

**More Refrains About Various Lanes
that Can Regain Brains:**

Updates on Stroke Care Innovations

EPISODE Trial Update Results

EPISODE-PS: hEad Pulse for Ischemic StrOke Detection

Prehospital Study

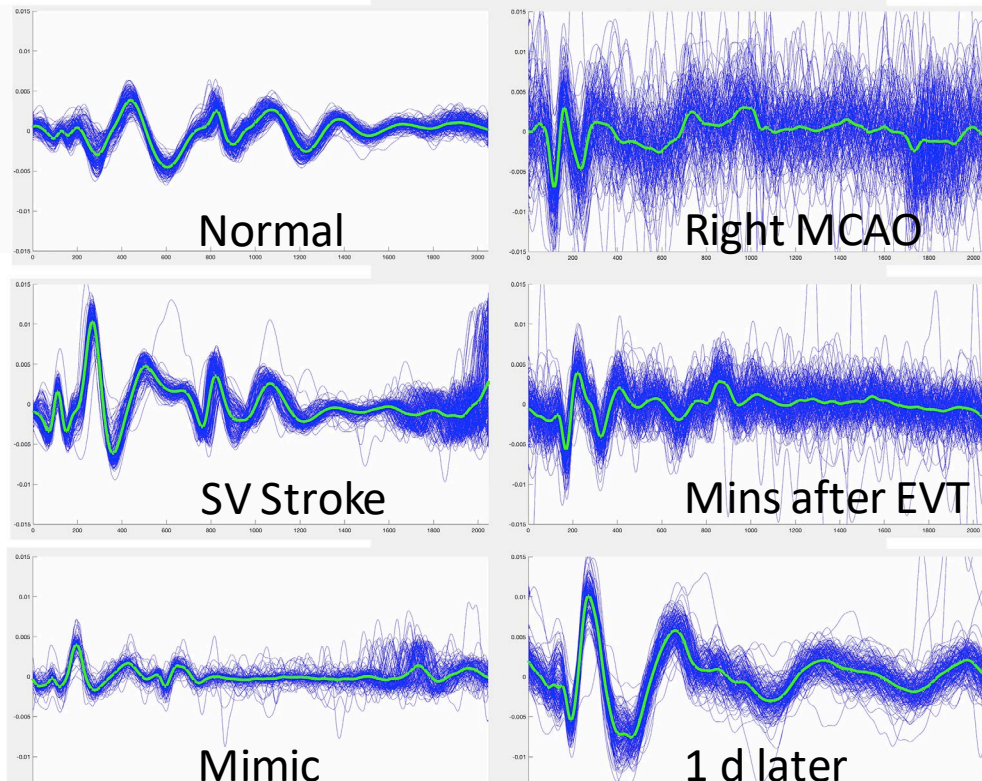


Robert B. Dunne, MD
Chief Medical Consultant, City of Detroit
Medical Director Detroit East Medical Control Authority
Professor Wayne State University SOM
rkdunne@wayne.edu

MindRhythm



Cranial Accelerometry: The headpulse



When combined with asymmetrical limb weakness

- Sensitivity: 91%
- Specificity: 93%

Launched Prehospital Trial April 2021

ORIGINAL WORK

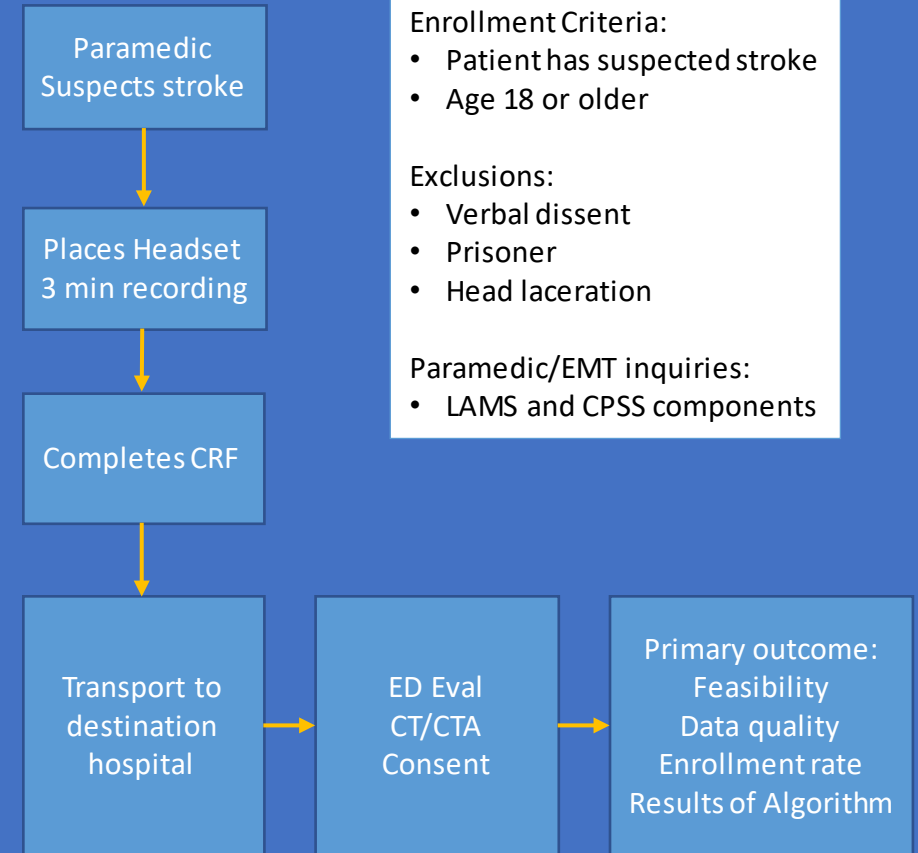
A Unique Signature of Cardiac-Induced Cranial Forces During Acute Large Vessel Stroke and Development of a Predictive Model



