

THE PREHOSPITAL **VAN** STROKE ASSESSMENT

Prehospital evaluation
for large vessel occlusions

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DISCLOSURES

FINANCIAL DISCLOSURE:

No financial relationships to disclose

UNLABELED/UNAPPROVED USES DISCLOSURE:

None to disclose

Chad Curry is a Licensed Paramedic with the state of Texas, a certified Texas EMS Instructor, and a certified Flight Paramedic (FP-C). He is the Training Chief for University Medical Center's Emergency Medical Service (UMC EMS) in Lubbock, Texas and has been employed with UMC EMS for over 23 years. His experience includes over a decade of employment with AeroCare as a flight paramedic, and he continues to work with them today.

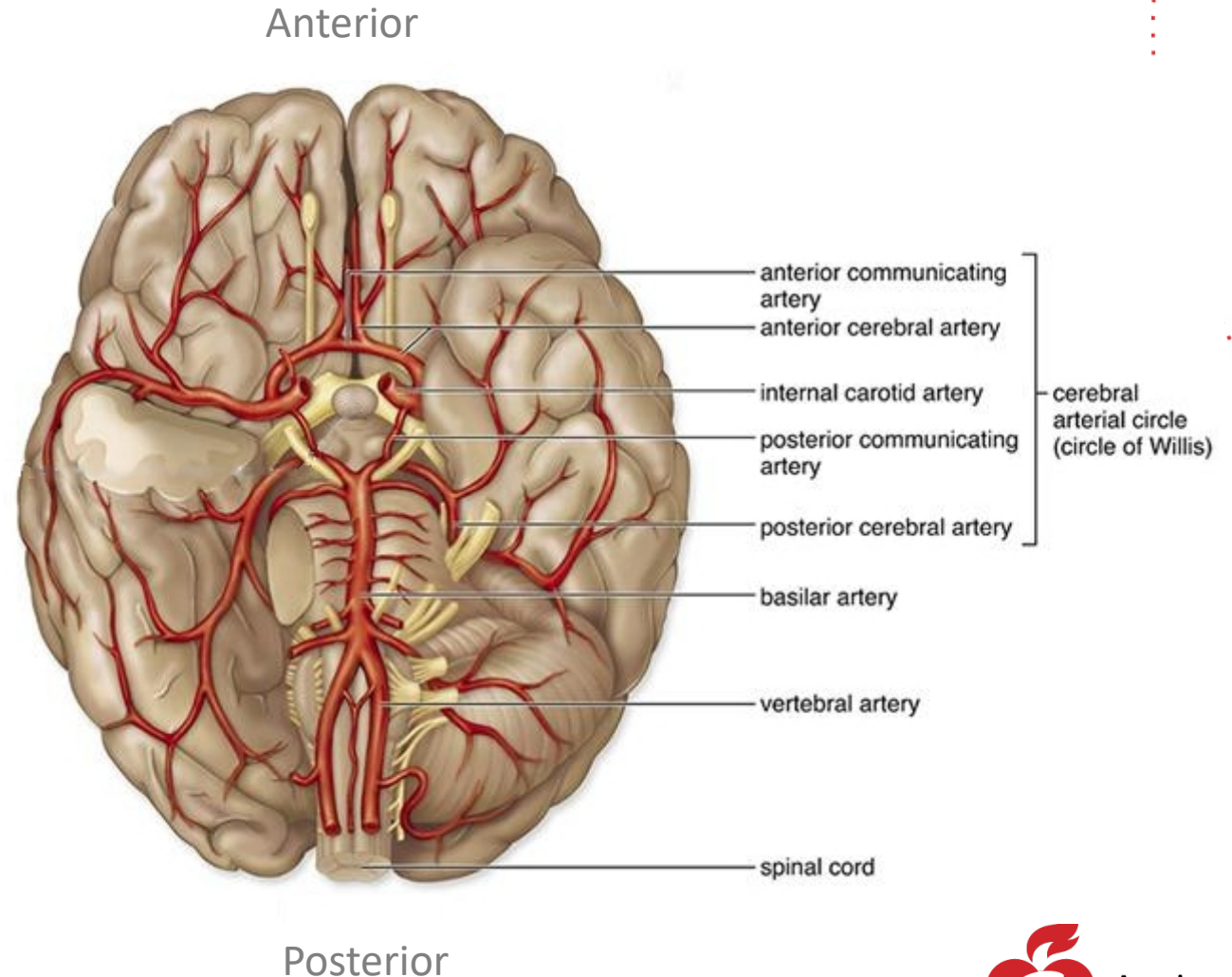
As the Clinical Coordinator for UMC EMS' licensed continuing education program, Chad oversees and teaches both in-house education and community outreach programs to EMS providers. He is a co-author to several research posters presented across the state and nation, generating interest and helping other EMS services advance their treatment protocols based on UMC EMS' experiences. Chad also directs the UMC EMS Outreach CE program that offers free, approved online continuing education to EMS providers in Texas and NREMT recertification candidates throughout the United States.

