go on there. But most of these studies do require that people go through stuff before they get enrolled.

Dr. Timothy Wilt

Yeah. [crosstalk]--

[crosstalk].

I guess I was trying to interpret the wording of "a period of conservative management." As a general internist, I—

Dr. Marc Duerden

Introduce yourself, please.

Dr. Timothy Wilt

Hi. Timothy Wilt.

Dr. Marc Duerden

Thank you, sir.

Dr. Timothy Wilt

Sorry, I thought I said that. Pardon me. Part of it was in my interpretation of the terms of "period of conservative management." As a general internist, it's pretty unusual, for me at least, to see somebody who that morning is in such excruciating pain that they emergently have to go for

something else. So at least in my way of [playing?] it, I was thinking of at least some other initial management before having any additional evaluation in terms of further pain management which would include pain medications, exercise, etc. for durations as Roger outlined, but I'm sure others might put some other parameters.

Dr. David Kennedy

And this is Dr. Kennedy. [crosstalk]—

Dr. Ben Shwachman

This is Dr. Shwachman. I think the period of conservative management, a lot of that, unfortunately, I think there's an element of money in that from some of the carriers. If it's you that's hurting, I think you want everything to get yourself relieved. My pain and your pain is different than his pain. And the next question is the risk of these injections, and I think all of us can say that the risk of these injections are really down. You can get in trouble also by just taking NSAIDs. So I think that if a person is in pain, if you wait long enough, sciatica, these people will get better. The history of it is wax and wane. And so if you wait long enough, they get better, but in the meanwhile, is that treating people? I don't know.

Dr. Marc Duerden

So, Dr. Kennedy, I'll give you a chance to jump in in just a second. But, Dr. Shwachman, is there any literature you can cite for that opinion?

Dr. Ben Shwachman

No, I can't cite any literature. I can only say these people hurt. I don't think anybody's really done a study of-- I haven't seen a study of how long this conservative period should wait. I haven't seen it. Maybe somebody can correct me that there's literature showing that you can wait two weeks. And then, again, how much pain is the person in before you do anything else? This is really a very amorphous situation, and unfortunately, frankly, I think a certain amount of it is geared on a monetary basis.

Dr. Howard Rosner

This is Dr. Rosner.

Dr. Marc Duerden

Go ahead.

Dr. Howard Rosner

I agree with that. I think that what the study we really need to see is discussing natural history of the disease. What's the difference between conservative care and doing nothing in terms of some patients get better and some don't? If we just have patients go about their normal lives, is that considered conservative care? There's really nothing that I'm aware of that demonstrates that providing conservative care or doing nothing is better for a period of time. It just doesn't make sense. And I agree that if a patient is in extremis and unable to get out of bed that that's a good indication for a procedure.

This is Roger. I'm just going to try to respond to a couple of the previous comments. And the first was, I was just referring to the evidence when I made my statement earlier that there aren't studies because the studies usually require people to have pain for a certain period of time before they will enroll them. That's because of whatever: clinical practice, maybe insurance, payment, whatever. Whatever reasons are there, that's just the way the trials have been done. I don't think we'll ever get a trial with people in extremis, people who are in so-- I mean, I've had patients like this before who are in so much pain. They can't sit. They can't do anything. They're writhing around in pain in the office. And those people are never going to be enrolled in a trial. These are people who will be managed because they're suffering a lot. And I don't think that the-- I don't think we'll ever have a study like that. There may be studies of people with more moderate pain that could compare two weeks or whatever, six weeks of conservative therapy. We just don't have a trial like that yet. So I just wanted to kind of clarify kind of, just from an evidence standpoint, what's available.

[crosstalk].

Dr. Ben Shwachman

This is Ben Shwachman again. The difficulties is your pain is not my pain, and my pain is not your pain. I came out of the Marine Corps, and the answer about pain is, "Are you a Marine?" "Yes, sir." "Then shut up," and that's the end of it. So person to person is varied. And just like I said before, I don't know any real studies, and I can't help but feel, and I've seen this over 30 years with work comp in California and with large HMO groupings—

Dr. Marc Duerden

Well, I'm going to take moderator—

Dr. Ben Shwachman

-- tend to stretch it out and I believe that it's a financial situation.

Dr. Marc Duerden

Dr. Shwachman, I'm going to take moderator privilege.

Dr. Ben Shwachman

Eventually, they do it.

Dr. Marc Duerden

I'd like to not deal with what we feel and what we think and try to keep it with the literature. So I'm not trying to cut you off, sir; I am trying to just keep things focused. And what I'd like to do—

Dr. Ben Shwachman

The problem is there is no literature, I think, one way or the other. We've heard that before.

Dr. Timothy Wilt

But there is literature about [inaudible] interventional treatments for low back pain that includes sciatica. I know the American College of Physicians looked at an evidence review authored by Dr. Chou, and we provided a lot of recommendations on the treatment options. So those would be some version of what would be considered conservative management for people with low radicular and non-radicular low back pain.

Dr. Joshua Hirsch

This is Dr. Hirsch. If we still have time, I'd like to make a quick series of comments. First, I agree with Dr. Roger Chou, or with Roger Chou. We would never be able to randomize people in extremis. Number two, in the augmentation world, we actually do have things looking at this and coined the expression, "Conservative therapy is not risk-free therapy." It's important to bear in mind. That's in keeping with Dr. Shwachman's point. My question, though, was, I'm not sure if, Dr. Kennedy, you told us what score you recommended.

Dr. David Kennedy

Yeah. So, great question, and I'll come back to that one. And I want to make one other comment, and I think this is bearing out. And Dr. Chou is right and I agree with what I said earlier, which is the reason for the comment is most of the literature to date that does show an efficacy does require a conservative treatment period. What is interesting, and I think this group should be aware of, is what defines that conservative period is all over the place. There are no set standards for this. There's nothing ubiquitous coming through. The one thing that does appear universal is the time rather than they have to undergo any specific number of treatments, and I think that that is the universal characteristic for most of these studies. Some studies do specify what they defined as a trial of conservative care, but that is the minority, and even those are fairly ill-defined in terms of medications, therapeutic interventions such as physical therapy, home exercise programs are some of them, some of them are just waiting periods. So when I read the question, "What level of evidence do I have that supports a period of conservative management," if I include watchful waiting and prime-based, which is not necessarily conservative management, prior to an epidural, based on the literature, it is somewhere around somewhat to very confident, because that's the majority of the literature. I do agree with the difficulty in randomizing people on those hyper-acute pain and the moderate to severe pain is very challenging, and I think that that group of people, if they are not responsive, I have a low threshold to waiting for them, so lower confidence. So overall, I'm smack dab in the middle because of the heterogeneity of this patient population.

Dr. Marc Duerden

And due to time-- and I recognize the issues that heterogeneity and the conservative management, but I'd like to move to the next question, which is six. We're discussing the types of conservative management. We'll turn the time over to Dr. Lankhorst.

Dr. Michael Lankhorst

All right. So, "What level of confidence do you have that the evidence support there should be documented pain relief failure of at least two classes of medications prior to patients receiving an epidural procedure, notations that could [inset?] copious non-opioid analgesics, anti-epileptics, anti-depressants, muscle relaxants, steroids, etc., or documented contraindication to these drug classes?" I think there's a lot of tie-ins on this question to the last question in terms of sort of that conservative care. Most of the literature that I went through and the guidelines from the various societies are that,

yes, patients should likely fail at least one class of medication, but most of them suggested more than one class of medication. I will go back to the acute versus maybe more longer-term or moderate levels of pain. I think if you get a patient with severe pain that's debilitating and they're in the hospital or they're missing work, etc., then I don't know-- I mean, I think you're right. From the prior comments, I'm not sure that the literature necessarily says what to do with that. I think if patients are in a moderate level of pain, this guideline makes sense to me, and I would have a reasonable confidence in attempting that. I think it's pretty low risk to ask for a trial of NSAIDs or Tylenol or muscle relaxant, etc. I think if we're looking at some of the longer-term medications, that becomes a little more problematic looking at the anti-depressants or anti-seizure classes just because their duration of effect is so long [before?] they start. And again, I go back to the acute phase being an issue, having patients go through multiple trials. And I think back to where we were talking about randomizing patients, having done clinical trials for specifically for lumbar radiculopathy, patients won't randomize. I never had a patient in severe, acute pain who wanted to randomize into one of our trials. I think that's all I had for comments on this.

Dr. Timothy Wilt

This is Tim. And I thought that was a nice presentation of it. It gets to what we're trying to really get at with these questions. I think a lot of the argument comes around these extremes that realistically will probably never get asked. Maybe because I'm a general internist, but I try to think of the generalities and what we're trying to make out of a big, lumpy question like five and six, and that we would do really well to be able to guide our colleagues and the majority of patients and note some exceptions where there's no data or just there needs to be some version of physician decision-making. And with regard to number six, I'm struck by the fact that it's focused only on medications when there are obviously many other therapies. And when I think about it as a internist, I think about what other treatment modalities I may be able to offer. And so I know we're not changing questions, I guess, but I would view it as at least two realities of therapy rather than just two classes of medications.

Dr. Jeffrey Petersohn

This is Dr. Petersohn. We have to really recognize that conservative management does not result in success. It's a failure which represents a misdiagnosis and a misuse of resources. When looked at individually, the literature on NSAIDs, opiates, non-opiates, anti-epileptics, and skeletal-muscle relaxants, as well as steroids, none of these really show more than about 30% of the patient population improving. This strongly suggests that this is a wrong-headed requirement and that requiring a patient to tolerate two of these trials with low probabilities of success is really an inappropriate utilization either of medication or of time. And since these are not risk-free medications, I would strongly suggest that we consider reigning this in because I do not think the literature provides strong confidence that these medications are going to be successful.