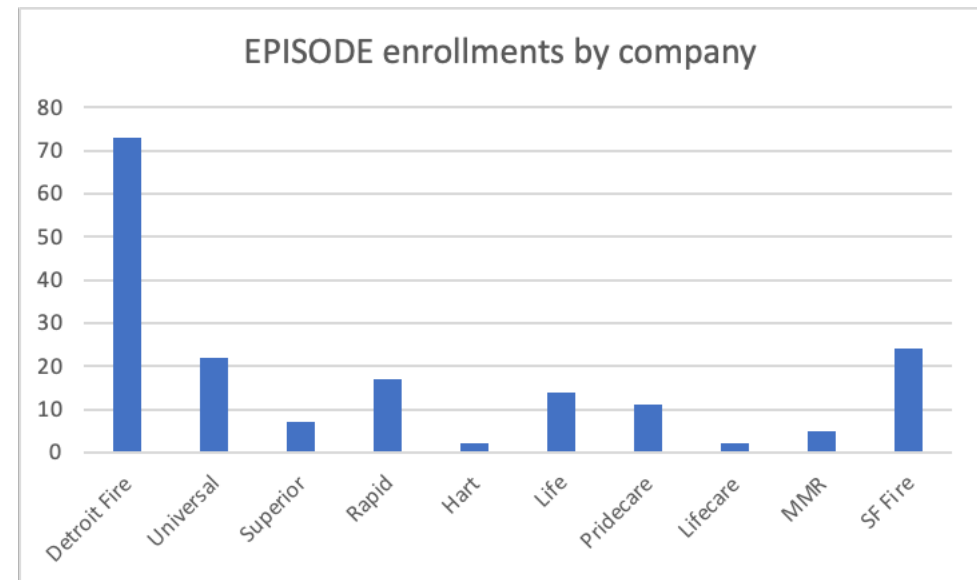
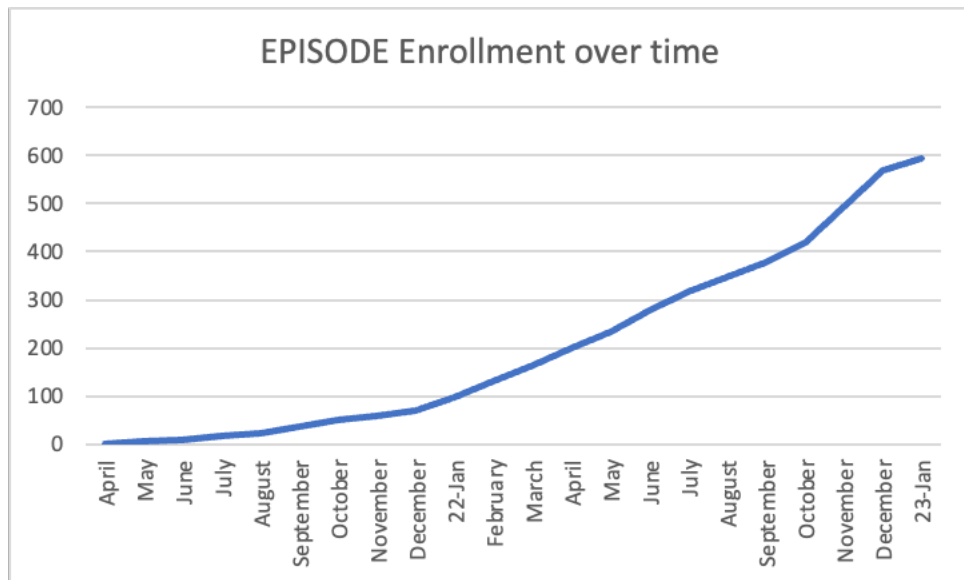
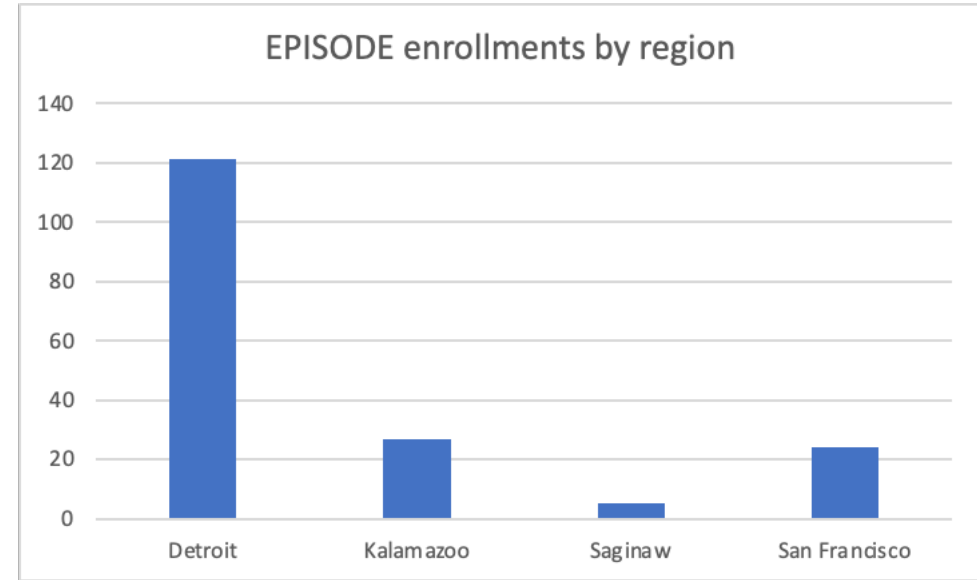
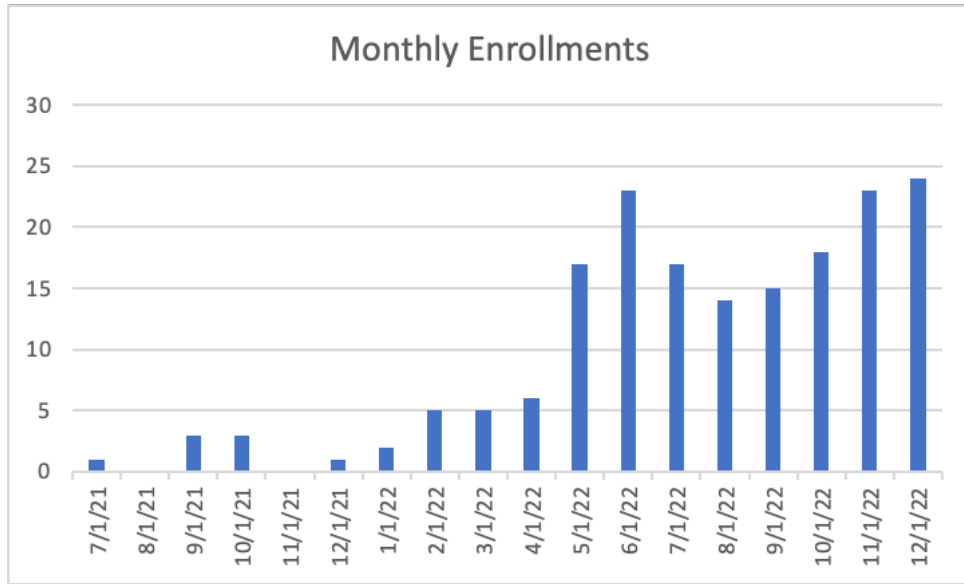
EPISODE-PS: Study Design

