American Heart Association

Endovascular Therapy: Science, Measures, & PMT Updates

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Captions by CaptionAccess

>> MARY PAULSON: Good morning everyone, and welcome to the Get With the Guidelines National Webinar. Today we'll review endovascular therapy, science, measures and PMT updates. Before we get started, I like to go over a few items so you know how to participate in today's event. We have taken a screenshot of an example of the Attendee interface. You should see something that looks like this on your own computer desktop in the upper-right-hand corner.

Our presenters today are Dr. Lee Schwamm and Dr. Jeff Saver. Dr. Saver is Professor and Senior Associate Vice-Chair of Neurology at UCLA and Director of the UCLA Comprehensive Stroke Center. Dr. Saver is widely published around stroke care including systems of care performance metrics. Dr. Saver was recently honored and given with the Gold Heart award, the American Heart Association's highest volunteer honor.

Our second speaker is Dr. Lee Schwamm, professor of neurology at Harvard Medical School and Vice Chairman of neurology at Massachusetts General Hospital, where he is the Director of Acute Stroke Services.

You may send your questions at any time during the presentation and we will collect these at the Q&A session at the end of the presentation, and one final note, there will be a short survey at the end of the call. I will now turn it over to Dr. Saver.

>> DR. JEFF SAVER: It is exciting to be able to discuss the Get With Guidelines, the new metrics being rolled out for this important advance in the care for endovascular therapy. Let's go to the next slide. Here are the disclosures for myself and for Dr. Schwamm. The objectives on the next slide are here. We will briefly discuss the rationale behind endovascular therapy and the metrics that have been developed for it. To recognize when a patient will be included or excluded from an endovascular therapy measure, distinguish between the commonalities and differences between Get With the Guidelines measures and Joint Commission measures for throwback to be. And what changes have been made in the PMT to capture these metrics.

The changes have been made because endovascular therapy is now an established part of standard care for patients with acute ischemic stroke based on the five positive trials there were published in 2015, and the focused update to the American Heart/ American Stroke Association national guidelines that followed later that year. These are now the established indications for using thrombectomy. It is currently not an indication to bypass t-PA but to do both/and. The highest-level evidences for patients who have the seven criteria shown here. This is a grade one level -- if they have a proximal anterior circulation occlusion, no large established infarct ASPECTS < 6. And you can fit within six hours of onset.

There's a Class IIA recommendation for those ineligible for t-PA but otherwise meet these criteria.

Next slide. Back again, I am sorry. In addition to these established indications that were developed in 2015, I am sure many people on the call today are familiar with the recent breakthrough announcements that have come out of the DAWN and Diffuse III trial. The patients can still benefit from thrombectomy.

Let's go on to the next slide. The DAWN trial looked at patients in these 6 - 24 hour window, and they had have a clinical court mismatch, a small perfusion CT or MRI and have a large stroke scale deficit indicating that there was a much bigger penumbral zone.

Next slide. Here are the findings from DAWN that in this group of patients between 6-24 hours, there is a dramatic improvement in outcome with the utility weighted Rankin score being improved at three months and patients functionally independent, the Rankin score increasing from 13% in the control medical therapy group, 49% in the thrombectomy arm, for every 100 patients treated, 49 will have a less disabled outcome, and 36 will be functionally independent. The benefit was maintained throughout the 24-hour window, you can see the graphic here. You can see there's a little bit less of an advantage in the later time window.

>> DR. LEE SCHWAMM: Could you explain the disability weighted, utility weighted Rankin scale?

>> DR. JEFF SAVER: Sure. The weighted ranking is a new way of analyzing the familiar Rankin scale, the Rankin scale is a seven-level measure of degree of disability when it goes from zero being completely normal, 26 being dead at three months and in between having some symptoms, and having the inability to go back to work. Each level is given a weight based on how valuable it is to providers, so we could find out the impact on stroke related health of all ranges of outcomes.