Dr. Roger Chou

This is Roger Chou. Just wanted to, I guess, follow up on some of these comments. And one issue that's a little bit different, that's the steroid thing. The evidence on systemic steroids for radiculopathy is not good. The biggest trial was done at Kaiser just a couple years ago and showed, again, minimum benefit for something that I would say actually probably has more adverse affects that doing an epidural. And certainly, in clinical practice, oftentimes, patients will be expected or required to get systemic steroids before they come in, and I would actually say that's not good practice or, at least, not evidence-based practice. So that's just one concern I had about that particular drug class there. And then I think this is similar to number five. We just don't have evidence. We don't know what people get for conservative treatment in the vast majority of the trials before they come in. Nobody's

done that study. There is a natural history that a certain proportion of people will have accrued. A prior speaker said, "Well, this is insurance." It's not really just insurance. This is like IRBs. They don't approve studies because they don't want people to get unnecessary procedures, so they're not going to approve a study that just says just dump everybody into surgery or into this pain procedure right away. They require people conducting these trials to kind of do their due diligence. Whether that's wrong or right, that's the way that research studies are done. I think there'd be hard to do a study where you immediately have people get treatment without having anything beforehand. I just think that would be hard to get past an IRB. Maybe other people have had different experience, but that's the reality of doing clinical research in this country and others. So I'll just say the evidence isn't there. This is not an evidence-based, I don't think. I mean, it's hard to have enough confidence, at least based on the available evidence.

Dr. Laxmaiah Manchikanti

This is Dr. Manchikanti. Can make a comment? Just a closing comment, please?

Dr. Marc Duerden

Yes, sir.

Dr. Laxmaiah Manchikanti

Okay. Well, I think every one of the studies I have reviewed that have tried conservative management [then?], only they included the patients into the epidural injection group. So this is a common practice. We are all using the conservative management before we jump into epidural injections. Meanwhile, we have to differentiate between acute radiculitis and chronic pain. So if somebody's acute disc herniation and mobility is fine and everything, that patient may not need that much conservative management. But overall, all chronic pain patients always do receive these, and they should receive these. Thank you.

Dr. Marc Duerden

Dr. Petersohn, you were [inaudible]. So I know you were kind of closing on some of those comments. If you could go ahead and move on to question number seven?

Dr. Jeffrey Petersohn

Be delighted to. Thank you. In regards to complications to epidural injections, I searched the literature quite extensively, and I can find nothing really relevant in the literature in the past 25 years. It appears that the questions that were being asked are all pretty well-answered, either in our classic textbooks on regional anesthesia and our textbooks on interventional pain medicine. There is generally excellent agreement. First of all, medically controlled coagulopathy, if the coagulation status is normal, there obviously is no contraindication based on that fact. There is good agreement in majority of [inaudible] discuss this certainly systemic infection is contraindicated in [inaudible] spinal [inaudible], which also can be similarly a concern. Any kind of infection at skin site or the needle track would also contraindicate performance. There's excellent agreement with regard to acute spinal cord compression and acute myelopathy cauda equina syndrome. However, it's fair to note in chronic [inaudible] myelopathy-- pardon me, chronic [spinal?] myelopathy that it's entirely possible for a patient to have systematic lumbar disc herniation or lumbar spinal stenosis, and it would not be contraindicated in the case of a chronic myelopathy. Certainly, with regard to consent, it's an elective

procedure. There's good agreement that we should not proceed in that circumstance. The issue of an acute transverse myelitis rapidly progressed to neural deficits central to demyelination, there's really no evidence that suggest that we should perform epidurals in that context.

The only real issue that I think is important here is that in patients with a major risk factor for cancer or a strong suspicion for cancer with no established etiology. I looked extensively for evidence of leptomeningeal metastatic spread associated with epidural injections and found absolutely nothing, and it's notable that epidural injections in the form of local anesthetic and local anesthetic and local anesthetic with opiates are routinely administered as part of a multi-modality anesthesia technique and also used for post-operative anesthesia for patients with oncologic surgeries. So I don't believe that there is a contraindication supported by the literature for patients with major risk factors for cancer or a strong suspicion for cancer. And the last item is the literature does strongly support the performance of neuraxial injections of a steroid in stable multiple sclerosis. Thank you. That's all I have to say.

Dr. Marc Duerden

Thank you, Dr. Petersohn. Thank you for it because that was a difficult question. We appreciate, again, your precision in how you approached it and addressed each of the points. I would like to open the floor up to anyone else who would like to add additional comments.

Dr. David Kennedy

So this is Dr. Kennedy. I agree with Dr. Petersohn. The one comment that I would like to shift a little bit was the last, the presence of a CNS process resulting in presentation symptoms such as a transverse myelitis. The comment was that there is no literature that epidurals are indicated for this, and I agree. There aren't any studies done, but that is not the question at hand. The question is, is that a contraindication to the injection? And someone can have a demyelinating or other neurologic deficits and have something that is an indication for an epidural. I think that that's one distinction I would potentially make, and hopefully, he agrees with that.

Dr. Jeffrey Petersohn

[inaudible]. Point well taken. My sense of things that we should generally avoid those, but there's clearly no published evidence harm, and it would be incorrect for us to aggregate that option for treatment.

Dr. David Kennedy

Agreed. And studies haven't really specifically excluded these as a commonality. Some studies do, but the majority of them are not specifically excluding these diagnoses.

Dr. Marc Duerden

And the last speaker was Dr. Kennedy. Thank you, sir. Anyone else? Dr. Peterson. Dr. Kennedy. Very succinct. So we all move onto question number eight, which brings us to Dr. Reece. Can you read the question and start, please?

Dr. David Reece

Okay. Thank you. Dr. Reece here. The question is for number eight is, "What is your level of confidence if the evidence supports the benefit of epidural steroid injection outweigh risk for cervical radicular pain?" Up front, the score I would place at would be a 4. Highly confident that the risks of cervical radicular pain, knowing that cervical radicular pain, low back pain, and all other types of axial muscular skeletal pain have significant cost burden in the country and across the world. We know that the risks of untreated cervical radicular pain, while some studies show that, over time, there can be resolution, there's enough evidence out there to state that a lot of these patients don't do well with conservative treatment, including the fact that adding on Tylenol risks and [inaudible] chronic NSAIDs, and obviously, most importantly, with the opioid epidemic. And then to counteract that, or to support that further, epidural steroid injection risks, again, from an interlaminar standpoint, excluding cervical transforaminal injections, have very low risk with morbidity and injury. So again, my level of confidence would be a 4.

Dr. Ben Shwachman

So this is Shwachman again. Going back to the-- which is the same situation here, using NSAIDs, for example, for conservative management of these cases, there was a study a number of years ago, and this is what prompted the use of or development of COX-2 inhibitors such as Celebrex. And the study showed that the death rate of ibuprofen from bleed-outs was higher than the death rate that year of leukemia. So I remember that very much; that paper was presented at the California Orthopedic Association.

Dr. Roger Chou

Oh, this is Roger Chou. I'm sorry, I forgot who presented this one, but can you clarify the evidence? I mean, my reading of the evidence is that there wasn't that much evidence on epidurals for cervical radiculopathy specifically.

Dr. Marc Duerden

Dr. Reece?

[silence]

Dr. Reece, are you on mute? I wanted to give you an opportunity to respond.

Dr. Laxmaiah Manchikanti

Dr. Duerden, a comment? This is Dr. Manchikanti.

Dr. Marc Duerden

Yes, sir.

Dr. Laxmaiah Manchikanti

Okay. I presented this evidence in my question about cervical brachialgia, essentially the same thing with-- there are three randomized control trials performed under laparoscopic guidance, and all three were positive; one was borderline, but two were positive. But [inaudible] control trial and the complication rate with interlaminar epidural injections is very low, whereas complication rate comes with cervical transforaminal epidural injections. So interlaminar epidural injections, its evidence rate is

appropriate based on the three randomized control trials. And also, in multiple systematic reviews performed, they all rated with Level 2 or Level 3 evidence that [conflates?] to confidence level of 4 or 5.

Dr. Timothy Wilt

Hi, this is Tim Wilt. Could you be more specific about what you mean by positive? What were the control groups? What was the magnitude of effect? What were the outcomes that were measured?

Dr. Laxmaiah Manchikanti

Well, the magnitude of effect is the problem here because these are active control trials, so both of them showed similar. The outcome was a significant pain relief with 50% or more, along with 50% or more improvement in the neck disability [inaudible]. So based on that, at one-year follow-up in one study with local anesthetics, it was 72%, whereas with local anesthetics and steroids, it was 68%. This is when you [inaudible]—

Dr. Timothy Wilt

Yeah. I think some of us might disagree that that's an active comparator and would view that as no different than a placebo or an anesthetic control. That's not active stuff. I guess I would disagree with that interpretation that it's a positive find based on your description of it.

Dr. Laxmaiah Manchikanti

I don't understand.

Dr. Roger Chou

This is Roger Chou again. And Steve Cohen's trial compared an epidural for cervical radiculopathy versus medication that didn't do a lidocaine injection, and also didn't find any effect or say that the results were similar between the epidural and medications, basically, so. Anyway, it just seemed to me like the evidence here seems quite limited, at least compared to epidural steroids for lumbar radiculopathy.

Dr. Laxmaiah Manchikanti

A clarification on Cohen's strategy: he performed epidural injections, and then for one group of patients, he did not give any gabapentin, and in one group of patients, he gave gabapentin. The patients who received gabapentin did better than the patients who did cervical interlaminar epidural injections. So it is not just medication therapy, but medication with epidural did better. So that was the difference. Here, we did with local anesthetics and local anesthetic and steroids, ironically, local anesthetic actually did better than local anesthetic and steroids. So we don't want to accept that just saying everything is placebo. How can a placebo be there in a patient where two-year follow-ups, these patients have average pain of 6 to 8 months, and there is still repeated injections and repeated procedures? Placebos are good in acute pain patients, and once they have tried conservative management and everything else. But you're still talking about the local anesthetic being placebos, and Shanthanna et al. showed clearly that it is not the case.