- Prospective, multi-center, blinded, observational study
- Prehospital, by EMT/Ps
- Suspected stroke subjects
- Cranial accelerometry recordings
- CT angiography was performed

Part-1: Gather pre-hospital data for algorithm



EPISODE-PS-COVID: hEad Pulse for Ischemic StrOke DEtection Prehospital Study during COVID-19 Pandemic



EPISODE-PS-COVID: Part 1 data



Detroit, Western Michigan, Saginaw
San Francisco County

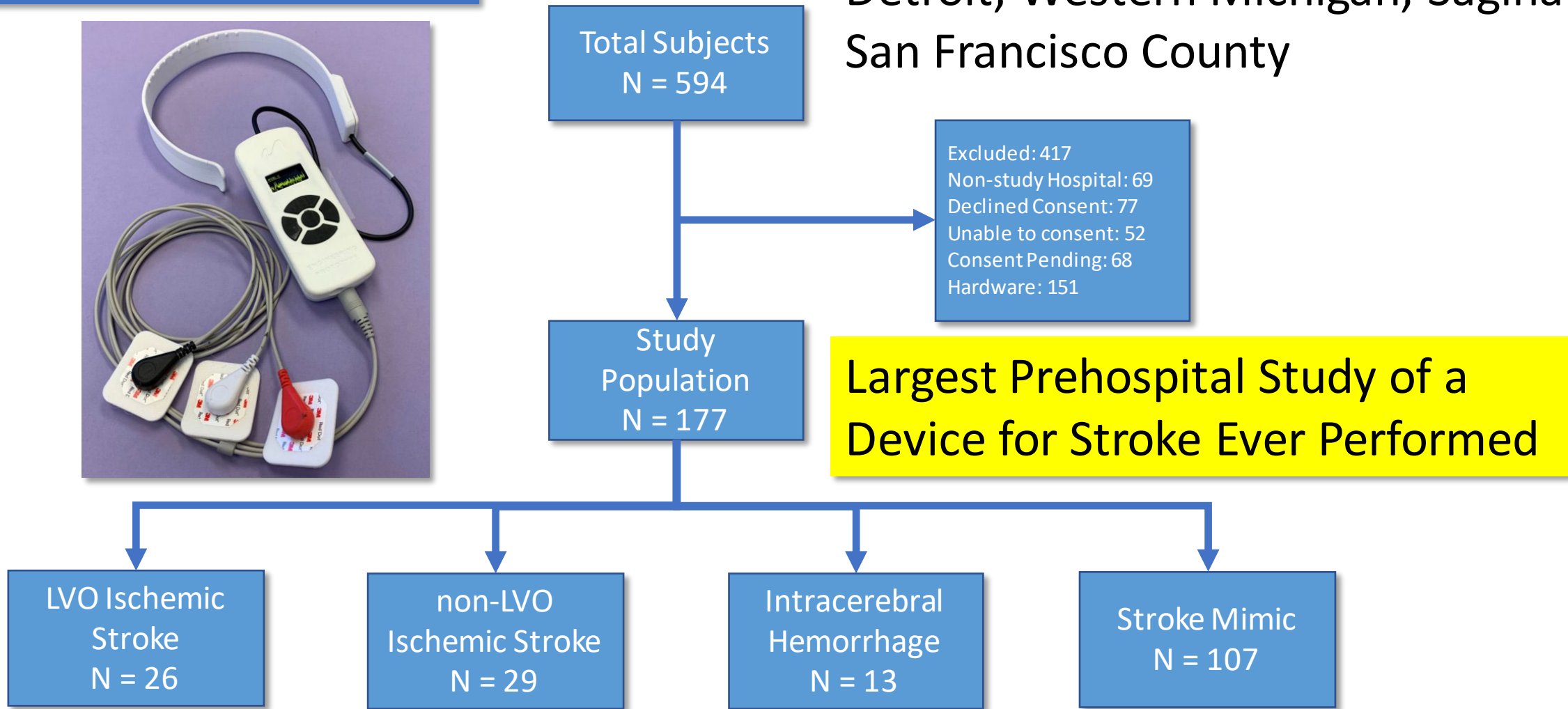


Figure 1: STARD Diagram of subjects. Non-study hospital are subjects who had a recording but were not transported to an IRB approved study hospital (data was deleted). Hardware issues included poor ECG recordings, excessive motion, and incorrect device placement. Subjects unable to consent left the hospital prior to study coordinator arrival.

EPISODE-PS-COVID: Preliminary Results Summary

- The device was 1.8 times more sensitive, and was more specific
- If used for prehospital triage, nearly twice as many LVO strokes would be identified and correctly triaged while fewer non-LVO stroke would be mis-triaged and care delayed