Closer to home, he and his team of educators teach the American College of Surgeons' "Stop the Bleed" campaign to schools, organizations, and communities across Lubbock and the South Plains. Away from home, Chad represents EMS at the Governor's EMS and Trauma Advisory Council (GETAC). In addition, he has conveyed the concerns of many prehospital providers by testifying to the United States Sentencing Commission in Washington D.C. about the difficulties faced by synthetic cannabinoid use by the public. He continues to speak to students, parents, and the general public about these dangers that may be lurking within their own homes.



A REVIEW OF LARGE CEREBRAL VESSEL OCCLUSIONS

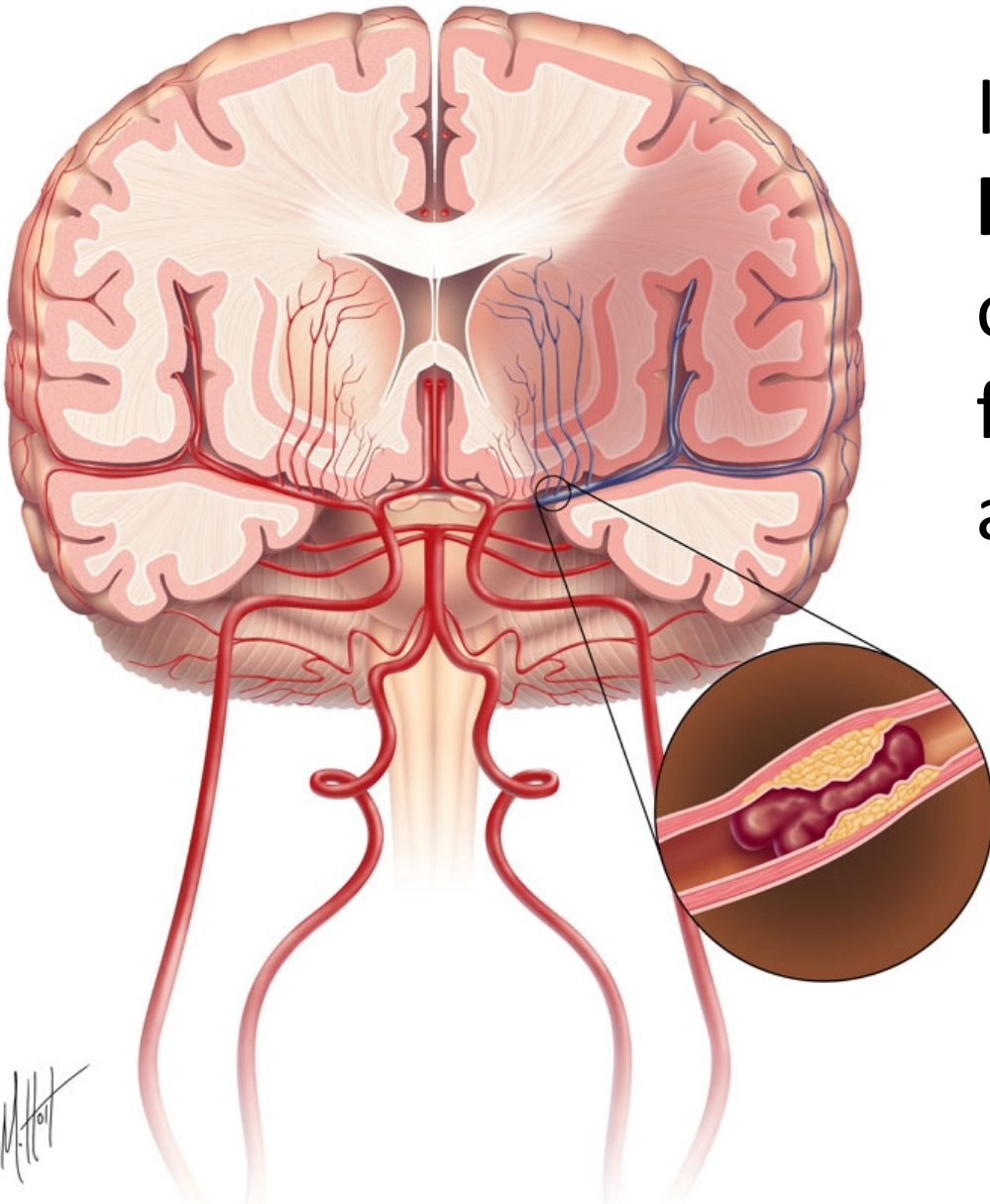
The cerebral arteries are similar any other arterial network in the body: A few large vessels branch out from the base and feed the many smaller diameter vessels winding throughout the brain.