Dr. Roger Chou

That's not what Shanthanna showed. Shanthanna showed that steroids were no better than local anesthetics. And if local anesthetics worked, why are you giving steroids? I really don't understand this line of reasoning.

Dr. Laxmaiah Manchikanti

Well, I don't, either, [inaudible], so let's go ahead and [inaudible]. Thank you, sir.

Thank you both. And [crosstalk] both pointing out some—

Dr. David Reece

Sorry. Dr. Reece here. I got cut off.

Dr. Marc Duerden

Okay, Dr. Reece. Thank you for coming back.

Dr. David Reece

Yeah. I'm not sure what happened with the connection. I also missed the question there, but I'm sure there was a debated discussion going on.

Dr. Marc Duerden

There was. The question, I think, in global sense, was that if cervical epidurals are more of a placebo effect and, therefore, there's limited literature to show that there is true efficacy in the treatment of cervical radicular pain, if I stated that correctly.

Dr. Jeffrey Petersohn

This is Dr. Petersohn, and I would strongly disagree. If you look at the clinical series of Li and also of [Costanzi?], these both show 70, 80 percent avoidance of surgical intervention following cervical epidural injections. I think it's very difficult to argue with that kind of success in any other context.

Dr. Roger Chou

This is Roger. I mean, studies, again, where you're doing pre/post evaluations, you see huge placebo effects. I mean, these are well-known. I mean, they've done randomized trials of fake [inaudible] cardiac surgery, bypass surgery, and they show big effects from-- you basically crack someone's chest open, you don't do the surgery, you sew them back up, and you can show that there's large effects on pain. These are well-described and well-known in the pain literature. I mean, I guess I'm having trouble understanding the reasoning for just accepting that these before/after effects are somehow meaningful, that we can interpret those reliably. We know we can't. I mean, this has been shown many times.

Dr. Jeffrey Petersohn

Dr. Chou, with respect, I wish we all lived in a more perfect world, but from a economic analysis of utilization of scarce resources, [inaudible] have to submit the technique that allows the reduction of surgery by 70 to 80 percent [inaudible] scarce resources in a way that few other options might allow. I don't think that-- as much as I understand your concerns about the possibility of placebo effect, and I understand how challenging it is to do these kinds of clinical trials, it's also important to understand that especially when you're doing cervical transforaminal injections, what you'll find in clinical practice is that if you believe it's a C7 radiculopathy and it turns out it's a C6, or it's a situation where one of the rootlets aberrantly exits through an adjacent foramen (?), you will not get the satisfactory result that you wish. So the techniques that are used in selection of patients and in deciding whether you should use one level or two level, these dramatically affect outcomes in clinical practice. And also, I believe because most of these studies tend to prefer single-level injections, these tend to provide a less robust degree of improvement. Now, a little bit later in this conversation, we have a question about, "Does the literature support addressing additional levels within the same region?" And we'll address that at that point, but I believe that many of the studies where you're looking at have substantial methodological limitations that make strong - how should we say? - belief or support imperfect at best. So I appreciate your considerations and I think you make good points, but I don't believe we have a chance to move past what evidence we have.

Dr. Roger Chou

So my only point is that the evidence is quite limited for epidural steroids. We don't have a lot of randomized trials. The ones that do don't show much effect versus a placebo or sham or whatever you want to call it. There may be other reasons to do cervical epidural steroid injections, but to say that we have the same certainty for cervical radicular injections that we do for lumbar, that's just not consistent with the evidence. I mean, I don't see how you could make that statement. And if you're going to criticize the RCTs for being flawed, well, the non-RCTs are more flawed. So I think that we have to be consistent in how we view the methodological limitations of the data.

Dr. David Reece

Hey. Dr. Reece here again. I just wanted to-- I mean, so addressing this question, the way I'm reading this, evidence supports the benefit of epidural steroid injection outweigh the risk of cervical radicular pain. So we're looking at benefits versus the risk of this pain, and so I feel like a lot of our discussion is being revolved around just are these efficacious, when this a comparison between benefit and the risk of this pain.

Dr. Marc Duerden

Yeah. So I think [crosstalk] pointing out the—

Dr. David Reece

I'm not sure where the [crosstalk] inconsistency is. I mean, I think they're both related to evidence on benefits and harm. I'm not sure how you're distinguishing efficacy from benefits and harms.

Dr. Marc Duerden

Right. So the question is based essentially on value. Value, in the way it was written, was benefit divided by risk. And so you have to assess, obviously, the benefit in order to put that into the equation.

[crosstalk]--

[crosstalk] evidence for both of them.

Dr. Laxmaiah Manchikanti

This is Dr. Manchikanti again. Again, the issue again comes to the placebo versus local anesthetic versus a steroid, but we also need to take this other consideration of a no-treatment group. Even if the patient is responding to placebo, like I said, after [inaudible] [is accurate?] and everything else, then if you don't give the placebo, patient is not responding, so what is the point? We still have to do the placebo. So placebos are given in some countries as a treatment, and Dr. Chou, as a co-author, reported that in [inaudible] countries, epidural injections were preferable to surgical interventions because they were not available in those, along with [inaudible] augmentation procedures. So there is all controversies. Again, the [inaudible] question is, what is placebo? What is local anesthetic? This treatment, whether it is placebo, local anesthetic, is it working or not? If it is working, this all is important for a Medicare patient rather than a kind of big discussion about what was the difference between this group and that group, so on, so forth. So that is my one-cent word. Thank you.

Dr. Marc Duerden

And we're going to end on that note, and we're going to move to question number nine and Dr. Rosner.

Dr. Howard Rosner

Okay. So thoracic radicular pain and epidural steroid injections, both things have a challenge, and that is that thoracic radicular pain is far less common than either lumbar or cervical, and so there is a paucity of information that way, and there is a paucity of information on studies of epidural steroid injections for thoracic radicular pain. There is a review article which was included in our documentation, and also a prospective, randomized, double-blind study done by Dr. Manchikanti several years later. Both of these come to the conclusion that there is at least a 50 to 60 percent benefit of thoracic epidural injection in a period up to 24 months post-treatment in the prospective study, with a minimum of risk. And because there is very little published on this, my confidence level is rated at 3, but this is an area that really does need much more study.

Dr. Marc Duerden

Are there any other panelists that would like to opine? Hearing none, we'll move onto the next question. Now, from question 10 to the end is questions regarding the performance of the epidural injection itself. And we've touched on it somewhat in some of the prior comments, but we'll turn first over to Dr. Shwachman for number 10.

Dr. Ben Shwachman

Yeah. First of all, there was a study a number of years ago showing that if you don't use X-ray fluoroscopy in doing these injections, there's about 25% miss rate. Using contrast is basically the same thing. You're seeing the same thing if you're going to do the injection under X-ray because otherwise, you really still don't know where you are without the contrast. So that's mandatory; it's not experimental. With respect to using anesthetics and cortisone, we've heard a whole bunch about that today, whether using anesthetic alone, whether using cortisone, or the combination thereof. So therefore, this is certainly not experimental. In trying to look at the literature, I really didn't find much

else [on?] what's in there. Maybe that's why we discuss that so much with respect to anesthetics and cortisones because there really isn't much else in the literature. And so I really don't know of much else is in that respect. So the rest, I believe, would be experimental.

Dr. Marc Duerden

And the rest of the panel have an opinion? Hearing none, I would [inaudible] move to Dr. Tracy and question number 11.

Dr. Deborah Tracy

I'm sorry, there's some background noise. I can't hear you. Hello? Hello?

Dr. Marc Duerden

Dr. Stevens, I think Dr. Tracy's-- we hear you.

We can hear you now.

Dr. Deborah Tracy

Okay. And did you ask me to answer my question?

Dr. Marc Duerden

Yes, please. Question number 11.

Dr. Deborah Tracy

Oh. Okay. Question number 11. "What level of confidence do you have that the evidence supports the following routes of administration: A, transforaminal; B, interlaminar; C, caudal? I have to say that I'm little a concerned about my answer because I've heard here today that us interventionalists participate in studies and promotes studies because we want to make money or because we want a positive outcome from the study, which is biased and slightly unscrupulous. And I don't think anybody on this call is unscrupulous, and I don't think the majority of physicians in the world are unscrupulous. So that being said, the predominance of the literature focuses on all groups, and some of the studies really limit ages to 30 to 50 years old. The average age of patients in my practice is about 76 years old, and whereas 25 years ago, I saw a 90-year-old every two years, now I see several 90-year-olds in a month. I have six active 100-year-olds, and over the past five years, I've been requested to consult on greater than 200 100-year-olds. The Medicare population presents an entirely different pathoanatomy that most of the studies cited. They have a higher disease burden and multifactorial back pain involving their entire spine: lumbar, cervical, thoracic with architectural changes, cervical thoracic [inaudible] deformities, thoracic [inaudible] deformities, and acquired scoliosis. Additionally, it is common to see multiple-level disc herniations, multiple-level hypertrophic facets, multiple-level spinal stenosis, central and foraminal, all in the same patient. Their treatment includes chipping away at each problem and building success with frequent tune-ups.

So that being said, I'll move forward with my assessment of the evidence. Among major systematic reviews comparing multiple modalities, Guo et al., if I said that properly, in Pharmacotherapy, 2017, in a network meta-analysis comparing the efficacy and tolerability of treatments for sciatica, concluded that epidural steroid was recommended as a good intervention. Louis et al., in The clinical

effectiveness and cost-effectiveness of management strategies for sciatica, and A systematic review and economic model in health technology associates, 2011, in The Spine Journal 2015, supported the effectiveness of epidural steroid injections in the same line as disc surgery and non-opioid medication. Li, in a systematic review and meta-analysis, compared the clinical efficacy of transforaminal and caudal steroid injections in lumbar and lumbosacral disc herniations in Spine Journal, 2018. He believes that lumbar transforaminal with non-particular steroid decreases complications and is superior to the caudal route in the lumbar epidural area. They explain that the transforaminal applies treatment to the ventral area, which is the target area for the disc problems in the foramen and using the inferior area of the foramen provides a safer approach.