Next slide. So given the advances in thrombectomy care, we, of course want to be able to capture the performance of this intervention and practice in Get With the Guidelines stroke and help centers be able to iteratively improve the performance in comparison with centers across the country and help develop a set of measures around that. I should mention the DAWN and Diffuse trials have not been published in full-length form and not gone through peer review. They will not be eligible to change national guidelines until they are published in full-length form. And only then would guidelines change and only after the guidelines changing, getting with the guideline measures specific to DAWN and Diffuse III begin to develop for Get With the Guidelines. So this rollout, the tools we are reviewing today, are focused on the initial indications for endovascular thrombectomy within the six hours especially.

We will review 13 measures that are now in the EVT measure set. Three of these have correlations with Joint Commission measures and two are in the EVT specific Get With the Guidelines measures set. One is the Joint Commission Get With the Guidelines measure set, those three are the median door to puncture time or door to skin time, both measure sets. The TICI grade, using all five levels of the TICI score is in the Joint Commission set, and the 90 Rankin score is in both sets. the Get With the Guidelines outputs allow you to automatically review your performance on those Joint Commission measures.

In addition, there are 10 measures that are going to be specific to Get With the Guidelines stroke that will give you more a detailed and a more granular approach to understanding different aspects of your system of care and outcomes, and hopefully empower identifying points of focus for quality improvement and drive system change. We will walk through each and the slides to come. Let's go to the next one.

For all of these measures, the general inclusion and exclusion is, which patients will qualify are shown here. To be eligible, you should be an adult over 18 years old, and have acute ischemic stroke and have received endovascular thrombectomy. Exclusion, if the stroke occurred after hospital arrival. This is for patients missing some key dates and times, determining the endpoints for time measures that are not available or having mis-entered time calculations. Our usual exclusion of patients having more than 120 days or enrolled in a clinical trial. Patients emitted for carotid intervention, electively. And there are exceptions, such as patient initial refusal of intervention and the use of comitant investigational research protocols.

Let's go to the next slide.

With regard to patient eligibility for from thrombectomy, this is the first measure which is patients who are eligible for thrombectomy, how many patients received thrombectomy. These are the eight acceptable reasons for not having given thrombectomy to patient and they come straight out of the first five, come straight out of the grade 1A guidelines. 1A indication under six hours, and not beyond six hours.

Additional reasons are if the vessel was not reachable because the vascular anatomy occluded access or the patient or family refused where the patient had the thrombectomy at an outside hospital.

Next slide. Here is the report that you'll be seeing. This is for each of these we will briefly show the type of report that you will be able to automatically generate from a single button press in the output field of the Get With the Guidelines website, where you look to see how many of the patients eligible for endovascular thrombectomy actually receive thrombectomy. And you can look at this by quarter or different time period and compare your hospital versus all hospitals or your hospital versus comparable types of hospitals across the country.

Next slide. For the next measure, it is the door to puncture time, and this is the Joint Commission measure, which is looking at the median DTP that has to be reported and the Get With the Guidelines output will give you the median value but also the full distribution. You can see how the times are falling on either side of the median, and compare your performance to that of other hospitals. Again, different time periods. And you can compare how your hospital is changing over time hopefully reducing DTP times.

Next slide. New measure is DTP within 90 minutes, what proportion of patients who had thrombectomy had a DTP achieved within 90 minutes. The percentages are going to be shown again for your hospital versus all hospitals and in different time periods. There is not complete agreement as to the DTP time window, it is like we have DTA and door to needle is 60 minutes but in target stroke we also said it would be even better as door to needle 45 minutes. We anticipate door to puncture will get better as the sites across the country improve. A reasonable starting point based on the times that were achieved in the pivotal trials is door to puncture target of 90 minutes.

The next measures will be time intervals for other key moments in a thrombectomy procedure. It can be helpful to see other time points as well as you improve your system of care. The next time point is the time to the start of the revascularization procedure. If you use aspiration device, the time the aspiration is first applied. For this there will be a door to first pass will be reported both for medians and distribution, So you can follow how you are doing versus other hospitals.