A REVIEW OF LARGE CEREBRAL VESSEL OCCLUSIONS

If a thrombus occludes blood flow in a **large** cerebral vessel for a significant length of time, it can cause severe, permanent functional damage. This can drastically affect the patient's quality of life.

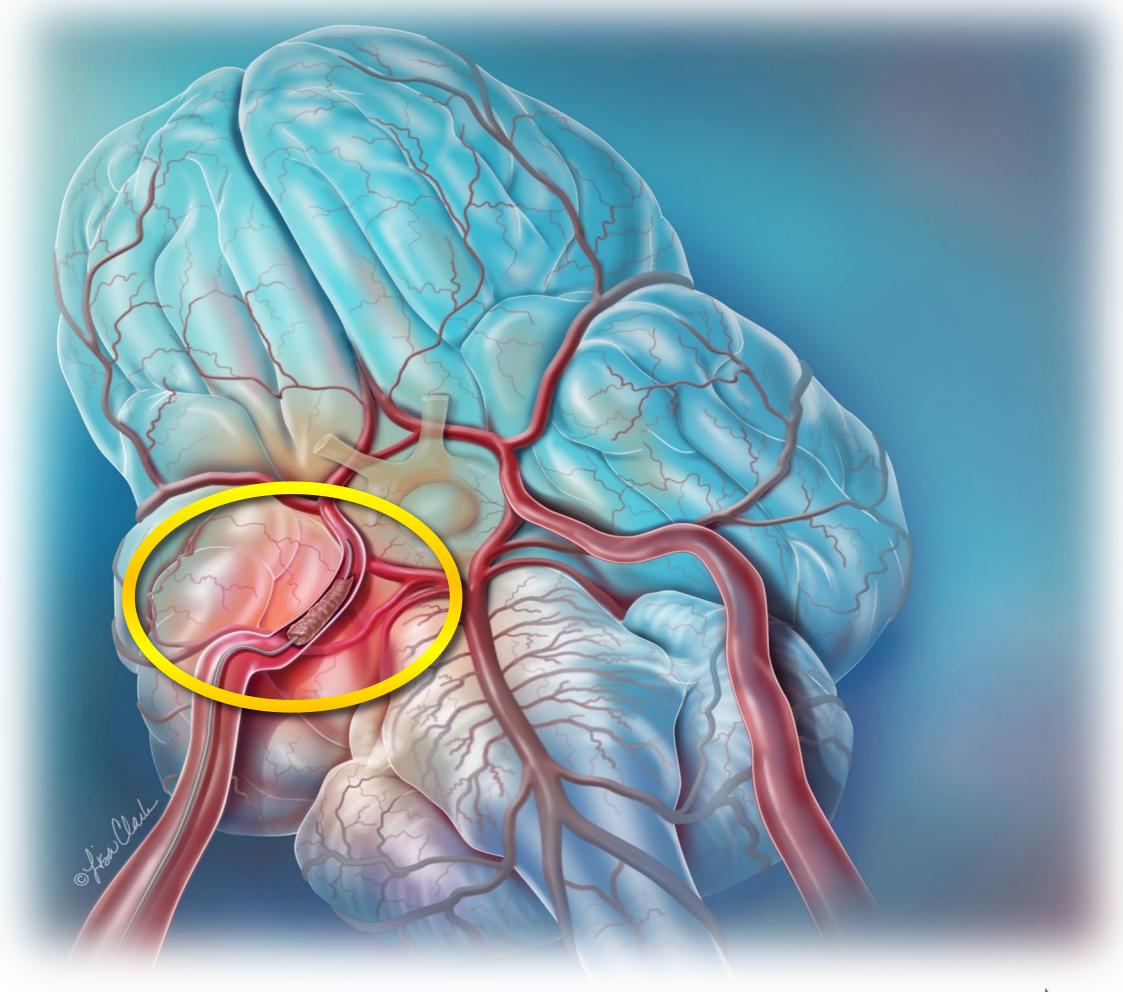
But we can avert this fate by treating soon enough and with appropriate interventions, **reducing the risk of permanent disability or death.**¹⁻⁵