Li, in a Systematic Review and meta-analysis, compared the clinical efficacy between transforaminal and interlaminar, not caudal, epidural injections in the lumbosacral disc herniation population, Pain Physician, 2018. In 12 studies, the lumbar transforaminal showed significant short-term and favorable long-term efficacy, whereas the Interlaminar was less effective in their opinion, secondary to the posterior deposition to the target area. Kaye et al., in The efficacy of epidural injections in managing chronic spinal pain, a best-evidence synthesis in Pain Physician, 2015, included 52 randomized controlled trials that concluded mid to high-level evidence for all three routes of injection. Dr. Chou and Dr. Manchikanti have expressed-- I was going to address that, but they have bantered between each other about that enough, so I will not talk about it. Makkar, in a randomized double-blind study, compared transforaminal to lateral parasagittal versus ilioinguinal for radicular pain in Pain Physician, 2019. In 61 patients, the study concluded that parasagittal route equaled the transforaminal route in central spread, which was 85% of the time and 51% in the interlaminar. Which brings us to-- I hope one of the panelists will be addressing cervical transforaminal injections and the case reports about these, because I think that parasagittal would be an appropriate route of administration if one is concerned about the transforaminal route.

In the additional reading material that was provided to us, the ACIP guidelines for 2021, we're provided 200 pages with 1,300 citations and the-- there's background noise again. The ACIP guidelines focused on each pathoanatomy. Disc herniation for caudal gave a strong recommendation for long-term effectiveness. Disc herniation for lumbar interlaminar gave strong recommendation for long-term effectiveness, lumbar transforaminal gave strong recommendation for long-term effectiveness, cervical interlaminar gave strong recommendation for long-term effectiveness, thoracic interlaminar was moderate for long-term effectiveness. And then in central spinal stenosis, caudal gave moderate to strong recommendation; lumbar interlaminar was given a strong recommendation for spinal stenosis; lumbar transforaminal, a moderate for spinal stenosis; cervical interlaminar was moderate to strong for spinal stenosis. For axial discogenic pain, caudal received moderate to strong recommendation; lumbar Interlaminar, moderate to strong recommendation; cervical Interlaminar, moderate to strong recommendation. For post-surgery syndrome, caudal, moderate to strong recommendation; cervical interlaminar, moderate to strong recommendation. In summary, in this physician's opinion, based on a large array of evidence that transforaminal, interlaminar, caudal given in the lumbar, cervical, thoracic, and caudal routes for different pathoanatomy’s are safe and effective with a notation that caution should be used for the cervical transforaminal using best practices. So my answer to that would be 5 for interlaminar, 5 for caudal, and 5 for interlaminar and transforaminal, but.

Dr. Ben Shwachman

This is Dr. Shwachman. If I can comment on that, obviously, if you have a radiculopathy, the drug has got to get to the nerve. In 1973, in the British Journal of Anesthesia, they injected contrast transforaminal, interlaminar, and caudal, and what they found was that in 48% of the time of an interlaminar injection, while they had a good [inaudible] spread, the spread down to L4 and 5 was about 50% at the time. It's kind of interesting. I guess it's old because it states the charts [inaudible] and of the lumbosciatic syndrome to require reappraisal. I think the use of the interlaminar approach, which is so extremely common, comes from aesthesia because anesthesiologists were not using X-

ray, they couldn't read it, and they needed an end point. You have an end point with interlaminar [but also?] resistance or the hanging drop. Don't have an endpoint with a transforaminal or caudal, but if we're using fluoroscopy and contrast, we don't need the end point, And based on this article, frankly, what I do is I usually head for the transforaminal and/or caudal over the interlaminar.

Dr. Timothy Wilt

Hi, this is Tim Wilt, and I just like to comment first on the overall confidence of the evidence, and then on the other comment about some things that were alleged to be said. On the latter, I have not yet heard anybody on this committee meeting yet state that the reasons for [police?] or praxis are benched on financial or other needs. I think I've heard people equate the science and the evidence, and there may be strong differences and beliefs in that, but I've not heard anybody say anything that we think one person's viewpoints and practices are colored with their finances. No offense. Maybe, but I have not heard anybody say that, so. Just for the records, and because it's being recorded. I [crosstalk].

Dr. Ben Shwachman

This is Dr. Shwachman. I don't think, nor do I know of, any physician that is faking the approach that you've alluded to that is taking either the approach to doing the injections, the cause, doing the [inaudible] versus conservative management, and so on. I don't know any physician that's looking at it from a financial standpoint. The thing that does happen financially—

Dr. Marc Duerden

Yeah. Okay. I think that people agreed that we don't want to address that issue.

Dr. Ben Shwachman

--[inaudible] companies.

Dr. Marc Duerden

Yeah. The issue of economics will—

I'd give the—

The issue of economics will not be continued to be discussed. We'll continue just to go back to the literature itself and the clinical efficacy.

Dr. Timothy Wilt

Yes. I agree. But it was a statement that was brought up, and I think it's fair to at least note that I have not heard that on this conference. Two, I am looking at the literature about the overall effectiveness of interventions, primarily focused on lumbar, but we had that brief discussion about cervical that the overall effectiveness of epidural corticosteroids did not, to me, rise to an extremely confident level that it was effective or that it received more than a small effectiveness at short terms, and that in the [inaudible] trials and systematic reviews that were available, I did not see that effect vary by approach. So I guess that would be my response to it.

Dr. Roger Chou

Yeah. This is Roger Chou.

Dr. Deborah Tracy

Which article are you talking about? I was just saying [crosstalk].

Dr. Timothy Wilt

For example, the randomized trial in spinal stenosis and the systematic reviews, at least two of very recent ones, the Cochrane review, one by Chou, and I think there was some other ones that I also looked at that did not show a large-- that really showed that the effects really did not vary by approach.

Dr. Deborah Tracy

You weren't commenting on the literature that I had discussed?

Dr. Timothy Wilt

I have not. There are some of those. I'm not fully aware of those. I am commenting on the Cochrane review that looked at randomized control trials published just about a year ago and looked at that very question and did not see a large effect. I did not see, really, the effects varied by approach.

Dr. Laxmaiah Manchikanti

This is Dr. Manchikanti.

Dr. Timothy Wilt

And [crosstalk] of the effect that we discussed. I'll leave it at that and let others chime in.

Dr. Laxmaiah Manchikanti

This is Dr. Manchikanti again. Thank you. I don't have any conflicts of interest other than backing the guidelines. Again, we go into the basic issue. Tracy has presented expert evidence here. Again, we are looking at the difference between the two groups, and then there is not that much difference. However, these are all active control trials. Under [laparoscopic?] guidance, there's only one placebo-controlled trial performed in non-Medicare patients in non-US population. Otherwise, there are no such studies concerned. So by converting all active control trials into placebo-controlled trials, we are really doing a major disservice to the nation and a major disservice to the authors of this. In fact, I am one of the authors of the 16 [determinative?] control trials. So I never meant that I was not using local anesthetic as a placebo, but you come and change it to a placebo without my permission, without nothing doing with it, with none of the author's permissions, and how does that become important? So question is here, does local anesthetic help? Does steroid help? So we are showing that both are helpful, and steroid probably is somewhat better. And Tracy was showing that there is difference between transforaminal [crosstalk], so.

Dr. Marc Duerden

So Dr. Manchikanti, yeah. You're absolutely correct, and I'd like to help you focus that to do with the approach. This is the procedure approach, not necessarily the other issues that are before you right now.

Dr. Laxmaiah Manchikanti

That's correct. That's what I'm trying to say that they keep saying that there is no evidence, and they quote the three systematic reviews. All three of them took the same approach and converted active control trials into placebo control. So that is what we are talking about. The authors never meant them to be placebo control, but in the systematic review, they did that. So if you do the same thing in a randomized control trial, that will be considered as fraud. Nobody has done that for systematic reviews, but this is not what authors meant. That is how it was converted. But if you don't convert them, you keep them as active control trials, there is plenty of evidence, as Dr. Tracy said. Thank you.

Dr. Roger Chou

This is Roger. So I really don't want to keep going on and on about this, but I'm going to say one thing, and that is that Dr. Manchikanti, you may not say that those are placebo or sham treatments, but many of these authors do, and most of them do, so whatever you're calling them is not what other people evaluate. And again, as I've said before, if you don't think steroids do much, then why are you giving steroids? Why aren't you just doing lidocaine epidural injections? In terms of the current question here, I was just going to say, I think, as Tim says, there's no clear difference between the approaches when you try to analyze them statistically, which we have done, and so have others. But I will just make the comment that the trials of caudal epidurals is quite old, most of them, and it's a pretty-- I don't know what the right term is. I mean, it's not a very specific technique, right? You're giving the epidural way low, and then you're expecting it to kind of trickle up to the level that you want it to be at. I don't know how much caudals are being done these days, but I don't have the sense that they are as popular as they used to be, and I personally don't have quite as much confidence, at least in the caudal approach, but I'm not going to [crosstalk]. [I'm?] talking still.

Dr. Ben Shwachman

There is this study that I cited, and I would recommend that you perhaps look at it. It's in the British Journal of Anesthesia, so that's, I think, a legitimate journal. And all they did-- they weren't doing cortisone or anything. They just wanted to know what they can reach, what happens, what the volume situation is, the size of the patients, the position of the patients. All of that is in your study. And I've seen a number of situations where interlaminar have been done, and obviously, it apparently did not get to the nerve root, and it was quite unsuccessful. I did a caudal or might have then proceeded to do a transforaminal, or started with a transforaminal and been quite successful. Now, that's anecdotal, I admit, but it is based upon an article that's a legitimate article in the literature.

Dr. Roger Chou

Yeah. I'm not referring to contrast studies. I'm referring to studies that look at clinical outcomes. And the studies that looked at clinical outcomes, as they say, there's few of them that look at-- the trials of caudal are pretty old, and like I said, I just don't have as much confidence in those results.

