

International Perspectives on Stroke Triage, Diagnosis and Treatment
A Webinar Series Presented by the American Stroke

>> The webinar will begin shortly. Please remain on the line.

>> The broadcast is now starting. All attendees are in listen only mode.

>> Welcome everyone. Thank you for joining us for our four part webinar series international perspectives on stroke triage, diagnosis and treatment. This is the second episode in the series, diagnosis imaging and resource utilization. I am the associate portfolio advisor for the American stroke association. I will start today's program by going over a few important items.

In this webinar is jointly presented by the American stroke association and the Society for vascular and interventional neurology. While there are no CDs available for any of the webinars in this series a certificate of attendance will be available for each live webinar you participate in and fix will be accessible through the follow-up email you will receive. This webinar is being recorded and will be available prior to the next episode in the series.

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The moderates and presenters for this episode have shared the following disclosures.

You will

Jennifer Potter-Vig -- earned her doctorate and health services healthcare administration from Walden University. She has over 20 years of healthcare experience working with clinical teams and administration to develop strategic plans, quality management and public health initiatives in education. Note Jennifer will be moderating the audience submitted questions so you may not hear from her but you may receive a message from her through your attendee control panel. I will not pass it over to introduce our panel today.

>> Thank you and I want to say thank you for the ASA and for the SVIN for sponsoring this really great webinar series and I'm excited about the speakers we have and the impact this will have on the stroke care worldwide and it is a privilege to moderate this and also a privilege to have Jennifer here to help with the questions and the chats. So our panel today this is going to pass very quickly our panelists today are Dr. David Liebeskind of UCLA, Dr. Vagal of University Cincinnati, Dr. Marc Ribo in Barcelona and Dr. Leung in Hong Kong.

A professor of neurology UCLA direct 2]TJ0 Tc 0 Tw 4.70enn Tw 5.171 0 Td()Tj-0.0

The very brief objectives is to understand what we do in terms of evidence-based guidelines for imaging, to distinguish which imaging is proper based on our clinical assessment, compare considerations in access to stroke diagnosis in various countries and regions of the world because as you know obviously what you have available in one moment or another or region they vary and describe briefly touch upon the role of the mobile stroke units where regions and accessibility are now in flux as well.

The basis of acute stroke imaging is multimodal imaging with either the CT or MRI and when we speak about multimodal imaging this is a distinction to what people have called the plane on contrast, or a standard MRI standard brain sequence MRI where we have vessel imaging Weatherby CTA, the CT approach or MRA as well as perfusion. Multimodal imaging that terminology has or

We think about imaging from an ideal standpoint what is the ideal tool we would like give me a perfect definition of ischemic core. I would like to look at the volume of penumbra and do basic math on this and as ideal as this seems is very far from real. This is not what we deal with in a real-world basis it's not just simple math of looking at core and penumbra and coming to a mathematical solution.

That calculation is very very different in different levels of occlusion. A distal occlusion may not have the same degree of perfusion in the penumbral zone or the core. These may be time-based as well so there is a lot of complexity that gets thrown in and when even when you break it down to the most basic variables on time T_w 2.949 0 T_d $()$ T_j $-0w$ $>ot5$

variables. You cannot just get paged beeped with a command to go thrombectomy so selection still important. There are a lot of disparities all most

occlusion. The perfusion patterns are not the same most of the automated approaches have not been validated or properly tested so you are singing and what you are told is

ischemia? Is there a vessel occlusion, what about the collateral? Is there salvageable brain and wea

controversial category, under six hours do you do perfusion or not? And the guidelines basically say that it is recommended you do a CTA or MRA in preference to perfusion but not of the level of evidence is lower. Why?

What is less than six hours is there a benefit? This paper shows us that there is a higher benefit with use of advanced imaging in fact the trials that used perfusion or collateral imaging -- their odds ratio was higher than the trials without advanced imaging.

What about if the patient selection with perfusion collateral imaging does modify the expected therapy what is the disadvantage? One one thing to be care about -- it can actually also exclude patients of had the potential to respond

The Hermes collaboration showed no difficult modification by collateral grade. What did the guidelines tell us?