TREATMENT OF LARGE VESSEL OCCLUSIONS

One treatment pathway for large vessel clot extraction starts with a controlled IV infusion of tPA to help begin the thrombus-breakdown process, which is then followed with mechanical or aspiration thrombectomy.

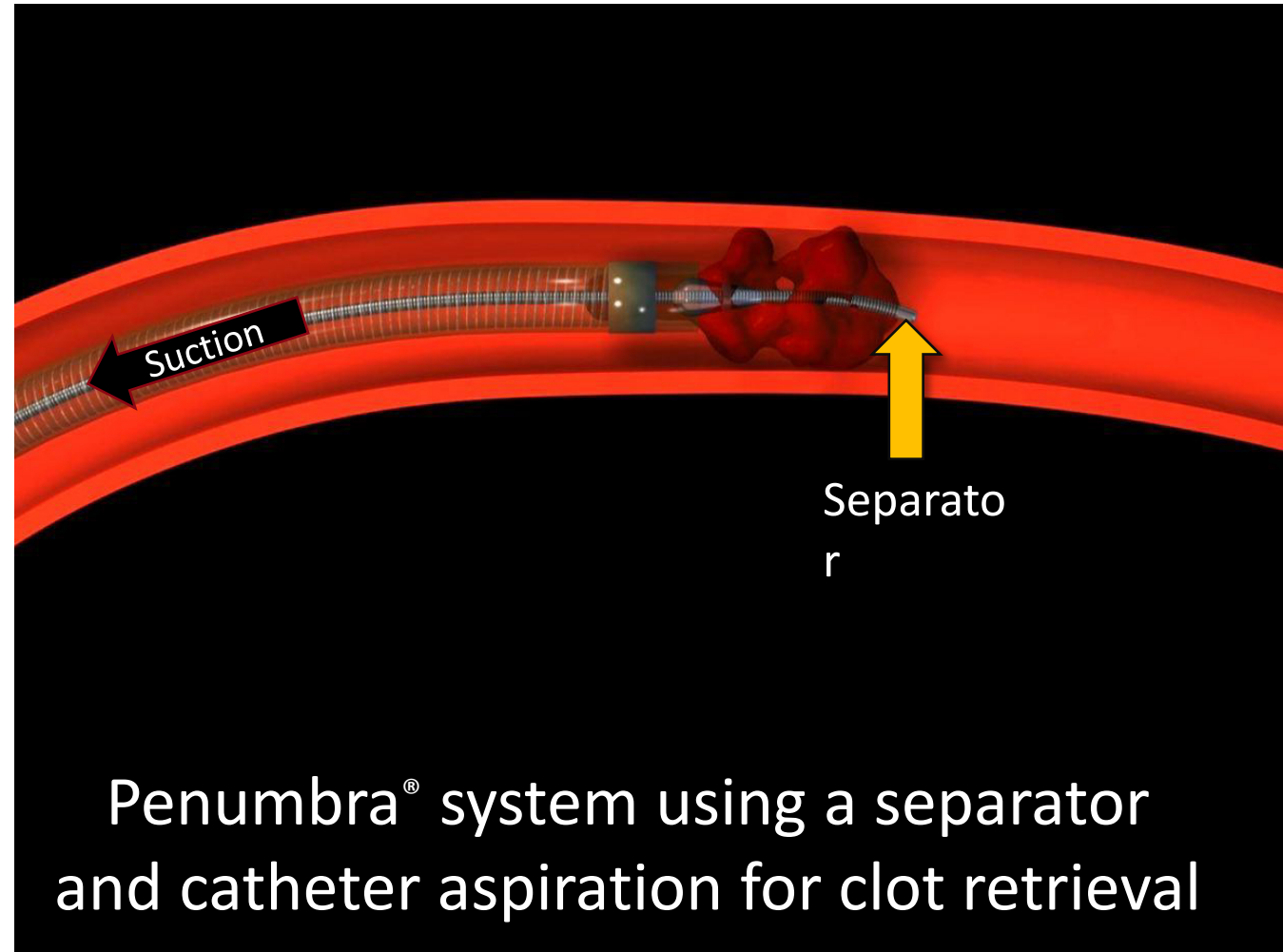
Both thrombectomy techniques introduce a catheter into the cerebral artery and physically remove the clot, facilitated by suction.