Dr. David Kennedy

So this is Dr. Kennedy, and--

[crosstalk].

Dr. Ben Shwachman

[crosstalk] situation, then we're supposed to look at the—

Dr. Laxmaiah Manchikanti

This is Dr. Manchikanti again.

Dr. Marc Duerden

[crosstalk] Dr. Kennedy. Hang on, Dr. Manchikanti. We going to have Dr. Kennedy first, and then Dr. Manchikanti.

Dr. David Kennedy

So I'd like to echo what Dr. Chou said. I think that there are studies, and majority of new studies are looking at flow patterns. If we do look at outcomes, the problem with a lot of the caudal studies are what we described before in terms of the heterogeneity of the groups. I mean, many of those studies did not even have an MRI diagnosis to know what tissue target to differentiate stenosis versus disc herniation versus other causes of pathology. So my level of confidence in caudal is less than the comparators of interlaminar and transforaminal because both of those have a more robust body of literature on them.

Dr. Laxmaiah Manchikanti

Yes. There are the several studies with caudal epidural injections, more recent ones, and performed under [laparoscopic?] guidance. The question now is that we are performing them under [laparoscopic?] guidance. By no means, I just want to do the caudal epidurals, but there are certain indications for caudal. One of the indications is patients with post-laminectomy syndrome. We are not going to go through the scar. At the same time, to do the transforaminal bilaterally will be not so efficient, so caudal may be the choice in those cases. And if you cannot reach that area, you can perform with a catheter and put the catheter in there. Also, in patients who are on antithrombotics, interlaminar is considered as the highest procedure you can do with the caudal epidural or even transforaminal. The evidence's difference is not really that much between caudal and transforaminal. The interlaminar are actually better than transforaminal sometimes. Transforaminal are better than-- so either way, they are effective, but not as effective as that. And Dr. Chou question is, "Why don't you use local anesthetic?" Majority of the doctors, many of them, if they respond to the local anesthetic, that's all they use. If they don't respond, they go to the steroids. Steroids do have some indications. We have shown that in our studies, and many of them have shown that. But based around that, calling the local anesthetic a placebo is not appropriate. Thank you.

Dr. Marc Duerden

Well, thank you, sir. So the issue of steroid and local anesthetic discussion continues to revolve-- or evolve as the discussion has gone on. I would like to limit the discussion on that point and stay more

with the issues of the questions at hand. And with that, we're going to move on to question number 12 with Dr. Wilt, and particularly, the issue of scales.

Dr. Timothy Wilt

Hi, this is Tim. I'm going to lead the question. "What is your confidence that the clinical literature supports that the epidural steroid injection provide at least 50% pain relief, and what scales do you recommend for measuring pain relief?" We score that on a 1 to 5. I'm going to start with the latter first, and I would like to expand that to pain and function, that pain should not be the only measurement of treatment effectiveness, that it should include some versions of function because pain doesn't always equate with function, and vice versa. So many-- I'm not going to come up with an exact one. Several of them are validated. They should be validated to be ideal in the condition at hand, and they should be adjusted in terms of their minimally important difference and responsiveness to the severity of the pain and ideally to issues related to populations, language, etc. There's a lot of data that scale scores are often taken from one and used in another situation, and that the data where they're derived, right, not always translates to how they eventually get used.

I think results [are a?] difference in whether you are talking about research studies or clinical practice. There may be some very good scale scores ideal for a research setting that realistically are just not very applicable for clinical practice. It might be a little different in this situation than something that is just common and seen every day in a primary care practice, makes up half our practice, but. Some that have been included in trials include the SIPs, the ODSI and the RMD. I'm using acronyms there. I think everybody on the call is familiar with them. I think they should report both items as this has been talked about, looking at minimally noticeable and minimally important differences, change from baseline, change versus the comparator and percent that achieve what's considered a minimally important difference, and you standardize metrics to determine whether the effect size is considered small, moderate or large, and then probably base that on patients as well as an expert opinion. So there are a variety of ways that these scales need to be derived and utilized.

Okay. So that's kind of long-winded there. I'm going to go then to what do I believe my confidence is in at least 50% pain relief. I think we've debated this a lot. I think it depends on a lot of how you look at it. It's not only the time, the duration of [inaudible]. It's typically been viewed as immediate, short, intermediate and longer term, and then it may also be somewhat dependent on the severity of the disease. I'm going to focus it primarily on lumbar, low back pain. We've heard some information about other kind of conditions. Cervical, I think there's a general agreement that the greatest amount of data are in lumbar or low back pain with or without, quote-unquote, "sciatica" with that. I think based on results of, and mostly due to, the two conditions, herniated disc and spinal stenosis, I think based on results of methodologically sound randomized control trials in both of those conditions that I have a score of about 1; that it provides compared to a comparator of either saline, lidocaine, or some version of a sham; that it does not produce at least a 50% pain relief at any of the time periods, and that there's probably very high confidence that it does not achieve more than about a 10% improvement, which is typically considered small in pain or function versus those controls; and that when you look at, quote, "responders", i.e. those who get at least a 50% response from baseline, that about less than 5% in the epidural steroid injections achieve a 50% more than the control group achieve a 50%. So that's my response.

Dr. Marc Duerden

Very well said, Dr. Wilt. Thank you. We'll open the discussion to the panel, particularly regarding the issue of-- remember, this is in regards to a policy establishing 50% as the level of pain relief. What does the literature show to that?

Dr. Joshua Hirsch

This is Josh Hirsch. So I thought that was a very outstanding answer by Tim in terms of going through all of the studies. I think, though, the answer gets away from the question a little bit because you're not asking 50% - we will not get into the argument again of sham versus not sham, which you asked the group to stay away from - versus, I think, in that clinical patient. Is that correct? Could you tell us what's your vision with the question, I guess?

Dr. Timothy Wilt

My vision with the question is looking at evidence that what we talk about with our patients is compared when we evaluate the effectiveness of therapies. It's versus what is a control, not what is it in a pre/post design. If one were to say, "What is it pre/post? What percent of people in a single-arm study achieve at least 50%?" or, "What is it who achieve a 50% improvement for baseline in the epidural and what is it in, let's say, the anesthetic or the placebo group?" you'll find a given percent have that in that spinal stenosis study as well as at approximately 30% achieve that, but it was about 3% more in the epidural steroid than it was in the lidocaine group. So I think most evidence reviewers and most approving organizations would look at it versus the control group rather than a pre/post. Certainly, medications wouldn't be typically looked at as a pre/post. I think you could consider that if these interventions were your, quote-unquote, "N equals one study." Why don't you just do it and see what happens? And we do that clinically all the time. We say, "What the heck. There's no cost. There's no harm. Let's see what happens." And if it worked for you, what's the difference? It's kind of like the patient says, "My urinary symptoms are better when I take saw palmetto." Even though the data shows it's not better than placebo, you go, "Well, it's cheap, it's safe, you wanted to use it. Try it. Tell me what you think." I mean, it's not [inaudible] it's reversible. Yeah. [That is?] typically how I would evaluate evidence.

Dr. Marc Duerden

Dr. Wilt, I agree, but I would like to refocus. The question is why does-- or does the literature define responder, or how does the literature define responder, and is that 50%?

Dr. Timothy Wilt

Oh, no. Others on this call will probably be able to answer that better than me. But a responder comes in different ways, and if they do classify, it's usually a bunch of folks like us sitting around a conference call, "What's the magic number? Close your eyes. Yeah. 50. 50 sounds good to me." There's no real science behind it. They just kind of to be cheeky, they kind of guess and they make an educated guess. Why 50? Why not 30? These scale scores should typically be derived to figure out what is a minimally noticeable difference. That's what's considered the minimally, quote, "important" difference, though when you think about harms, I'd really like minimally noticeable rather than important. And then there are other mathematical ways of calling small, moderate, or large effects. And, mathematically and otherwise, typically a 10% or a standard mean difference of 0.2 is considered a small effect. Something around a standard mean difference of 0.6 or 0.8 is large. And 50% would be probably considered pretty large by all measures, especially if it was safe and if it avoided downstream consequences. But in the trial for spinal stenosis and some of the other epidurals for herniated disc, it doesn't convincingly reduce the need for surgery. So where you draw that line is really arbitrary.

Dr. Roger Chou

Yeah. This is Roger. Just to build upon what Tim said, I mean, there have been some proposed, let's say, meaningful pain relief, and Sir [Rick Deo's?] group and other people have put out consensus statements, and they're usually around 30%, at least. That's what the CDC guideline actually says for opioids. But there is some element of arbitrariness to the trials. Usually if they use a numerical number, it's either 30 or 50 and it just varies. Some actually do both. I think some of Dr. Manchikanti's studies actually do both or record both. And then many studies use some kind of categorical scale so they'll report something like almost complete relief or good relief or great relief and you can kind of translate them, and there are actually some studies that show that there's a fair correlation between somebody saying they have moderate or substantial relief and about 30% benefit. So anyway, it is a little messy but that's, unfortunately, the way that the literature looks.

Dr. Timothy Wilt

No, it's not unique to pain in [inaudible]. That's hardest with all these patient-reported outcome scales. It's a challenge for everything.

Dr. David Kennedy

Yeah. This is DJ Kennedy. I agree. I mean, I think that if the question is not, "Are steroids efficacious at 50%?" but, "What does the literature define?" it's all over the place in how the literature reports this in terms of outcomes, meaning whether they're using mean or categorical data or whether they're defining it as a NSAID, whether they're defining it as 50%, whether they're defining it as, again, as Dr. Chou mentioned, some substantial or something else. Some of them actually do it in avoidance of surgery and other utilization of other healthcare modalities. I mean, I think there's a lot of ways that this is defined in the literature, and it's pretty messy.