Next slide. There's also a binary report of the same target, door to start of reperfusion with a target of 120 minutes for time from arrival to time of the first pass. again, comparing your hospital to other hospitals. Next slide.

>> DR. LEE SCHWAMM: At some point in here, Sonja, tell me when it is time to flip over.

>> DR. JEFF SAVER: At this point, I will hand over the next slide to Lee.

>> DR. LEE SCHWAMM: What I wanted to say before I complete this section is I want to acknowledge the tremendous role that Dr. Saver has played, not just in advancing the field in this area, but really one of the pioneers in the design of this new wave of trials, and really promoting the develop end of this new stent retriever technology that completely is transforming the face of stroke care. Delighted to have Jeff as a co-presenter but also want to acknowledge the pivotal role Jeff has played, not only in helping to bring this new type of treatment to patients by designing trials that will clearly now have convinced the skeptics that this is a treatment that's beneficial but working closely with Get With the Guidelines clinical workgroup to help us sort through: of all possible things to measure, what are the important things that we have in our armamentarium to do this?

You can think about this process really as an end-to-end solution measuring the speed to which blood flow is restored. The time from the catheter deployed to when the clot was actually engaged -- all the brain cares about is how long was I without blood flow? The measures we are giving you are actually designed to help you manage improvement when the total number is less than desirable. Think about these as five or 10 different ways to slice and dice the same core data set, but to help you understand: is my problem getting people to the hospital the first place? Is it getting them from the arrival to the hospital into procedure suite? Is the problem getting the catheter in place, navigating from the puncture site to the clot? Or is my problem getting the clot out?

Not only timeliness, but we will talk about efficacy. I will say, Sonja, I don't believe I have control of the slides, so I'll ask you to go ahead and advance them for me. This is door to reperfusion within 120 minutes. This is the percentage of patients who achieve endovascular therapy with a TICI grade of 2b/3 less than or equal to 120 minutes.

When we look at median times, that is useful. But the benchmark is to treat with endovascular therapy and to do it within 120 minutes. Achieving reperfusion within two hours. The reason we structure the measure this way is to look at the patients who achieved reperfusion. If you only got partially open or not open, it is really helpful to think about the timeliness of that care as opposed to the patients that did get open, how many were open effectively within the first 120 minutes?

Next slide. The next metric -- I see the controls now -- I don't know if I can activate them -- The next group that has really thought about this is the imaging -- is such a pivotal part of endovascular treatment, particularly documenting the presence of a vascular occlusion, that a picture to puncture time has been identified as another way of thinking about this. If you just disregard all the delays that happen until you do the imaging, from the time you know there's an occlusion to the time you puncture the artery to start the procedure, those are times easy to extract from the record -- some other times are more complex and it is one of the reasons the Joint Commission change their approach. PTP is the metric. And that is less than or equal to 60 minutes.

I have to say this will be a little more complex in the rapidly emerging scenario where more and more of the outlying hospitals that do not perform the procedure are starting to do vascular imaging to decide who to transfer. And so in those cases, a PTP time of more than 60 minutes may be expected, but the arrival to puncture time may be shorter because the imaging has been already done. This will be a relevant outcome for your patients.

Median and distribution of the puncture to reperfusion time. So this is trying to show you how did I do over the group of patients who have got a good outcome, meaning a TICI 2b/3 -- TICI is the grading scale for the amount of reperfusion and it has three levels, but level II has 2a and 2b. 3 is perfect. For the people who had a degree of reperfusion that seems to be associated with good outcomes, how many got it in 0-10, 11-20, etc. -- or greater than 120 minutes, as a comparison, a companion measure to the one that is a distinct cut off of 120; where am I in that process? This is the measure that will help you understand that.

This is timeliness of care in the population of patients in whom you did a good reperfusion. Next question is how did I do? The people I opened, I opened quickly and I did great but how many patients who I treated got there?