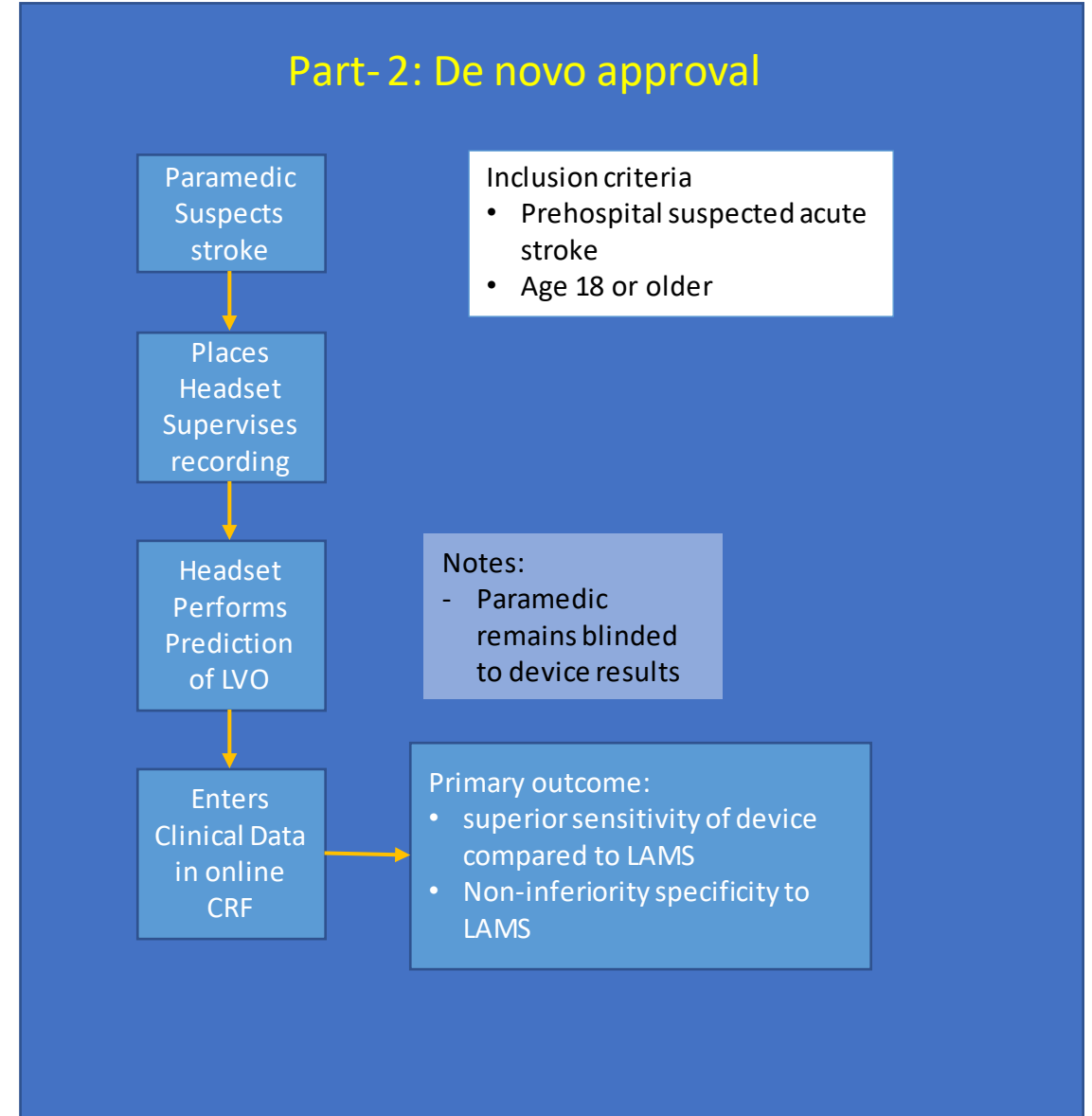
Category	Sensitivity	Specificity
Device Result	78%	99%
LAMS Score	44%	82%

P = 0.099 for superiority

	LAMS	Device	
False Positive	12	1	CSC
True Positive	4	7	
False Negative	5	2	PSC
True Negative	55	82	

EPISODE-VS: hEad Pulse for Ischemic StrOke DEtection Validation Study

- Pivotal Trial
- Working on final algorithm
- Headsets will be programmed, and part 2 trial will start
- Headset will complete and encrypt its result
- Trial will last 3-6 months



EPIOSODE-PS

Head Pulse For Ischemic Stroke Detection Prehospital Study During COVID-19 Pandemic

End of Part 1

James H. Paxton¹, John M. Wilburn¹, Stefanie L. Wise², Howard A. Klausner³, Matthew T. Ball³, Robert B. Dunne⁴, K. Derek Kreitel⁵, Larry F. Morgan⁶, William D. Fales⁶, Wade S. Smith⁷

1-Department of Emergency Medicine, Wayne State University School of Medicine, Detroit, Michigan

2- Department of Emergency Medicine, Detroit Receiving Hospital, Detroit, Michigan

3- Department of Emergency Medicine, Henry Ford Hospital, Detroit, Michigan

4- Department of Emergency Medicine, St. John Hospital and Medical Center, Detroit, Michigan

5- Department of Radiology, Western Michigan University Homer Stryker MD School of Medicine, Kalamazoo, Michigan

6- Department of Medicine, Western Michigan University Homer Stryker MD School of Medicine, Kalamazoo, Michigan

7- Department of Neurology, University of California, San Francisco

Strokes of Genius For CVAs

C. J. Winckler MD, LP

David Miramontes MD, EMTP



How Can We Regain Brain Lane?



2023 First There First Care Conference

PROGRAM AGENDA

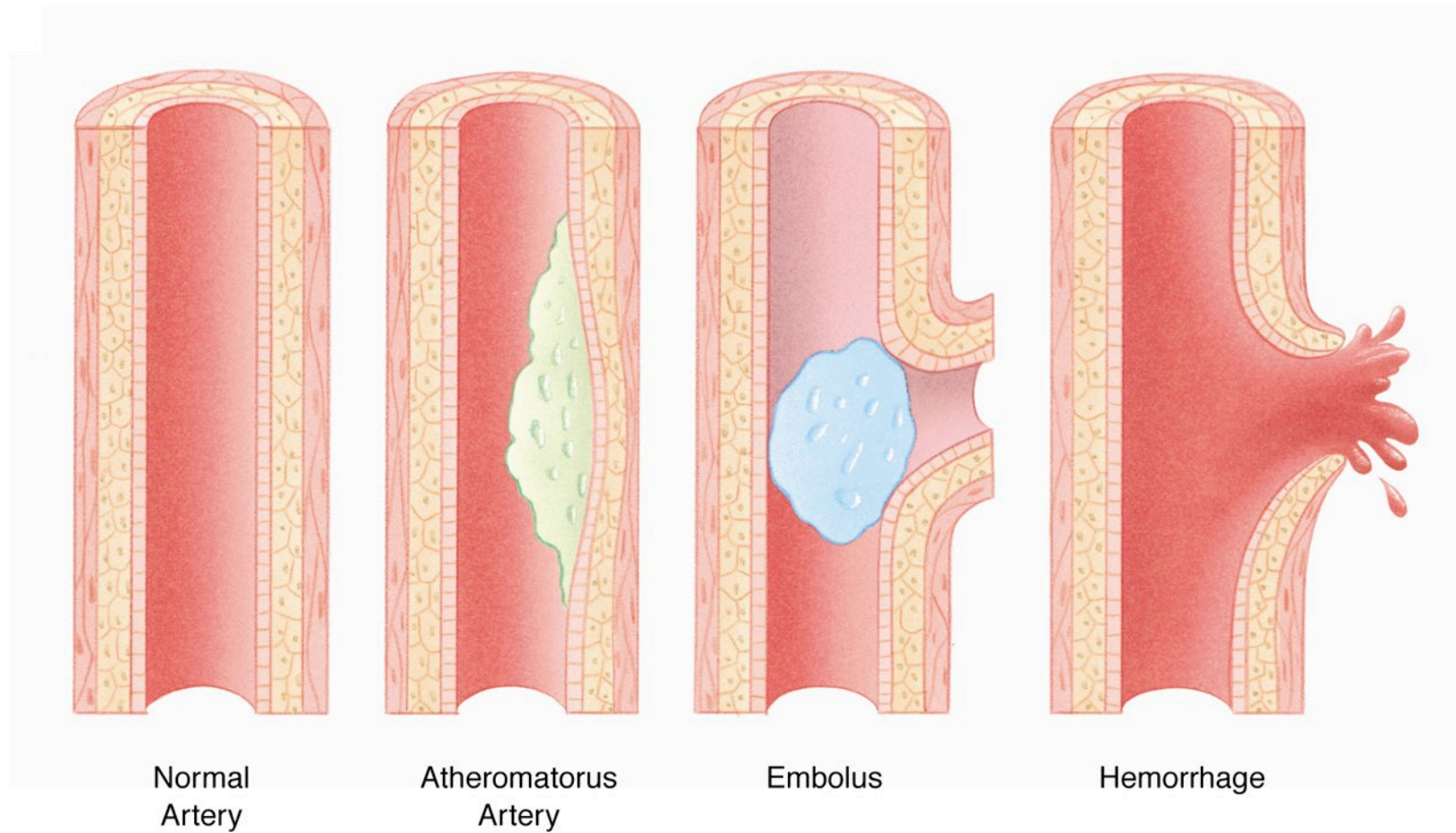
EMS STATE OF THE SCIENCE: XXIV
A Gathering of Eagles