Dr. Timothy Wilt

Yeah. I mean, I think that they all offer some information that I talk about with my patients, and that's just in pain. But what you might say the average effect and the average patient is no greater than small, about 10% or less, then you can kind of say, compared to a control, that's generally considered a placebo or a non-active control, there is no statistical difference. Or you can say the percent achieving at least a - I'm just going to make it up now - 50% compared to the control is not different, and it's about 3 to5%. But you could also say, "Hey ,compared to where you are today, we could do an injection, and I don't know exactly why it might, but about X% of people notice at least a 50% benefit." Those are not fully unreasonable ways to say it to patients when you critically evaluate the science. The highest quality way is to look at the [depth difference?] versus the comparative.

Dr. Laxmaiah Manchikanti

This is Dr. Manchikanti.

Dr. Marc Duerden

[crosstalk]-- go ahead.

Dr. Laxmaiah Manchikanti

Dr. Duerden, can I speak? Thank you.

Dr. Marc Duerden

Yes, sir.

Dr. Laxmaiah Manchikanti

I have no conflicts of interest. This question is relates to how do we get the patient in a healthy preparation if we are doing the epidural injection, not the kind of [make?] control and all these things. So for this patient, if he has 50% pain relief for certain duration, as it will be defined further, can we repeat the injection? If the patient gets less than that much of relief, we are not going to repeat the injection. So in that context, 50% relief, there is significant evidence, and multiple studies have considered that significant difference and they proceeded only if they had 50% relief or better relief. The 50% relief actually comes from the legal terminology possible/probable thing. Above 50% is probable; below 50% is possible, so that is how it comes. But there is significant evidence by looking at the NRS, the numeric rating scale, as well as Oswestry Disability for the lumbar spine and Neck Disability Index. These are the things we clinically apply. Again, this is not a research forum, so for clinical application for preparation of the LCD, there is plenty of evidence to support that patients should have 50% pain relief for the duration. The present LCD for the first injections, it is six weeks, and after that, it should be at least two and a half to three months. So that is what it is, and probably, that is what it would be in the future, so it's very appropriate. Thank you.

Dr. Marc Duerden

Thank you, and we're going to actually get to that with Dr. Chou's question, but our next question is actually going to be question 13. So-- no, sorry. Dr. Barnhill, if you could read the question and answer it, please? Dr. Barnhill, are you there? Not wanting to waste any time, what I'll do is we'll move to Dr. Chou in question 14 because it was started to be addressed in the answers from above. So Dr. Chou, if you could, please?

Dr. Roger Chou

Yeah. Sure. I think this has actually been addressed before. I think Dr. Kennedy brought this up and I mentioned it when I presented for question two, and that is that the benefits are demonstrated primarily in the first few weeks after doing the steroid. I think there's some question about what the relevance of that is, how to interpret that, and what it means that there aren't long-term benefits. But yeah, the benefits are primarily in the first 4 to 6 weeks. This is against sham and placebo, and again, not just epidural local anesthetics but also epidural failing as well as [stuck?] tissue, either failing injections or local anesthetics, but it would be against a variety of sham or control treatments; you get the same results. So I don't have a lot of confidence that we see a lot of benefits after 6 weeks versus controlled. I think question is what the relevance or importance of that is.

Dr. Marc Duerden

Any other panel members like to opine?

Dr. Laxmaiah Manchikanti

Yes. This is Dr. Manchikanti. Again, this depends on is it your first injection or the second injection or second procedure. Once you decide on proceeding with it, if they respond to the past two procedures,

then the response becomes much longer. The past procedure may or may not have minimum of six weeks, but all of the studies show that they have had six weeks of response, the ones who responded. The ones who did not respond with that kind of response, they never did well if you continue the injection therapy. So actually, this is one way that underscores, one way this overscores, but in a therapeutic phase, you are expecting two and a half to three months of relief. That is 13 to 16 weeks of relief. So six weeks is appropriate; I think there is significant evidence for that. Even all the negative studies also show that six weeks is appropriate.

Dr. Marc Duerden

Thank you, sir. Is there anyone else that would like to opine before I move back to Dr. Barnhill on question 13? Dr. Barnhill? Dr. Barnhill, I think you're still on mute.

[silence]

Okay. Dr. Lankhorst, we're going to put you up next, and it's on question number 15, please.

Dr. Michael Lankhorst

All right. "Is there evidence supporting repeat epidural treatment if the initial epidural treatment did not result in substantial pain relief?" All right. So at least in the articles that I went through, I think there was evidence for cumulative benefit in some cases, and so I think-- I read this two ways. I read it initially as if there was no improvement on the initial one, then I would say, "No, I didn't see anything in the literature supporting repeat epidurals if there was no improvement," and that's where I get to the what would be defined as substantial improvement in this case. There certainly were several articles looking at repeating the injection when patients did gain benefit, and most of them did show cumulative benefit, at least in what I went through. So I think it depends on how we look at it. If we say, "Yes, there's benefit in repeating with cumulative benefit," then I would say, "I have confidence in that." If they had no benefit on the first go-around, then I would say, "No, I wouldn't think that there would be a reason to repeat." So I had difficultly on this question defining what really substantial benefit would count as looking at the literature.

Dr. Ben Shwachman

This is Shwachman. I did not do any of the literature search on it, but my question, since you did do the literature search, is what if the approach is different, that is, if an interlaminar is done and unsuccessful, what about transforaminal given the article that I gave that they may not have got drug to the nerve site? And this time, they go in and, for example, the fifth nerve starts at L4 and emerges at 5, and they do a transforaminal L4 and a transforaminal L5. Is there any literature saying, or any problem saying, that you saw with trying it with a second, different approach? But work comp people in California. We'll allow two epidurals, and I guess on the basis of you changed your approach. Can you just [say?] anything about that?

Dr. Michael Lankhorst

I guess what I would say is—

Dr. Marc Duerden

Go ahead, Dr. Lankhorst

Dr. Michael Lankhorst

--in terms of what I saw in the literature. I didn't see them necessarily. I guess maybe I struggled just to define this. But seeing them defined, I personally would change my approach if I thought the clinical indications were clearly there. But then saying, "Yeah, I definitely found a randomized control trial that said if you--" I didn't. I didn't find that literature. So I don't know that it's wrong, necessarily, to change levels and consider doing-- I think if you change your approach, then maybe that's a different story altogether, but I don't know that I necessarily found an article specifying that.

Dr. Roger Chou

Yeah. This is Roger. Just going to say that I am also not aware of any trial that has looked at doing a different approach for somebody who's failed one. There is one trial, the WEST Study. This was done by Arden, et al., I think in the UK, that found that if somebody did not respond to an initial injection, they did not respond to a second one, but I don't believe they changed the approach. They used the same approach.

Dr. Jeffrey Petersohn

This is Jeff Petersohn. If one reads the guidelines of the International Spine Intervention Society by Nick Bogduk, Dr. Bogduk makes a very pointed notation that the injection contrast demonstrates, essentially, the face validity of the injection. So if you do not document that the injectate reaches the presumed site of origination of pain, then you do not have a technically valid injection. So I would suggest that his comment indicates that if you can accomplish targeted delivery of drug that you were unable to accomplish earlier, this would certainly support that as a standard clinical practice.

Dr. Michael Lankhorst

I guess the way I look at it is as sort of an issue of how the question is framed. And I think that-- that's where I get into these-- kind of sort of a caveat here. I think there's certainly an argument to change your technique if anatomically, because of prior surgery or whatever happened with a block, you don't feel that there's an adequate block made. And I think that's a perfectly reasonable approach. And I think even again, I go back to the argument of substantial versus not substantial, I guess in practice and back to what Dr. Chou pointed out, I wouldn't necessarily say that if you had no relief on a first injection, I wouldn't repeat that injection. Now, if you want to make the argument to either change your approach, or if you said, "Hey, no. This patient did get some benefit. Maybe it's not as much benefit as we would like, but they got some benefit," then I think you can make the argument, yeah. Okay. That's enough that maybe a repeat injection, because of the articles that suggest cumulative benefit in those that do respond, then it is reasonable to repeat. So I think if you have some response, then repeating is reasonable. If you have no response, then I would say if you're going to change your approach for anatomical or other reasons, then that seems reasonable to me. But I think if you're simply saying-- I mean, I go back to some of the question of what's an evidence for a series of injections, and I would say multiple articles and even guidelines have come out and said no, there's no real evidence for just doing a series of injections regardless of the outcome. And so I think if you have minimal to no relief at an injection site, then I guess I would say I would not be confident in repeating at that level.

Dr. Jeffrey Petersohn

This is Dr. Petersohn.

Excuse me. [crosstalk]—

If you read the [crosstalk] paper from 2013, I think they only had a 5% of the population that benefitted from a repeat injection, but the point's well taken. It would be unethical to perform a randomized controlled trial of, and submit patients to, a failed technique because I don't think we can assert an assumption of equipoise in this. So it would be difficult to obtain the kind of level-one evidence we might otherwise prefer. Thank you.

Dr. Ben Shwachman

This is Dr. Shwachman.

Dr. Michael Lankhorst

Excellent. And so that—

Dr. Ben Shwachman

What I'm hearing is there seems to be a fair agreement that if what you're talking about is changing your approach or if you're looking at the cumulative effect, it would be appropriate, but just taking a series of three would be inappropriate. And I think that the literature would show that, that the accumulative approach or the change in your approach would be appropriate. Just doing three in the same way with no difference and so forth would just not be appropriate.

Dr. Marc Duerden

So, Dr. Petersohn, we're actually kind of leads--

[inaudible].

Yeah. This actually leads to your question number 16. If you could encapsulate it?

Dr. Jeffrey Petersohn

Absolutely. There's limited literature on this. Again, there's some concerns about the ethics of how you would do this. You withhold treatment for one problem. and there's a scant literature. There is a very nice article by [Bartensky?] that looks at 350 consecutive patients, of which 61% had single-level and 38% had double-level injections and 1% had triple nerve-level injections. Interestingly enough, they correlated the history. The examination came [inaudible] to select candidates, and what they did was they looked for reproduction of pain upon injection of each individual nerve to judge the contribution of that nerve for the patient's overall pain. And it was interesting that only 82 of 132 double-root patients clearly have symptom reproduction on injection of both nerve roots. Now, that's a fairly large proportion. And what they did note, interestingly enough, that 11 patients had prior ineffective or partially effective injection after a single-nerve injection, but after they added the second level, 10 of the 11 had complete or near-complete relief. So I think there clearly is good evidence for injection of a different nerve level in the same spinal region.