So this is really a measure of operator effectiveness, given the variation across patients. So this is the percentage of patients with acute ischemic stroke who received endovascular therapy, an attempt was made to re-catalyze, who achieved this high level of reperfusion? Jeff, I don't know if your line is open but my recollection is we are looking at somewhere around 80% was the average rate of reperfusion.

>> DR. JEFF SAVER: Yes. 75, 80%.

>> DR. LEE SCHWAMM: If you get 100% in everybody, maybe you are not making enough patients. Maybe your focus is so narrow you are not treating all the patients that could be treated. And if your rate is low, that is an opportunity to sit down with your interventionalist, and maybe it is the stroke service director, but that is an opportunity to say, why are we having rates that are so much lower compared to what other hospitals like us our achieving? That may be an opportunity to have a conversation or for education. There's a strong interaction between time and success of thrombectomy. The later you are in the process, the longer it takes to extract it, the less likely you are to achieve a high degree of re-canalization. So, there may be other aspects to the process that could be enhanced.

Next slide. This breaks out the 2b vs 3, what proportion had 2b vs 3. In the future, we may try to consolidate this into a report with three bar graphs. But this shows you that 70% of the time that they were successful in re-canalizing, it was mostly 2b, and 20% it was 3.

Are your interventionalists, this report -- can you go back one? Now we have, full cycle. We talked about all the different time points in time intervals. But now we care very much about the outcomes. We want to understand how well our patients are doing. Bear in mind, all the clinical trials have looked at 90-day outcome, not discharge outcome. Clearly, if you have a spectacular recovery and you get discharged to home after a large vessel occlusion, you did great, it is always possible something else could happen to you in the next 90 days that would alter the outcome, but many patients have a moderate or severe disability at discharge and recover back to functional independence.

This is a proxy for outcome, recognizing that because we are limited in Get With the Guidelines to the discharge disposition, we want to provide as much information as we can without burdening you to collect 90-day outcomes on everybody. Bearing in mind that for comprehensive stroke center certification one of the requirements is to collect a modified Rankin scale at 90 days on patients who undergo thrombectomy, so hopefully you are trying to collect it, but this will give you measure even for those patients who are unable to contact.

You can see the choices are familiar discharge destination choices of home, hospice, another acute care facility, another healthcare facility, expired, left against medical advice. The most common destination will be another healthcare facility, like a rehabilitation or nursing facility. I think the likelihood that there will be patients who get thrombectomy and transferred to another acute care facility will be small but there may be some very high volume, high capacity community hospitals that can do thrombectomy, but some patients may be transferred to the University Hospital. So it is conceivable that it could happen.

The mRS, here is a sample, "my hospital" in red, and all hospitals in blue...50% of the patients in "my hospital" ended up with a score of no significant disability despite symptoms, Rankin of one, and 50% Rankin two. That would be a great outcome. So, this will be very helpful, and again, your results will not be this good, 100% of your patients having a Rankin 2, but rolling is up on a quarterly or annual basis, it can tell you who is doing well and who is not doing well. And the ones that are not doing well at 90 days, is there anything you could have known on arrival that maybe would have changed your approach?

I want to shift gears away from measures and talk about, how will this change what is in the tool? How am I going to do this actual work? This is where I think we will probably get some questions and I'm hoping you will get some clarity.

One of the fields that will be available now, and for some of you, you have had access to these because you have been in special initiatives or have been a Joint Commission comprehensive stroke center tool user, because you are a comprehensive stroke center or you upgraded to the comprehensive center data collection platform because you wanted to collect this data, it may be brand-new.

Under brain imaging, you will now be asked not only was vascular imaging performed but was a target lesion identified? That is a large vessel occlusion and wasn't visualized using advanced imaging? You may have gone directly to angiography and it would be based therefore on the angiogram.

What do we mean by this? You are using this measure, the reason it is important, it establishes whether or not the patient is eligible for endovascular thrombectomy, EVT.