Thursday & Friday
June 15th and June 16th
2023
Hard Rock Resort and Casino
Hollywood, Florida, USA

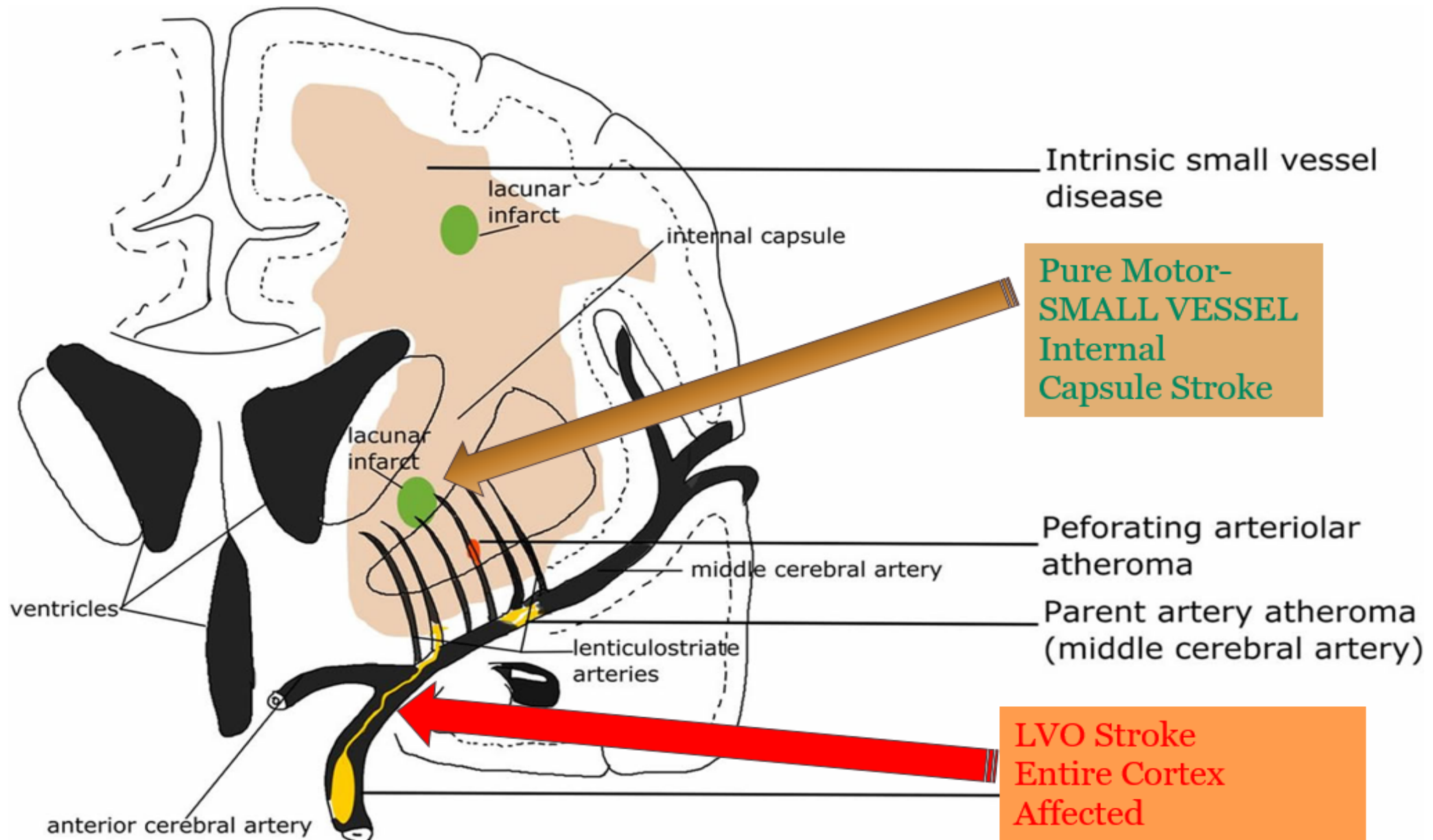
* Provided for the Member and Most of All the Attendees! Our Staff Right for the Job, the Industry, the Patients and Friends... and to Many Others to Name! We Salute You, The Family! We Thank You for the First There for People from Close to Those who serve at the Front! Many Others who help to facilitate and coordinate. Thank you for your service!