It would be also worth looking at the criteria for EviCore Healthcare in their CMM of 200 epidural steroid injections. This is published on February 14th of 2020. And to quote, "A diagnostic selective nerve root block and spinal level other than the initial level is considered medically necessary when all the following criteria are met: response [inaudible] a block of less than 80% relief, evidence of multi-level topology at least seven days since a prior block." So in any event, if one wants to go back a little historically, you can look at, for instance, Cousins and Bridenbaugh, 2009, 4th edition, which is most recent - unfortunately, I trained at a much earlier edition - and they make a specific note that

what they recommended is that in the situation, for instance, where you're looking at an L4 and L5 radiculopathies, that you bring the patient in, do an L5 nerve root injection, park them in the recovery room, reevaluate them a half an hour later, and if need be, do the second level. Now, obviously, that's administratively very impractical in this day and age, but I think there is certainly support for the performance of treatments at a different nerve level if the prior level that was performed was either incompletely efficacious or a new symptom develops. Thank you.

Dr. Marc Duerden

And so in the interest of time—

Dr. Keith Barnhill

[This is?] Dr. Barnhill.

Dr. Marc Duerden

Oh, hang on just a second. In the interest of time, I would like to yet go back to Dr. Barnhill on number 13. If you can read the question, sir, and go ahead and start.

Dr. Keith Barnhill

Sorry. I apologize. I got stuck on mute somehow. Anyway, it's corrected. Question 13: "What is your confidence [inaudible] improvement in function as a measurement, epidural steroid injection?" When I look at that question, a couple of things that I needed to ask myself is, what type of improvement are we looking for and for how long, and what tools do they use to identify this? So epidural steroid injections have a proven track record of successful objective pain relief and short-term improvement in physical function and improvement in quality-of-life indicators. Short-term was usually considered less than three months, and long, between three to six months and longer. The evidence will verify the statement is true for studies that use the various physical assessment and quality assurance indicators-- quality of life indicators, sorry. The results will also vary with type of pathology treated. Radicular pain and pain related to central and middle spinal stenosis tended to improve with either interlaminar, transforaminal, or [caudal?] steroid injection. [inaudible] pain relief symptoms of neurogenic claudication and quality of life did not improve when epidurals were used to relieve symptoms of axial pain in subjects surveyed greater than six months after their last injection.

So the small study [inaudible], in 2019, lumbar epidural injections were shown to improve objective physical capacity parameters in symptomatic lumbar central stenosis. In this study, they measured functional outcomes by using the short physical performance battery, the SPPB. Epidurals were found to be superior to medication management, a practice we are trying to avoid because it's potentially harmful for the elderly. The SPPB has a potential in monitoring epidural improvement or non-improvement in elderly patients with lumbar central stenosis. In a larger study by Liu in '15, they used several of the following functional outcome measurement tools. So here's his tools: BPI, the interference scale, the SSQ physical function subskills, eight-question version of the patient health questionnaire, Oswestry Disability Index, [inaudible] bothersome [mental?] index, low back pain bothersome index scale, weight change, opioid intake changes, low back outcome score, and others to determine that epidural injections were quite safe. The study also identified that although walking and symptoms of neurogenic claudication may not improve with the injection, the short-term pain level did decrease. In a study by [Donahue?] in 2020, they looked at functional improvements and secondary consideration to pain relief using particulate and non-particulate steroid [for the?] transforaminal steroid injections. They determined a simple yes-or-no questionnaire as follow-up to

[inaudible] whether the patient believed their overall mobility or ability to perform the activities of daily living had improved since their previous transforaminal epidural. At two, three, and six-month [inaudible] procedure, they were able to conclude that regardless of steroid type, subjects did experience improved function.

In a larger study in 2014, 2,634 subjects with radicular pain found, at two weeks and at two months following the transforaminal steroid injection, positive results correlating with improvement in pain levels and physical function. Similar results were obtained by Liu in '15 using the battery of quality-of-life indicators. In contrast, Chou, 2015 performed a systemic review and meta-analysis on radicular pain and pain-related stenosis. In their analysis, they found similar short-term improvement in function, but long-term relief was not the same, [eventually?] mentioned that [inaudible] steroid [inaudible] stenosis. [inaudible] in 2016 used the ODI, and they used the Roland-Morris Disability Questionnaire to determine that transforaminal epidurals were not effective at reducing physical disability and improving quality of life. However, in that study, the ODI is more sensitive towards [inaudible] more seriously disabled subjects, while the RMDQ is best for subjects with minor disabilities. So in summary, there's a significant amount of evidence to support the use of epidural therapy for short-term relief of radicular pain related to disc herniations with stenosis. There's also a few reports to support physical and functional improvement once pain relief is achieved. However, long-term benefits have not been established. That concludes my presentation.

Dr. Marc Duerden

Thank you, Dr. Barnhill. I would now like to move to the question regarding optimal interval between the repeat epidural steroid injection to Dr. Kennedy's question number 17. And then following Dr. Kennedy's presentation, we're going to move to question 21 in the interest of time. So, Dr. Kennedy?

Dr. David Kennedy

Oh. Thank you. The question is, "Is there literature to support an optimal interval between repeat epidural steroid injections provided the previous injections resulted in at least a 50% relief of function, improvement for at least six weeks?" I feel the answer to this is no, and the reason for that is the optimal. This is, however, a complex question, as we have been discussing in the previous questions leading up to this, and it really does depend on the the natural history of disease process and the goals of the treatment we are trying to obtain. For chronic conditions that are managed with intermittent injection, the literature does support the efficacy of repeat injections in those have demonstrated a previous positive response. This is typically defined as a 50% reduction in pain for four to six weeks. However, there are a number of other studies, generally on more sub-acute pain pathologies, in which the goal is to resolve a painful condition rather than manage it. And these studies do injections frequently at an interval of two weeks, where they are stacked in and happening fairly close in proximity to each other, and those studies do have some results showing long-term relief. For example, I've personally done studies on herniated nucleus pulposus comparing steroids. They demonstrated long-term relief with injections that were spaced approximately two weeks apart in those that were determined to need them. The example of this would be a 35-year-old with a herniated nucleus pulposus and a pain radiculopathy where we're not trying to space injections but rather resolve an acute painful condition. As we discussed before, this group does generally require some demonstrated response. As we discussed, the medication needs to reach the target tissue. There needs to be some level of demonstrated response to justify the exact same approach coming through. Without that demonstrated response, I think the injectionist is required to consider an alternative approach, an alternate corticosteroid or medication, knowing that those have different responses or something different to reach the target tissue.

Dr. Marc Duerden

Well done. So we'll move to question 21 with Dr. Reece. Go ahead, sir.

[silence]

So is Dr. Reece on, or is he on mute?

Dr. David Reece

Sorry. I'm here.

Dr. Marc Duerden

He may be on—

Dr. David Reece

Do you all hear me now?

Dr. Marc Duerden

Okay. Very good. Yep, you're there now.

Dr. David Reece

Great. So the question - again, Dr. Reece here - "Does the clinical literature provide evidence that epidural steroid injections can be administered safely at the same time as other interventional procedures such as set nerve blocks?" And yes or no is the question. And again, from a clinical literature standpoint, I would say my answer is no, and then also, I would say from clinically that I think the goal of most of our pain practitioners is to use these interventional procedures to diagnose specific pain generators. Adding multiple injections to this at the same time, I feel, detracts from that purpose, so my answer would be no.

Dr. Marc Duerden

Okay.

Dr. Ben Shwachman

Oh, this is Dr. Shwachman.

Dr. Marc Duerden

Dr. Wilt—

Dr. Ben Shwachman

I think if you're doing it from the standpoint of diagnosis, as he says, I would agree with them, but if you're doing it from the standpoint of treatment, I would disagree. Obviously, patients can have the

set joint problems as well as having radiculopathy. I always tell people the Lord is good to us. He allows us to have more than one disease at the same time.

[crosstalk]

Dr. David Reece

I also would agree from a therapeutic standpoint, but I think identifying sole pain generators is key and kind of a long-term management in my practice.

Dr. Ben Shwachman

No problem with that.

Dr. Marc Duerden

Okay. Dr. Wilt? Dr. Wilt?

Dr. Timothy Wilt

Yeah?

Dr. Marc Duerden

Question number 22, please.

Dr. Timothy Wilt

Thank you. So, "What is your level of confidence in the evidence to support repeat epidural injections for long-term, greater than six months, management of chronic back pain?" So as I read this, I look at it as long-term chronic back pain, and obviously, there are a lot of causes of chronic back pain, as itemized out in number four. I think almost all of us would agree that for a lot of causes of chronic back pain, we would not do an epidural injection, so I think it is important to note that. There are people come in with just chronic back pain, and that's an important comment to make that even amongst people who believe in epidural injections that there are a lot of things that we would not recommend steroid injection for, even from the start. Second, my overall score is a 1 based on randomized trials and systematic reviews really not showing much effect for people with chronic pain, even when it might be radicular, because it's hard, because it's primarily due-- it's, A, chronic, and B, primarily due to some version of a spinal stenosis, and the data on epidural injections for spinal stenosis is not very encouraging. It's unlikely to be due to an acute herniated disc by definition, and that it's unlikely that they can have an effect in the first place, and therefore, why would they have a benefit for greater than six months for repeated injections?

