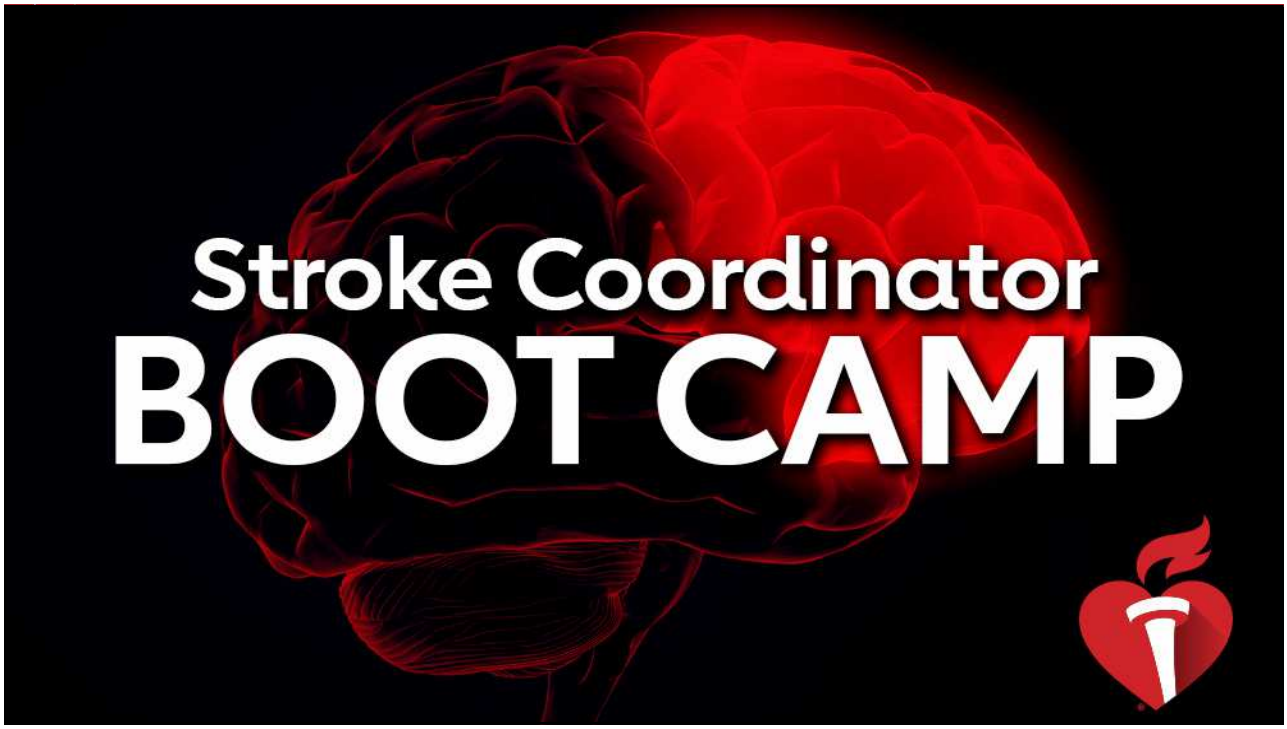

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CLINICAL RESEARCH UPDATE

Jeanie Luciano MS, RN, CNRN, CRNP, FAHA, SCRN

Martha Power MSN, RN, FAHA, SCRN

Sharon Heaton MA, BSN, RN EMT-P

2

DISCLOSURES

NONE

3

OBJECTIVE

IDENTIFY POTENTIAL RESEARCH OPPORTUNITIES FOR YOUR PRACTICE

4

TARGET: STROKE PHASE III

THE PRIMARY GOALS FOR TARGET: STROK PHASE III ARE:

ACHIEVE DOOR-TO-NEEDLE TIMES WITHII 60 MINUTES IN 85 PERCENT OR MORE OF ACUTE ISCHEMIC STROKE PATIENTS TREATED WITH IV THROMBOLYTICS.

ACHIEVE DOOR-TO-DEVICE TIMES (ARRIV TO FIRST PASS WITH THROMBECTOMY DEVICE) WITHIN 90 MINUTES FOR DIRECT ARRIVING PATIENTS AND WITHIN 60 MINUTES FOR TRANSFER PATIENTS IN 50 PERCENT OR MORE OF ACUTE ISCHEMIC STROKE PATIENTS TREATED WITH ENDOVASCULAR THERAPY.

STARTING IN 2020, HOSPITALS WILL HAVE THE OPPORTUNITY TO BE RECOGNIZED WITH A NEW TARGET: STROKE HONOR RC LEVEL. THE HONOR ROLL LEVELS WILL INCLUDE: TARGET: STROKE HONOR ROLL, TARGET: STROKE HONOR ROLL-ELI TARGET: STROKE HONOR ROLL-ELITE PLU TARGET: STROKE HONOR ROLL ADVANCE THERAPY.