If you say, yes, to was a target lesion identified, indicate the side of occlusion. That means if there is a proximal occlusion, where is it? It is going to be most of the time in one of three places, the carotid artery, the middle cerebral artery, or the basilar artery. Most often, it will be the middle cerebral artery. The internal carotid, the portion in the neck is the cervical ICA, the portion that is in the brain is the intracranial ICA, and you would tick off the appropriate level, always tick off the most proximal portion. So if the report said there is an occlusion of the intracranial and cervical internal carotid artery, you could tick off both of those boxes.

And then we also for each of these carotid segments have been unable to determine or undocumented. So if there is some wording and you do not know what it is, but you know it is the carotid artery, and it is not otherwise specified, you can tick that box. And then we have, other.

Remember, the guidelines support internal carotid and MCA but we know that many providers are treating basilar artery occlusions with thrombectomy so we want to make your job easier to identify and document what the doctors have put in there , in their area, in the documentation area.

Advanced stroke care tab.

For the benefit of you, the abstracters, we have pulled all the elements that relate to endovascular treatment into a single tab. It is now aggregated to make it easier for you.

The first question is, was a mechanical endovascular reperfusion procedure attempted during this episode of care? By attempted, we mean they went to the suite, somebody punctured the artery and tried to do the procedure, it might've been aborted because the patient suddenly improved after the puncture. Or the aorta was so calcified they could not get through it or they could not access the clot, or they could not get past the carotid occlusion. So they started it but were not successful in completing it. We know they at least attempted it. That would be, yes. If they did not, are there reasons that are documented for not performing it? The physician wrote proximal occlusion present, but

ASPECT score too low. Or other reasons. Or the stroke may be too mild. If the NIHSS stroke scale was < 6 it may not be relevant to be documented.

Reasons for not performing therapy. We have a list of what we think are most of the potential reasons. We do have an "other" for reasons you want to capture. They do not exclude them from the measure population. So we tried to look carefully at the inclusion criteria. Remember, if you treat someone outside the guidelines like a DAWN wake up stroke type patient, you don't get these questions. It is only if you do not treat. We know this will require some tweaking over time. But the inferences you can make for the following three reasons -- if there's no proximal occlusion, you can just document that, you do not have to find a note that says I will not do a thrombectomy because I don't see a proximal occlusion because that will be 95% of the stroke submitted. Same with the NIHSS < 6, or they document the brain imaging is not [indiscernible].

Next slide. This shows if treatment was provided, right now it says MER but eventually will see EVT. Check all that apply. Was a retrievable stent? That is the most common. The Merci device is still commercially available but most are using an FDA retrievable stent. You can ask the doctor what they used.

A clot suction device, there are several techniques that now use catheters specifically designed. Jeff, are there other specific catheter systems you are aware of based on suction?

>> DR. JEFF SAVER: There are now three or four manufacturers making large catheters designed for suction approaches. We may need to send information about the available means as a supplement.

>> DR. LEE SCHWAMM: The penumbra system includes both the catheter I believe as well as a high capacity pump that actually sucks back on the clot. Some operatives use syringes and do not use a device. But we will provide more specificity around that as that becomes available.

Intracranial angioplasty, sometimes used with a non-retrievable stent. So the balloon gets inflated and the stent may or may not be placed at the same time. And more commonly, in patients who have a carotid occlusion or stenosis which is felt to be related to the intracranial occlusion, cervical carotid angioplasty with or without stenting may be done to allow access to the clot in the distal carotid or middle cerebral arteries.

Again, what you see described in the procedure note will drive you to document these.

Next slide. What would be reasons for delay? Just like we have did you treat with t-PA, if not, why not? And then we have if you treated, did you treat within 60 minutes, if not why not? If you didn't treat within 120 minutes, why not? Again, there are reasons for delay, and those include very similar to the t-PA measure, social or religious reasons, initial refusal, care team unable to determine eligibility, major medical comorbidities, they need to be intubated or had a cardiac arrest or they were hypotensive. And then a delay in diagnosis in-hospital time delays, equipment delays, those are things that add, keep you in the denominator but let you track that so you can do QI.