It may be reasonable to incorporate into decision-making again not a very high level of evidence but again that information is there for us on the CTA so we can definitely use it. What about MRI? I know David said they've been using it I can tell -- I still think CTC workhorse but definitely in these new recommendations thanks to the wake-up trial MR has made it into this guideline wherefore diffusion positive flair negative lesions can be used for administration.

The 2019 update says one more important thing whenever we think of imaging, advanced imaging should never delay for thrombolysis or puncture times if there's one thing that can take away is that whatever imaging we do we cannot delay the treatment yes we are now treating up to 24 hours and yes we have pushed the time boundaries but time is always critical.

Really pushing the time boundaries is artificial intelligence. We have automated aspects automated LVO detection automated perfusion, collaterals basically come on our phone or emails so they are definitely pushing the boundaries but I would suggest the man versus machine, machine can help augment our workflow our times but all this has to rely on our intelligence so we have to be careful when we look at these tools to make sure we are indeed making the right decisions. These tools are there to help us but we have to be careful and this can be literally an hour-long lecture of what are the pitfalls of losing AI tools in stroke imaging.

And finally is the art and science what David already said we know that when we think of imaging we are interested in the pipes the penumbra perfusion the parenchyma but the fifth P is the patient so the judgment is always based on evidence experience and patient factors and this is the million-dollar question. Which imaging paradigm is better for code stroke? Truthfully if this was not a webinar we would all be with our boxing gloves and people are very

passionate about their opinion but here's the answer. It all depends. There is way too much variance. I think it depends on the local institutional preference, the timing of the stroke but the big

about 6000. How many t-PA treated patients and how many we know if we are far from ideal next to optimal as you can see.

Still we are only reporting about half of the strokes as stroke codes are only half of them are activated as stroke emergencies.

Moreover, our registry helps us know on time and by region what is going on and you could see how year after year where increasing our number of activations and how we are increasing our number considerably and there is a geographical spread at we should work on this differences. Our registry allows town by town alert each code was activated and therefore we can we can work or identify particular stakeholders in each of these regions.

May be heard during the last year since 2017 we were running a trial that directly addresses one very important work should we initially transfer our stroke activations with [indiscernible]. First thing I need to remind and recommend that everybody uses a hospital scale as regimens by most -- that EMS can score the likelihood of large vessel occlusion. We use the RACE scale, if the score is greater than four -- to go to the closest center or to bypass the center to prioritize vascular treatment. The result is we stopped recruitment three months ago and the results of the trial will be presented in a couple of weeks at the European stroke organization conference and we will have a definite answer about which is the preferred option to

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increased or performed much better during the trial and they're able to reduce by 23% their door indoor out time so that influence the question whether to transport initially our patients if primary stroke centers perform better that is an incentive for them to get these stroke codes initially.

Another effect only happen if we change or decide on transfer algorithms is we can observe here. From 2016 to 2018 while we were bypassing half of the codes because they were randomized we observed there was a decrease in the number of thrombolysis -- if we decide to bypass one or 2% of the stroke codes there would be a dramatic reduction in the number of thrombolysis in the centers and on the other hand we can expect the other way around the comprehensive stroke centers we observed only by transferring by bypassing half of the codes to the comprehensive and increasing the number of thrombectomy if we change protocols to 100% there would be a dramatic increase in thrombolysis in the large centers but that may have a negative impact on the smaller centers that would lose e sm3 Td(4 478) (t h) 2.5 (e) 0.0 0.0 7.0 0.0 2.5 () Tc 0.002 0.007 0.02 0.04

center is an extension of your ER at the large center and you are able to dramatically reduce, have a competitive work at all times.

There is always as we say what is ideal in terms of imaging but is feasible but is optimally adapted? There are large discussions about should be performed CTA or advanced imaging or perfusion imaging on all patients or not? This is a debate that will try to show you what we are doing in our sitting here I'm able to advance yes. So again there is a lot of discussions about which is the ideal protocol and a lot of publications discussing these issues. In our reality what we observe in recent studies is that the rate of Aspects decline over time may be significant what we call perfect Aspects of 10 so there is a decrease from time of onset increases but the rate of patients admitted with a very low Aspect that make contra- indicate thrombectomy is really low so why should we screen so much for imaging it advanced imaging in the first six hours? We do not do that in our network. We do not use advanced imaging to select patients in the surly time window.