So I guess that's it. There's a confidence score greater than 3. I don't have a confidence score greater than 3. But I think clinically, we all have people who come in and say, "I want it. I really got a benefit from the last one. Otherwise, I'm going to surgery," or, "I don't have a good surgical risk or some other terminal condition, but are just absolutely bothered by back pain." Now, I'm getting away from evidence and getting an anecdote about what docs do. But I don't think there's any clear indication for who might be a good candidate because I think the first one was a 1.

Dr. Marc Duerden

Agreed. Okay. Understood your position. Dr. Shwachman, can you talk about the issue of moderate and general sedation-- or general anesthesia and moderate sedation? Please read the question.

Dr. Ben Shwachman

Yeah. First of all, from a literature standpoint, we're talking about safety and anesthesia, and you have to recognize, and the literature supports this, that from mild to moderate or deep sedation to general anesthesia really is one continuum. It is, I think, and the reason for us having anesthesia is to prevent, really, what we would look back on as a barbaric situation which we could not avoid because we did not have the knowledge of anesthesia. And people have a right to have things done in a comfortable manner to have anxiety relieved as well as that pain relief, and that's what the anesthesia provides. Now, you didn't want to talk about economics, but we are having a problem in California now. Yeah.

Dr. Marc Duerden

Oh. Dr. Shwachman, I'm going to cut you off there. We're not going to talk about economics. I would ask an additional question to you regarding this.

Dr. Ben Shwachman

[crosstalk] what is being done from a safety standpoint, and it is coloring it from what is done from a safety standpoint. It is not the doctor again. It is not the doctor again. It is the insurance or the government that has interfered in California, resulting in the fact that we are proceeding, in some instances—

Dr. Marc Duerden

Well, Dr. Shwachman, let me redirect you, because I would like to talk about-- Dr. Shwachman, please don't interrupt.

Dr. Ben Shwachman

I'm saying [crosstalk].

Dr. Marc Duerden

Dr. Shwachman, I would like you to address the issue of safety. It has been noted in the literature—

Dr. Ben Shwachman

The issue of safety is exactly what I'm telling you. As a result of the interference of government, in California—

Dr. Marc Duerden

No, no, no. Dr. Shwachman, I want you to-- I want you to hold up for a second.

Dr. Ben Shwachman

--we are now facing a situation in which safety is being in jeopardy.

Dr. Marc Duerden

Hold up for a second. Dr. Shwachman? I'm going to interrupt you. As a moderator, I'm going to request that you redirect your answer. If the issue of sedation is what you're discussing and to the issue of safety, hasn't the literature shown that to reduce the potential risk of an injection into the nerve rooted cell, or if they got paresthesia with the injection, one should pull out immediately, and therefore, then that would argue against-- one of the reasons to argue for or against the issue of sedation? I'd like for you to address that issue of safety.

Dr. Ben Shwachman

If you are taking general anesthesia, I agree with you. If you are taking moderate or mild sedation, the patient will respond and pull back. If you have mild to moderate sedation, the patient can respond. If you're talking general anesthesia, the risks definitely go up. Certainly, in the cervical area, I would oppose general anesthesia because of just what you said. If you're talking about mild or moderate sedation, I think patients have a right to it, and I think it can be done. And as you said, if you do touch the nerve, you will get a response and you can pull back.

Dr. Marc Duerden

And with that, we will end on that discussion and move to Dr. Tracy to discuss the evidence regarding maximal steroid dosing.

Dr. Deborah Tracy

Can you hear me? Can you hear me there?

Dr. Marc Duerden

Yes. Yes, ma'am.

Dr. Deborah Tracy

Okay. All right. So the answer based on the available literature of effectiveness, pharmacokinetic side effects for each session, no more than 80 milligrams of triamcinolone, 80 milligrams of methylprednisolone, 12 milligrams of betamethasone, and 16 milligrams of dexamethasone or equivalent steroids. My level of confidence is a 5. Hello?

Dr. Marc Duerden

Excellent. Yes, excellent. Thank you, Dr. Tracy. Dr. Rosner, question number 25, please.

Dr. Howard Rosner

Question 25: "What is the level of confidence that the evidence supports the continuation of anticoagulation for epidural injections?" This is a very controversial topic, and the literature is, let me say, divided at best. There is practice guidelines from the Spine Intervention Society. There's reviews and practice guidelines from Astra most recently, 2018, dividing procedures into high risk, intermediate risk, and low risk, with the caveat the patients with an existing high risk of bleeding, concurrent use of anticoagulation, cirrhosis, liver disease, advanced renal disease, elderly, that they go into the high-risk category regardless of whether the procedure is high, intermediate, or low risk. In the Astra guidelines, they regard epidural injections, translaminar or transforaminal injections, as intermediate risk, and what we're talking about here is the risk of hematoma creating neural damage. And on that basis, it's kind of-- then the guidelines talk about the size of the epidural space and different levels in the spine. So if you get a hematoma at some levels, it's far less worrisome than at others.

And at the end of all of these guidelines, they say, "But it's still up to the practitioner," and then you have to discuss whether you have to stop the anticoagulants with the prescriber because, of course, on the other side of it is the risk of a thromboembolic phenomenon. And so the literature is there, it's replete, and it is all over the place, and to some degree, not terribly helpful, in my opinion. And therefore, my belief in reviewing all of this is I'm not so confident that the literature supports it one way or the other, and we get back to having to treat each and every patient individually and weigh the risk-benefit ratio regardless of the patient and the performance of an epidural injection.

Dr. Marc Duerden

Thank you, sir. Dr. Manchikanti, I'd like to have you address the issue of the epidural adhesiolysis, question number 26.

Dr. Laxmaiah Manchikanti

Thank you, sir. Again, I do not have any conflicts of interest, and epidural adhesiolysis has been studied in multiple randomized control trials, and multiple systematic reviews have been performed along with meta-analysis. There have been five systematic reviews; only one showed negative results, and all others showed positive results in post-lumbar surgery syndrome, frontal spinal stenosis, and [retractor?] disc herniation. In post-lumbar surgery syndrome, the outcomes were studied in six randomized control trials, with four relevant high-quality and two moderate-quality studies. Randomized [inaudible] by Manchikanti et al., with the inclusion of 120 patients, showed significant improvement of 50% in 70% of the patients in adhesiolysis group and 5% in the control group. An earlier study by Manchikanti et al. also showed similar results with significant improvement with 72% in the adhesiolysis group with hypertonic sodium chloride solution, 60% in the adhesiolysis group with 0.9% sodium chloride solution, and 0% in control group. [inaudible] et al. also studied 76 patients in post-lumbar surgery syndrome with positive results reported at six-month follow-up. [inaudible] et al. showed positive results. [inaudible] et al. showed positive results. Again, going to [inaudible] et al., that was the first study that showed positive results. In central spinal stenosis, there were two randomized control trials that showed positive results with inclusion of 50 patients by Manchikanti et al. with significant improvement in 76% of the patients showing more than 50% relief at 12-month follow-up. [Karm?] et al. studied 44 patients showing successful improvement.

When we come to the disc herniation, there was only one randomized control trial for disc herniation with a placebo control trial. This is a two-placebo control trial for [inaudible] adhesiolysis, showing 90% of patients in the treatment group with greater than 50% improvement compared to 35% patients in the placebo group. Only 13% of the patients underwent surgical intervention. Adhesiolysis also has been shown to be safe without major complications. Based on the systematic reviews and guidelines, evidence is level one in post-lumbar surgery syndrome, level two in central spinal stenosis and disc

herniation. Consequently, my confidence level is 5 for [inaudible] adhesiolysis and post-surgery syndrome, and 4 for central spinal stenosis and [inaudible] disc herniation, for an average of 4.5. Thank you.

Dr. Marc Duerden

Thank you, sir. In the interest of time, there are actually two additional questions at the end, and I would like each of the panelists to address them in writing when you fill out your surveys. And that is the issues that are addressed when you are discussing the support of the clinical evidence that the epidural injection steroid actually reduces the need for surgical intervention and/or reduces the need for opiates. I believe each of those questions are significant and need to be addressed by this panel, so if you would do so in writing, I would appreciate that. Having said that, I will now turn the time back over to Dr. Stevens for final remarks.

Dr. Leslie Stevens

Thank you, Mark, and thank you to our panelists. A very excellent discussion. I'm sorry that it was cut short. There were several questions that were to be addressed by all, and that was questions number 18, 19, 20, 27, and 28. If you all could just-- when you're responding to your SurveyMonkey link that was previously provided, if you want to opine or add any comments, much appreciated. And if you could submit your votes as soon as possible, that would be great. For those jurisdictional CAC members interested in participating, please vote via the SurveyMonkey link previously provided to you or send in your comments to your respective jurisdictional MACs, and the deadline for that is February 19th. And for everybody, the audio and transcript for today's meeting will be posted to MAC websites within three to four weeks. And again, thank you so much for your participation, and I wish you a good afternoon.

Dr. Roger Chou

Sorry, this is Roger. I sent an email earlier, but the SurveyMonkey doesn't work for the questions with multiple items. They only let you have one button to push, and if you try to do more, they erase your prior one.

Dr. David Kennedy

Yeah. This is DJ Kennedy.

Dr. Leslie Stevens

Oh. Bummer.

Dr. David Kennedy

I'm having the same problem, specifically with question number four, that I am unable to multi-select for all the different disease conditions.

Dr. Leslie Stevens

Yup. Mandy, any thoughts? I want to thank Mandy for all of her technical expertise. Do you have anything that you could add on the SurveyMonkey, or do you think we have to look into that?

Amanda McGarvey

We received the emails. I'm looking into it right now. I don't know why it's doing that, but I'm researching.

Dr. Leslie Stevens

Okay. So we might have to get back to you guys on that. Thank you for bringing that up. We have until February 19th. We'll be working on that very quickly, but I don't think we're going to get resolution tonight, right, Mandy?

Amanda McGarvey

I'm looking into it. I will see if I can figure anything out as soon as possible.

Dr. Leslie Stevens

Okay. Great. Okay. Again, thank you all so much, and have a great afternoon, depending on where you are, or a great evening.

Thank you.

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