Two other reasons will be added for need for additional imaging and endovascular suite not available. Endovascular suite not available does not exclude you from the denominator but it helps you to understand why there might've been a delay because that might impact your staffing.

Next slide. I will go through all of the slides first and then we will return to questions because I think it is too challenging to manage the questions in the slides at the same time.

Here we are in terms of trying to maximize the rates of this high grade of angiographic re-canalization, so you can see the TICI grade at the end of the procedure is asked for. We care about 2b/3 for success but we want to capture the actual grade we achieved. Is there a documented grade post treatment? If it was not done, you can document it as not documented. This is breaking it down into 2b/3 option 1, less than 2b is option 2 -- will these auto populate to the previous question, Sonja?

>> SONJA: It will not because it is a Joint Commission data question, so we still have to ask it.

>> DR. LEE SCHWAMM: The slides went back, can you go forward again? This is an issue of harmonization with the Joint Commission. We are working on that. But for now, you have to answer that twice. When you select that the TICI grade was not 2b, so 0, 1 or 2a, or not documented, then this grade 2b/3 not achieve is not checked.

Somehow I have lost control of the slides again, Sonja, can you advance the slide?

Complications. This appears only for sites that have the Joint Commission layer. If you're using Get With the Guidelines comprehensive stroke center layer which you are not actually -- if you do thrombectomy many of these are turned on but you are not actually using the Joint Commission field, you will not see these. Was there positive finding on pre-managing of a hematoma, parenchymal hematoma... this will perhaps be challenging for sites working with the radiology department and/or the stroke team to get them to use the terminology of hemorrhage grading, which is PH1, PH2 or a remote intracranial hemorrhage. In order to -- you cannot figure this out yourself from looking at the radiology report unless it is specifically designated.

The other important thing has to do with what is the last NIHSS stroke scale documented prior to the IV t-PA at the last hospital? There's the baseline NIHSS stroke scale score and that may change before the start of either t-PA or intraarterial therapy/EVT. If the person comes in with the scale of 8 and nothing changes, the answer is 8. But if they came in with an 8 and improved to 2, and then got treatment and then worsened to a 7, they worsened after treatment and so that is something that is important to capture.

This is a micro screen shot from the previous selection under the admissions tab. You are asked for the initial NIHSS stroke scale score. If you fill that out on this box on the current form you tick baseline it will auto populate into this box. If you populate subsequent NIHSS stroke scale score, you will have to populate that yourself.

Next feature. In summary, patients should never receive endovascular therapy with -- should receive, excuse me, endovascular therapy with a stent receiver if they meet all the eligibility criteria. There will be a big push to make sure patients who are getting screened to see if they are eligible and if they are eligible getting treatment and if they get treated, to get treated as quickly as possible. Reduce time from symptom onset to reperfusion with endovascular therapies is strongly associated with better clinical outcomes. EVT measures capture the various time intervals prior to initiation of treatment. Updates reflected in the PMT aim to harmonize TJC and GWTG data elements.

There has been a little bit of drift and shift and things have gotten a little further apart. So I think that might be the end of the slides. Am I correct? Great. We are now at the brain full of question marks. Maybe the thing to do now is to jump over and take a look at some of the questions. Does that sound like a good idea? Maybe I will ask Jeff to come on back online with me and we can run through these questions for Jeff, I pulled the question tab out from the side of that panel on the right so it is a little bigger. First question, what is the date required reporting start date for these measures? So when are these measures going to go live, or are they already live, Sonja?

>> SONJA: They are already live.

>> DR. LEE SCHWAMM: Okay, so there's no reporting requirement, the measures are available to you. If you are collecting the data, that enables you to generate these reports.

>> DR. JEFF SAVER: The Joint Commission sites, for the three measures that are Joint Commission, there's a Joint Commission reporting requirement. All the other additional measures, there is no additional requirement.

>> DR. LEE SCHWAMM: Right. Would you consider adding a measure for the percent of each score for the 90-day Rankin? It be nice to see the percentage who have -- I think our measure shows that, does it not? It shows the percentage with each modified Rankin score?