"Welcome Back My Friends To The Show That Never Ends"

Etiology Overview



87% ischemic 13% Hemorrhagic



Intrinsic small vessel disease

Pure Motor-SMALL VESSEL Internal Capsule Stroke

Peforating arteriolar atheroma

Parent artery atheroma (middle cerebral artery)

LVO Stroke Entire Cortex Affected

lacunar infarct

internal capsule

lacunar infarct

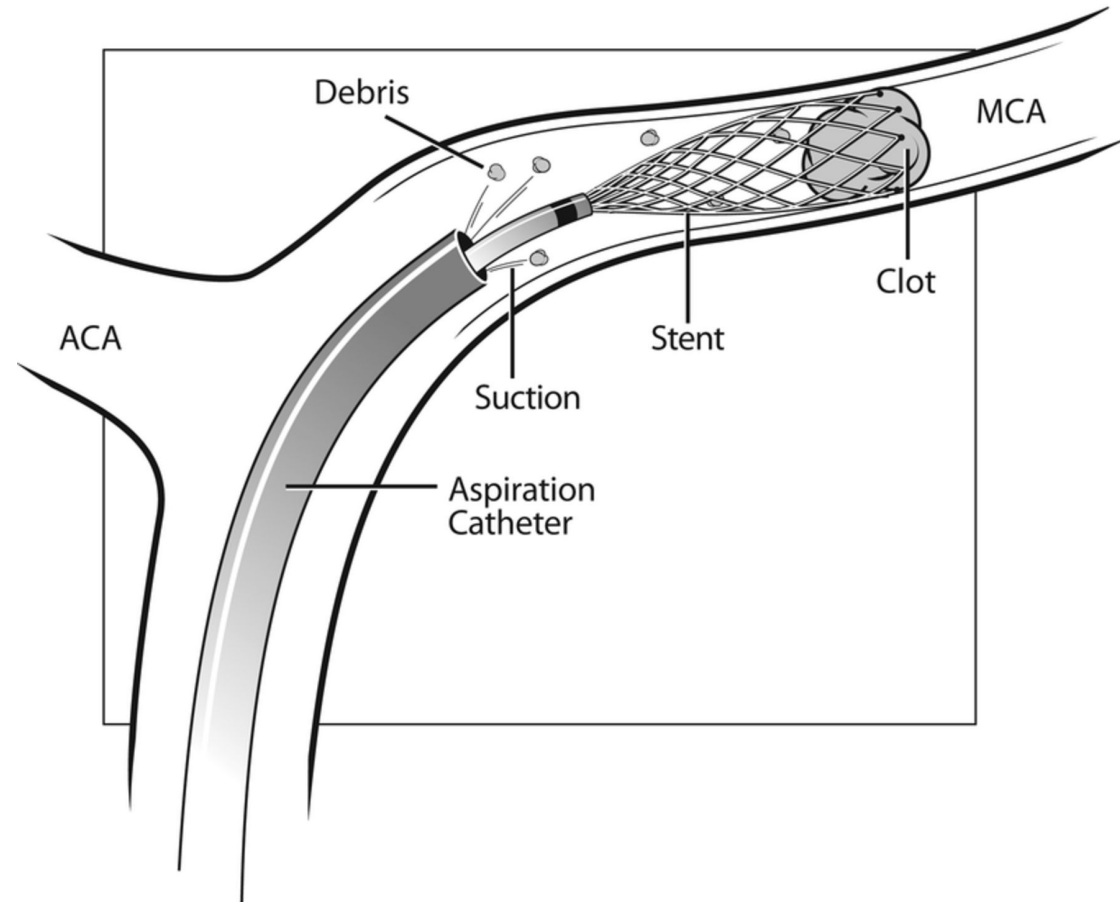
middle cerebral artery

lenticulostriate arteries

ventricles

anterior cerebral artery

Mechanical Thrombectomy with Combined Stentriever and Aspiration ("Solumbra technique")



SCREEN with **BEFAST** –then Check Severity with **VAN**

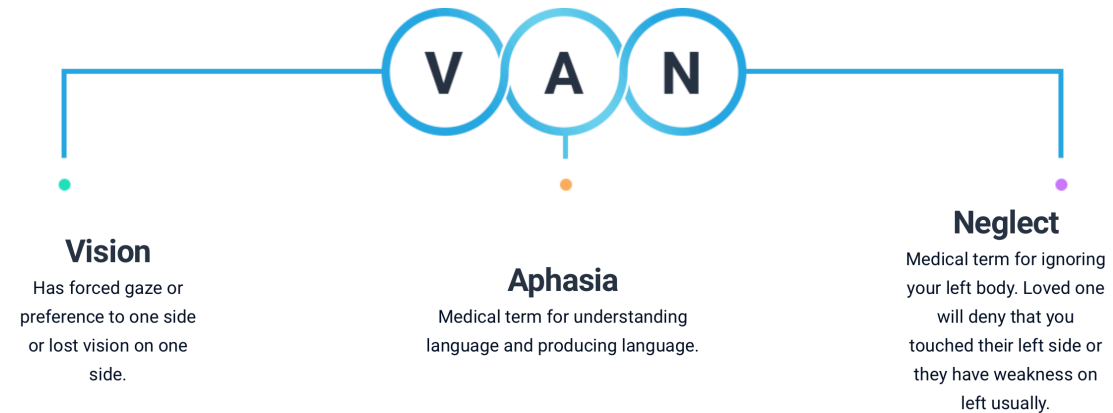
Is it Really a Stroke?

If someone has one or more of these stroke symptoms, call 911 immediately:

- B Balance** – Is there a sudden loss of balance or coordination?
- E Eyes** – Is there persistent blurred vision and/or sudden trouble seeing?
- F Face** – Ask the person to smile. Is one or both sides of the face drooping?
- A Arms** – Ask the person to raise both arms. Does one side drift downward? What about weakness or numbness on one side?
- S Speech** – Does the person have slurred or garbled speech? Can he/she repeat a simple phrase?
- T Time** – Call 911, get medical help immediately. Also, take note of when symptoms began.

Our Advanced Comprehensive Stroke Center is available 24/7 to provide leading-edge care.

Have Arm Weakness ??



Do You have ARM WEAKNESS ?

Then VAN

+ Vision = Patient looking preferentially to one side

*Gaze usually away from the side of weakness

*Vision loss usually same side as weakness (2 fingers left, 1 finger right)

+ Aphasia = Patient looks at simple objects but can't name them (pen, watch), can't follow commands (close eyes, make fist)

*Usually goes with right sided weakness

+ Neglect = Patient ignores left side when both sides are touched simultaneously

*usually goes with left sided weakness

Neglect Step Testing:

With eyes closed, ask patient to say "left, right, or both" when arms are touched.