What about transfer? How often should we repeat imaging when we get the patient? We also performed a study in which we try to predict the comprehensive stroke centers which patients are going to have a dramatic decline in Aspects and we observe that basically we should only repeat the imaging if initially the patient at the primary stroke center had an Aspect score lower than 8 with a combination of a very high NIH. In this case the aspect score on arrival is important otherwise it is really probably not necessary to perform a second imaging.

The use of I t-PA we are going to be hearing more about non-using t-PA when we are able to initiate immediately a thrombectomy. There already two clinical Asian studies showing that is probably not inferior to withhold I t-PA you can start emulate thrombectomy. Soon we will have the results of the direct trial. Something happened with my slides here.

So what is happening in our reality? About imaging and my slides were moving along but in terms of availability of imaging here in our network we observed recently and regarding the use of ID t-PA when we gave it at the primary stroke centers finally 10% of it

high likelihood or low likelihood of LVO and create initial fast alerts.

So these were the concepts I wanted to share with you. Sorry I had

some trouble

areas are the crucial factors. Lower middle income countries bear over 80% of the global stroke burden despite about 20% of the total economic resources. Strokes occur 15 years of age earlier often at the peak of productive lives and because of poor health literacy improvement in socioeconomic status in some countries is paradoxically associated with increases in stroke risk and mortality example less exercise when you have a car or obesity from excessive eating.

The second factor underlying the disparity is geographic location. We know in some privileged urban hospitals like in this participating centers in this thrombectomy study

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So even when ambulance service is

Healthcare policy is not entirely based on scientific evidence. Overcoming hospital cultures and bureaucratic inertia is halfway to success. It is crucial to have connections and finding the right people to lobby. We always start something simple for example a call from the ambulance to the stroke center to save time but by the time of arrival at the hospital stroke team will already have reviewed the medical history and prepare for scan.

To solve manpower deficiency can take advantage of the broadband to develop networks and tele- stroke systems in remote rural communities so as to increase catchment population for thrombolysis. More solutions may come when more people have a mobile phone than have a toilet.

I heard of a patient to receive a thrombectomy twice in the same year because of the failure to detect afibrillation after the first stroke.

Another app can track the critical times along the patient's journey within the hospital. Through telemedicine we are now having broadcast and life procedure demonstrations to talk to thousands of miles away. Asian hospitals governments are now more willing to invest in stroke care facilities.

SVIN has prepared a white paper on mechanical thrombectomy and is ready to release on world stroi9 0 Td 0 Td5 Tc 0.005 Tw [(a)-1.5 (re)]TJ0 T-30.28

have another major trial from Europe. However as of today is completely, perfectly reasonable to withhold the IDT PA in some situations in specific situations I'm talking always when you can initiate a thrombectomy right away though situations are those in which you can expect that you expect to be implant a stent either on a tandem occlusion or in cases in which you suspect ICAD I think very reasonably we can withhold IDT PA indicates that will allow us to initiate antiplatelet treatment if we could place a stent.

>> That addresses one aspect of the question but another one was I think the concern was about safety doing an arterial puncture and thrombectomy in the setting of t-PA.

>> There is lots of data showing that it is completely safe even in terms of on the puncture side or even -- patients underwent a thrombectomy and t-PA do not have an increased risk of stroke (or) Tj0 Tc 0 Tw 1.20

>> So a mobile unit that has a mobile scanner mobile endovascular suite and then you could use remote thrombectomy from another hospital.

>> Absolutely.

>> Dr. Vagal?

>> I would say just the way we are changing our imaging workflows and paradigms so quickly I would highly suggest having at least one radiology champion in your team. Because it makes a lot of difference how to -- whatever's going on in the trial world and the guidelines we are getting into the real world you need the radiologist, the technologist on board so that would be my biggest advice. Get radiology involved.

>> Thank you. Dr. Ribo we one take-home point that you want everybody here to remember?

>> In terms of imaging I think it's not because you can do it that you should do it. Remember that sometimes not always more is more sometimes less is more and therefore if you don't need this information or you are not going to be changing it if 0 Tw 20257407640 Tr