TREATMENT OF LARGE VESSEL OCCLUSIONS

One local stroke center uses the Penumbra[®] system with ACE catheters.

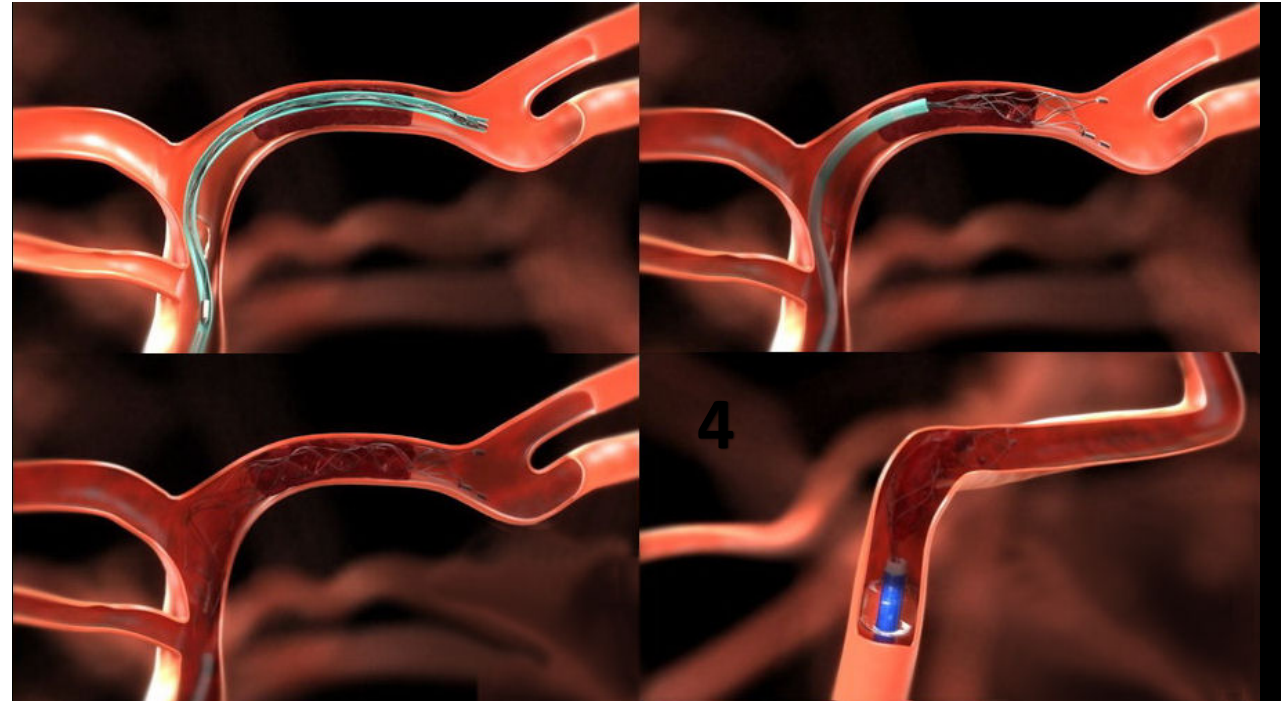
The catheter is threaded into the cerebral artery via femoral access. The “separator” wire residing within the catheter is pushed in and out of the clot to break it into smaller pieces. The clot pieces are then drawn out of the vessel and into the catheter with suction.



TREATMENT OF LARGE VESSEL OCCLUSIONS

The mechanical stent retrieval devices used by our local stroke centers include the Solitaire™ revascularization device and the Trevo XP Provue® system.