Touch right, then left, then both together, asking for a response after each stimulus.

****Neglect is positive when patient is only able to identify that the right side was touched, when in fact both sides were touched at the same time****

****Brainstem stroke should be considered with decrease LOC and impaired eye movements/diplopia****

Information needed to call triage:

Pt name / Age / DOB / Sex / LKN 00:00 / VAN findings / ETA / Call back number

Regional Stroke Alert Criteria

One or more findings on either the Cincinnati Pre-hospital OR BEFAST Stroke Assessment

Stroke:

Cincinnati Pre-Hospital

- Facial Droop
- Arm Drift--Assess for LVO
- Speech

OR

BEFAST Stroke Assessment

- Balance
- Eyes
- Facial Droop
- Arm Drift--Assess for LVO
- Speech

--AND--

Time--Last Known Well Time less than 6 hours.

--AND--

Blood Glucose: Between 60mg/dL – 600mg/dL.

** Per AHA Guidelines, for any STROKE criteria and transport time is less than 45 min, transport to nearest Stroke Center.

Large Vessel Occlusion (LVO):

If Unilateral Arm Weakness (Drift) from Stroke Assessment Plus Any One of the Following:

- Visual Disturbance
- Aphasia
- Neglect

--AND--

Last Known Well Time less than 24 hours.

--AND--

Blood Glucose: Between 60mg/dL – 600mg/dL.

**Per AHA Guidelines, for any Large Vessel Occlusion criteria and transport time is less than 45 min, transport to nearest Thrombectomy Ready or Comprehensive Stroke Center.

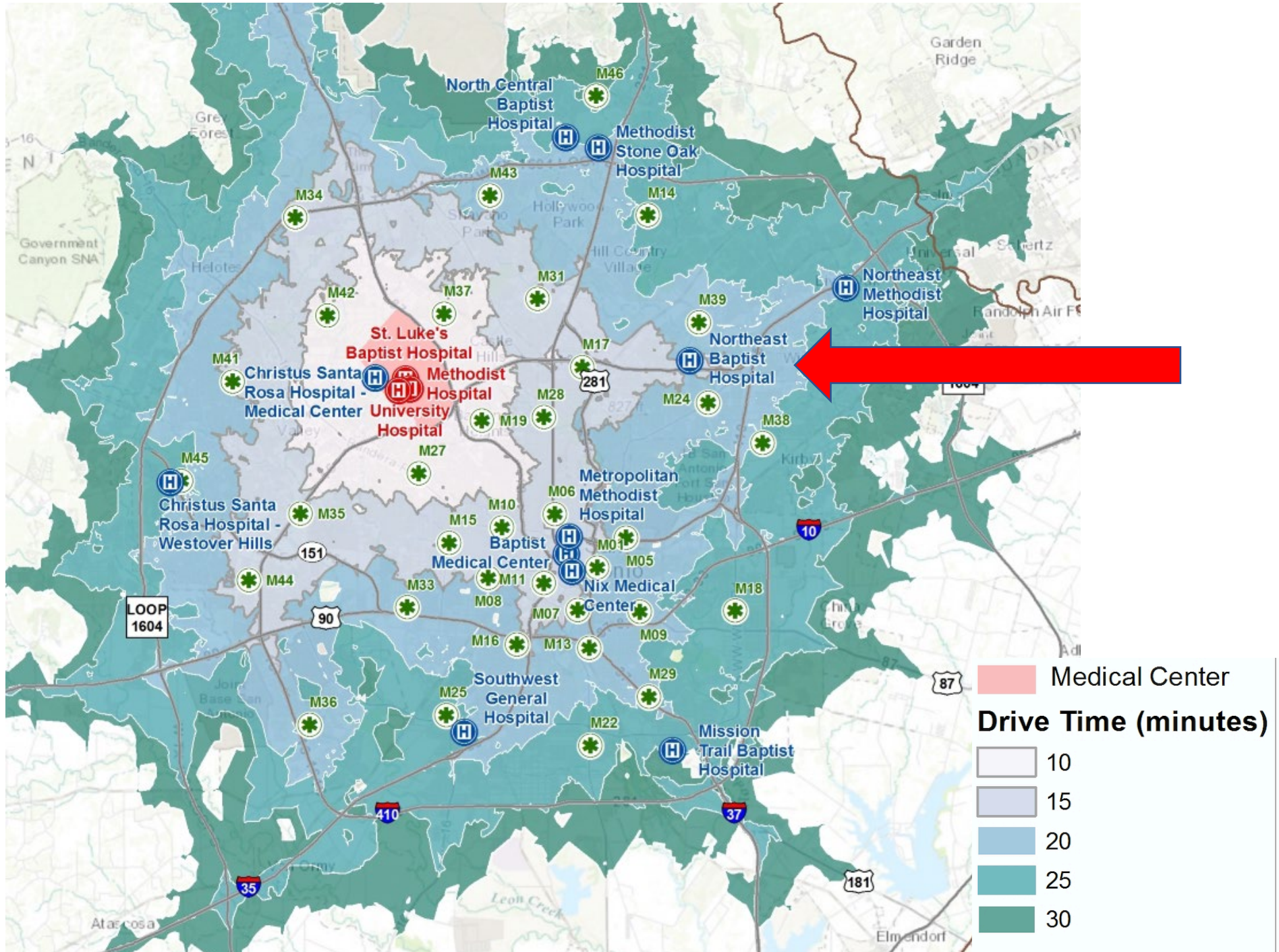
EMS Bypass to Comprehensive (CSC)

- VAN Positive < 24 hrs – BYPASS Closest Primary Stroke Center!!!!
- GO To CSC by Protocol

Call OMD On Call for Bypass

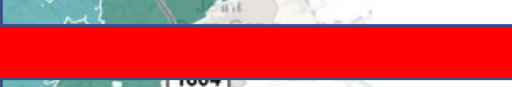
- “Really Bad Stroke”
- Intubated
- LOW GCS or Blown Pupil
- DAWN or Wake up strokes < 24 hrs
- Not eligible TPA- on anticoagulants





St. Luke's
Baptist Hospital
Methodist
Hospital
University
Hospital

Northeast
Baptist
Hospital



LOOP
1604

90

281

87

10

151

410

37

181

35

Paramedic utilization of Vision, Aphasia, Neglect (VAN) stroke severity scale in the prehospital setting predicts emergent large vessel occlusion stroke