>> SONJA: Only for 2b or 3.

>> DR. LEE SCHWAMM: Not for all patients treated.

>> SONJA: Correct.

>> DR. LEE SCHWAMM: That's a great question. Let's consider that for reports that need creating.

>> SONJA: It is included in the metrics.

>> DR. LEE SCHWAMM: Maybe they mean is there, there's no report that shows how often you calculated a TICI score. I think we have that captured in the sense that we are asking sites to record that. I guess if we see that there are high rates not documented we could do some targeted effort around that. That is one of the things I think we will be very likely to see high rates of compliance with.

Did the DAWN trial accept patients without a last known well time? If so, why are there patients excluded? The DAWN trial required you to be within 24 hours of last known well. So I think the reason they are excluded here is they do not, there not excluded for data collection they are just not in the measure report. You can still collect the data but they won't show in the report as patients in whom treatment was guideline recommended. But neither will patients who were treated 8 or 12 hours after last known well, because so we don't get ahead of the guidelines, the guideline only recommends at the moment treatment in patients who are last seen well within six hours per Jeff, any thoughts?

>> DR. JEFF SAVER: I agree with that. The DAWN has not been published it nor has Diffuse III. The guideline process doesn't permit new guidelines to be issued. That will have to wait for a further update of Get With the Guidelines in the future.

>> DR. LEE SCHWAMM: Great. PSA who transfer, are there any time metrics for transfer? Great question. They are coming. They are not rolled out yet but we do have a door in door out time for hospitals that we have been working on that we hope to release soon that is being driven by the mission lifeline stroke hospital group. And that will result in some enhancements to the PMT that will allow you if you are a hospital that transfers patients, now for the first time you'll be able to actually indicate in the record where you transferred them to, and whether you transfer them for routine care or for time critical care. So we think that will be a helpful update.

We only have a few minutes left. I guess an important question would be what about in-hospital strokes? So, for IVT in-hospital strokes have been an exclusion from the measure unless people are running it in the in-hospital stroke set of measures. We have measures... Sonja, do you remember?

>> DR. JEFF SAVER: We do. These are for, only for strokes that occur prior to hospital.

>> DR. LEE SCHWAMM: It is a different population of patients. It would not stop you from entering the patient into the database, but it would stop you from having that patient, the patient would not appear in the report.

Let's see. What will be used for the picture to puncture time? Is it the CT time or is it the CTA time? In this instance, it would be the time from the study that documents the presence of a vascular occlusion, to the time that the artery was punctured.

And then, let's flip through here. Unless Sonja or Mary, you saw a question that you think would be good to end on?

Here's a good question. Could inpatient rehab versus SNIF be differentiated in the discharge disposition report? Sonja, can you look at the specifications of that and see if we actually do make a distinction between those two destinations?

>> SONJA: What is the question?

>> DR. LEE SCHWAMM: For the discharge disposition report for endovascular, just like we do for regular discharge from the hospital, SNIF versus inpatient rehabilitation facility be displayed distinctly? Are they already?

>> SONJA: Not at this time, no.

>> DR. LEE SCHWAMM: Okay. I think the answer to that question that was raised by Jess is, yes. It may not be available now but we will put that in the...I agree there is an important distinction there.

Great. I think there's lots of questions, more questions than we have time to answer. But the team will review all the questions and try to get an answer published to those questions back out to folks in a timely manner.

>> DR. JEFF SAVER: I would add this is a first attempt at these measures. It is great to see the questions, we will all be learning a lot together. Everyone, please have patience as we cope with an entire new measure set. Your feedback will be absolutely critical to iteratively improve them, so we look forward to that. Lee, thank you for all of your leadership in the entire program.

>> DR. LEE SCHWAMM: Great. Well, thank you everybody. I hope this was productive and useful. We appreciate the questions because they help make us better. Have a great day, everyone.

>> MARY PAULSON: Thank you, everyone. Please take a moment to do the survey.