Basically, the device is threaded through the cerebral artery and the closed stent is then introduced through the clot. The stent expands, reperfusiones the vessel, and the clot is dragged back into the catheter with suction assistance.



Mechanical stent retrieval device

New hospital notification alerts

EMS now uses the VAN stroke scale to recognize the potential for a large vessel occlusion. This allows for early, specific emergency center notification for mobilization of appropriate teams and resources.

The emergency center is now notified of both a Cincinnati Stroke Scale assessment and a “**positive VAN**” alert, if the patient meets the criteria.



LARGE VESSEL OCCLUSION ASSESSMENT TOOLS: VAN

So... what is VAN?



Before explaining the VAN assessment procedure, take a look at the some of the current stroke assessment scales. See why this one was selected over the other prehospital stroke scale options.

THE NATIONAL INSTITUTE OF HEALTH STROKE SCALE (NIHSS)

Instructions	Scale Definition	Score
1a. Level of Consciousness: Choose a response even if a full evaluation is prevented by ET tube, language, trauma, etc.	0 = Alert; keenly responsive. 1 = Arousable by minor stimulation to obey, answer, or respond. 2 = Requires repeated stimulation to attend, or is obtunded and requires strong or painful stimulation to make movements. 3 = Responds only with reflex responses or totally unresponsive.	_____
1b. LOC Questions: Ask the month and his/her age. The answer must be correct - there is no partial credit for being close. Do not "help" the patient.	0 = Answers both questions correctly. 1 = Answers one question correctly (or dysarthria, intubated, foreign lang.) 2 = Answers neither question correctly.	_____
1c. LOC Commands: Ask to open and close eyes and to grip and release the non-paretic hand. Substitute another one step command if the hands cannot be used. Task can be demonstrated and then scored.	0 = Performs both tasks correctly (ok if impaired by weakness). 1 = Performs one task correctly. 2 = Performs neither task correctly.	_____
2. Best Gaze: Horizontal EOM tested by voluntary or oculoccephalic maneuver (Doll's).	0 = Normal. 1 = Partial gaze palsy. Abnormal gaze in one or both eyes. 2 = Forced deviation or total gaze paresis not overcome by the oculoccephalic maneuver (Doll's).	_____
3. Visual: Visual fields (upper and lower quadrants) are tested by confrontation, using finger counting or visual threat as appropriate. Patient must be encouraged, but if they look at.	0 = No visual loss. 1 = Partial hemianopia, quadrantanopia, extinction. 2 = Complete hemianopia. 3 = Bilateral hemianopia (blind including cortical blindness)	_____
4. Facial Palsy: Ask, or use pantomime to have show teeth, raise eyebrows and close eyes. Score symmetry of grimace in response to noxious stimuli in the poorly responsive or non-comprehending patient.	0 = Normal symmetrical movement. 1 = Minor paralysis (flattened nasolabial fold, asymmetry on smiling). 2 = Partial paralysis (total or near total paralysis of lower face). 3 = Complete paralysis-1 or both sides (no facial movement upper/lower face)	_____
5. Motor Arm: Extend the arms (palms down) 90 degrees (if sitting) or 45 degrees (if supine) and the leg 30 degrees (always tested supine). Drift is scored if the arm falls before 10 seconds. Can encourage using voice and pantomime.	0 = No drift for 10 seconds. 1 = Drift but does not hit bed or other support. 2 = Some effort against gravity, but can't maintain-falls to bed. 3 = No effort against gravity, limb falls. 4 = No movement. X = Amputation, joint fusion explain:	_____
	5a. Left Arm 5b. Right Arm	_____
6. Motor Leg: Leg extended 30 degrees (always test supine). Drift is scored if falls before 5 seconds. Can encourage using voice and pantomime.	0 = No drift, leg holds position for full 5 seconds. 1 = Drift but does not hit bed. 2 = Some effort against gravity, but can't maintain-falls to bed. 3 = No effort against gravity, leg falls to bed immediately. 4 = No movement. X = Amputation, joint fusion explain:	_____
	6a. Left Leg 6b. Right Leg	_____

The NIHSS is used in the hospital setting to determine the severity of stroke signs and to help guide stroke therapy decisions.

It is an 11-item patient assessment with a maximum score of 42. A score of zero suggests no deficits.