Lee Birnbaum,¹ David Wampler ,² Arash Shadman,³ Mateja de Leonni Stanonik,³ Michele Patterson,⁴ Emily Kidd,⁵ Jeanette Tovar,⁶ Ashley Garza,⁶ Bonnie Blanchard,⁷ Lara Slesnick,⁸ Adam Blanchette,⁷ David Miramontes²

Birnbaum L, *et al. J NeuroIntervent Surg* 2020;**0**:1–5.
doi:10.1136/neurintsurg-2020-016054

Outcome	ELVO or any ICH			
	VAN		NIHSS ≥ 6	
	%	95% CI	%	95% CI
Sensitivity	82.9	74.3 to 89.5	85.7	77.5 to 91.8
Specificity	42.7	35.5 to 50.2	57.8	50.4 to 65.1
PPV	45.1	41.4 to 48.9	53.6	48.9 to 58.2
NPV	81.4	73.6 to 87.3	87.7	81.5 to 92.1
Accuracy	57.2	51.3 to 63.0	67.9	62.2 to 73.3

How to Regain Brain Lane— It Starts With Dispatch then Medic Unit

**Weakness
PLUS...**

V Vision

A Aphasia

N Neglect

“ACME General CSC, Medic 24 has a LVO Positive Stroke Alert...onset at 1530 hrs. eta is 12 minutes”

- **Bring stretcher toward the patient on arrival.**
- Get Report from Fire Crew
- Confirm Blood Glucose
- BEFAST Exam
- VAN Assessment
- **Get Witness Name and Cell # for Neurologist- Note in Pin Pad**
- Declare Stroke Alert and call receiving Comprehensive Stroke Center with brief radio report
- Load patient and do IV, EKG and other treatments enroute !!
- **Platinum 10 Minutes on scene !!!**

Final words

- **BE FAST**
- **Platinum Ten minutes** for EMS on scene
- **Rapid Assessment** for Stroke Alert Criteria
- **VAN Score**
- **CALL COMPREHENSIVE STROKE CENTER**
early while Loading patient.
- Do IV/ EKG and other procedures en route
- **MIST Hand OFF**



Albuquerque Fire Rescue Stroke Follow Up

Kimberly Pruett, MD



HEART Basic **E**valuation **A**nd **T**reatment for **S**troke



Stroke Follow Ups

- Referral from UNM
 - 24-72 hrs. of discharge
- Mon-Fri 0800-1530
 - 2 hours per visit
- 30/60/90 days
- 6 month
- 9 month
- One year
- Models C3 FIT study

Assessment Tools

- NIH Stroke Scale
- Stroke Impact Scale
- Moritsky Medication Adherence Scale
- PHQ-9 Depression Screening
- Modified Caregiver Strain Index
- Katz Index of Independence (ADLs)
- Fire and Fall Risk assessment



Coordination of Care

- Follow up appointments
 - Home health presence
 - Physical therapy
- Medication access
- Uber rides for appointments
- Food Security





Home Modifications

- Grab bars
- Wheelchair Ramps
- Bed rails
- Door Widening

Over 500
Assist
Devices
Installed



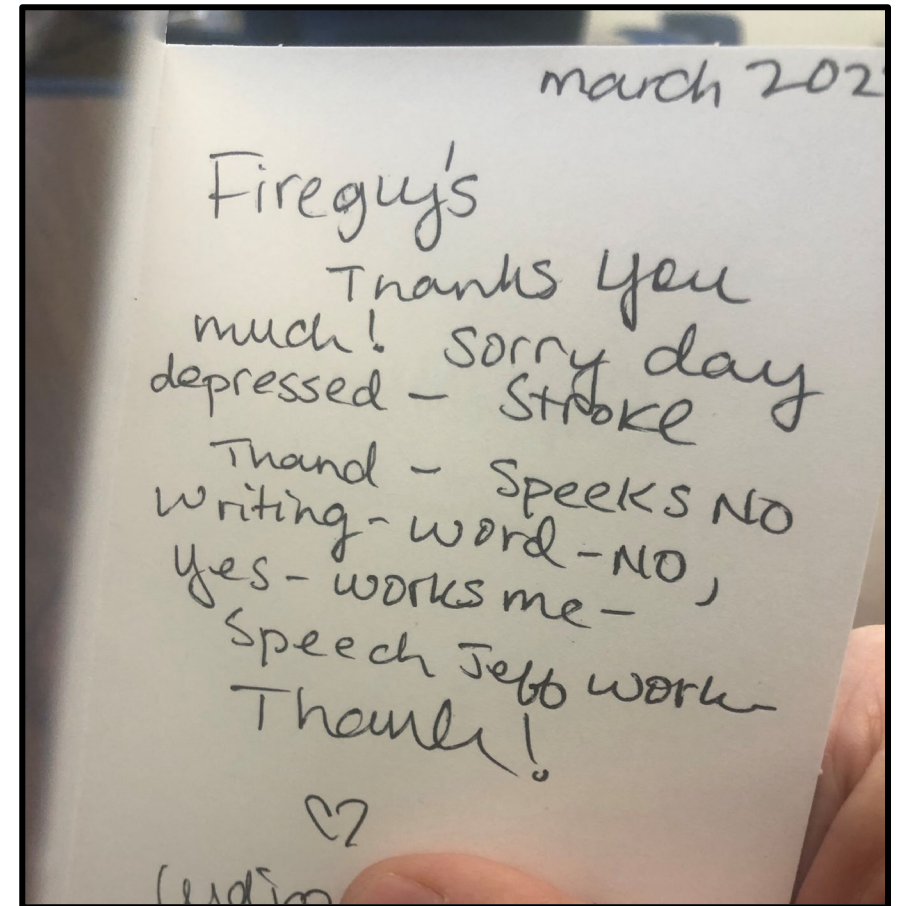
50% Reduction In Hospital Readmission Compared to Non-Enrolled Survivors!!

Totals:

- 356 Referred / 113 Enrolled
- 33 graduated so far
- 75% need home modifications

Results:

- Biggest impact on medication access and adherence
- Significant improvement in PHQ-9 depression score
- NIHSS improvement
- Only 20 EMS activations by enrolled patients in 2 years
- 37% decrease in mortality
 - 7 non-enrolled patients died (4.6%) vs 1 enrolled (2.5%)



Caregiver and Stroke Survivor Support Group



Questions