1 to 4:	Minor stroke
5 to 15:	Moderate stroke
16 to 20:	Moderate to severe stroke
21 to 42:	Severe stroke



NIHSS IS NOT *QUITE* PREHOSPITAL FRIENDLY.

But, the NIHSS is not a rapid test, so becomes a problem for the **prehospital setting**. The **Cincinnati Prehospital Stroke Severity Scale (CPSSS)** was developed as a three-item scale based on the NIHSS. It was found to be very useful in the prehospital setting, with particular sensitivity towards anterior circulation strokes.⁶

Benefits:

- Rapid
- Easy to remember
- No calculations

Cincinnati Pre-hospital Stroke Scale

1. FACIAL DROOP: Have patient show teeth or smile.



Normal:
both sides
of the face
move equally



Abnormal:
one side of
face does not
move as well
as the other
side

2. ARM DRIFT: Patient closes eyes & holds both arms out for 10 sec.



Normal:
both arms
move the
same or both
arms do not
move at all



Abnormal:
one arm does
not move or
drifts down
compared to
the other

3. ABNORMAL SPEECH: Have the patient say "you can't teach an old dog new tricks."

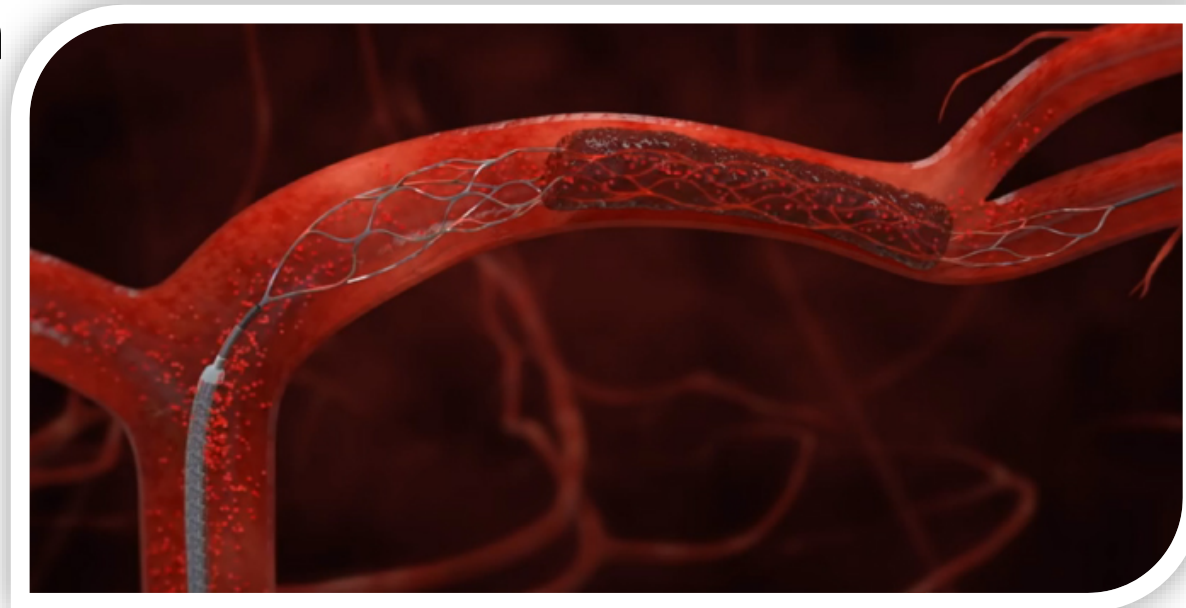
Normal: patient uses correct words with no slurring **Abnormal:** patient slurs words, uses the wrong words, or is unable to speak

INTERPRETATION: If any 1 of these 3 signs is abnormal, the probability of a stroke is 72%.

BUT MEDICINE IS ALWAYS LOOKING TO IMPROVE...

But, the Cincinnati Stroke Scale doesn't specifically target large vessel occlusions... it recognizes *generalized* stroke signs.

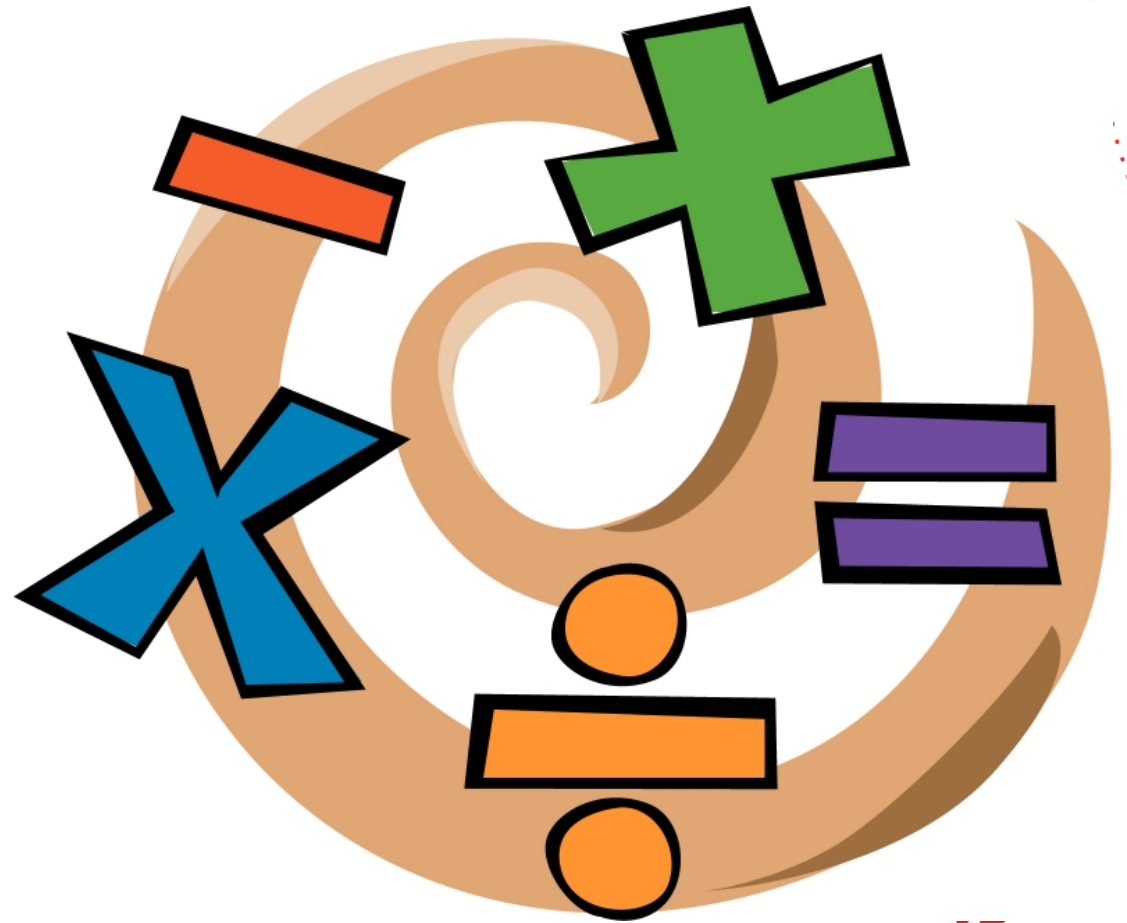
Over the years, several prehospital stroke scales have been researched, designed, and tested clinically. The latest ones focus on large vessel occlusion, since the newest treatment options have produced great functional outcomes for these patients.



LOTS OF STROKE SCALES OUT THERE. SOME ARE COMPLEX.

Some of these other stroke scales still require adding up scores, others take some extra time to assess, and a few don't offer an easy way to remember the assessment points.

Checklists and score boxes are not ideal solutions for the prehospital environment.



LOOKING AT A FEW OF THE STROKE ASSESSMENT TOOLS OUT THERE:

Acronym:	Stroke Assessment Tools:
3I-SS	Three Item Stroke Scale
CPSSS	Cincinnati Prehospital Stroke Severity Score
FAST-ED	Field Assessment Stroke Triage for Emergency Destination
Hemiparesis	Assessment for unilateral paralysis
LAMS	Los Angeles Motor Scale
LEGS	Texas Stroke Intervention Prehospital Stroke Severity Scale
RACES	Rapid Arterial Occlusion Evaluation Scale
VAN	Vision, Aphasia, and Neglect

And of course, the emergency department standard for stroke assessment scores:

NIHSS	National Institute of Health Stroke Scale
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