WEBINAR APRIL 29TH 1-2PM

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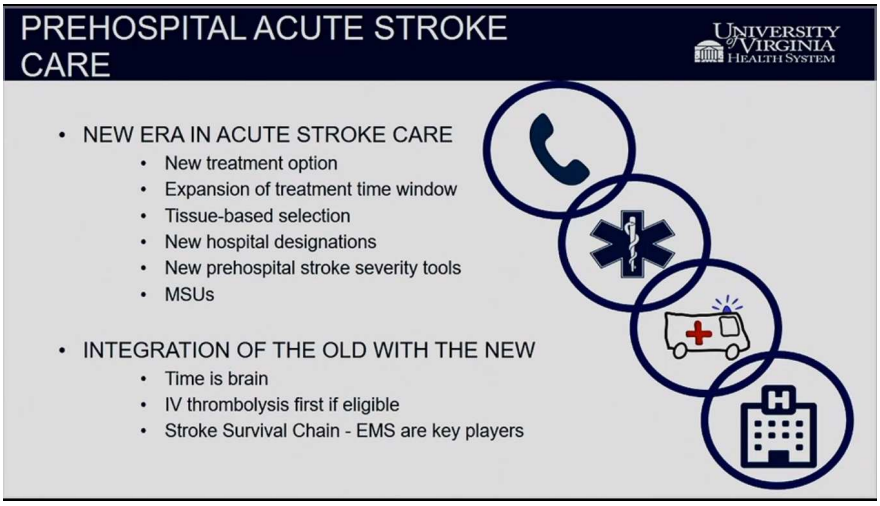
TELESTROKE



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TELESTROKE

Telestroke as a tool for Interfacility Endovascular Transfers

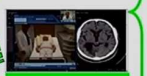
Lawrence R. Wechsler, M.D.
Chairman, Department of Neurology
University of Pittsburgh Medical School

Telestroke Triage of Acute Stroke

Emergency Medical Services (EMS)

± IV tPA

ASRH or PSC

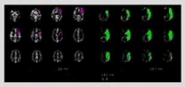


Telemedicine

Selection for EVT
- Time
  - LSW < 6 hrs
  - LSW < 24 hrs
  - Wakeup or unknown
- NIHSS
- CT / CTA / CTP
  - HDMCA
  - ASPECTS
  - RAPID
- Consent

Comprehensive Stroke Center

LSW < 4.5 hrs
NIHSS
Contraindications



UPMC LIFE CHANGING MEDICINE

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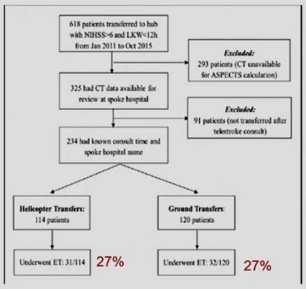
Transfers for EVT in Telestroke Network

- Transfers for EVT in an academic telestroke network 2011-2015
- 1 hub, 40 spokes
- Longer transfer times associated with lower probability of EVT
- 27% of eligible transferred pts underwent EVT



Regenhardt et al. Stroke 2018

UPMC LIFE CHANGING MEDICINE

Transfers for EVT in UPMC Telestroke Network 2017-2018

1760 Teleconsults

402 Transfers

99 EVT (25%)

1 Hub, 39 spokes

UPMC LIFE CHANGING MEDICINE

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Telestroke and EVT

- Thrombectomy volume increasing after positive trials
- Identification of eligible patients key to appropriate triage
- Telestroke facilitates triage from PSCs and MSUs

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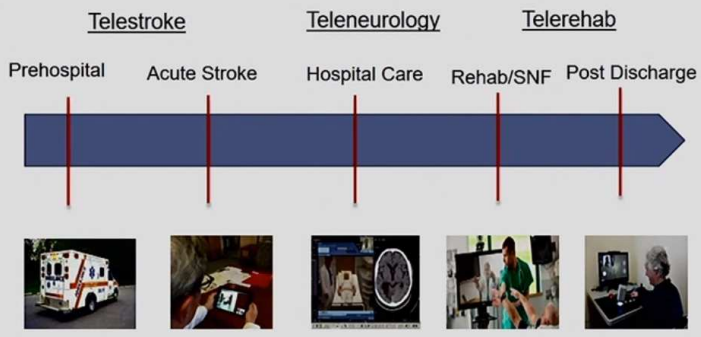
Telemedicine across the Continuum of Care



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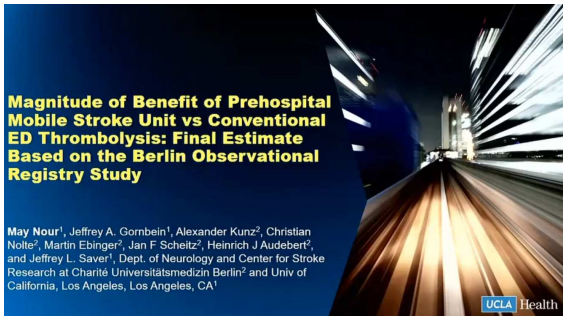
MSU



Conclusions

- This observational study, with adjustment for key prognostic features, estimates that out of every 1000 patients treated with MSU rather than conventional ED thrombolysis, 176 will have a less disabled final outcome, including 79 more who would be disability-free

11

11

Outcomes of Thrombolysis on Mobile Stroke Unit

Daisuke Shimbo, MD[1], Lila Sheikhi, MD[1], Deborah Kerrigan, MD[1], Kerri Maselli[1], Nicolas R. Thompson, MS[2], Andrew P. Reimer, RN[2], Fredric M. Hustey, MD[2], Jon W. Schrock, MD[3], Muhammad S. Hussain, MD[1], Ken Uchino, MD[1], Andrew N. Russman, DO[1]
on behalf of the Cleveland Pre-Hospital Acute Stroke Treatment Study Group

1 Cleveland Clinic, Cerebrovascular Center, Cleveland OH, USA.
2 Cleveland Clinic, Department of Quantitative Health Sciences, Cleveland OH, USA
3 Cleveland Clinic, Emergency Services Institute, Cleveland OH, USA.
4 MetroHealth Medical Center, Department of Emergency Medicine, Cleveland OH, USA

Cleveland Clinic

Conclusions

- Pre-hospital thrombolysis on MSU shortened the time to thrombolytic treatment compared to conventional EMS care
- MSU care was associated with improved functional outcomes in patients with acute ischemic stroke

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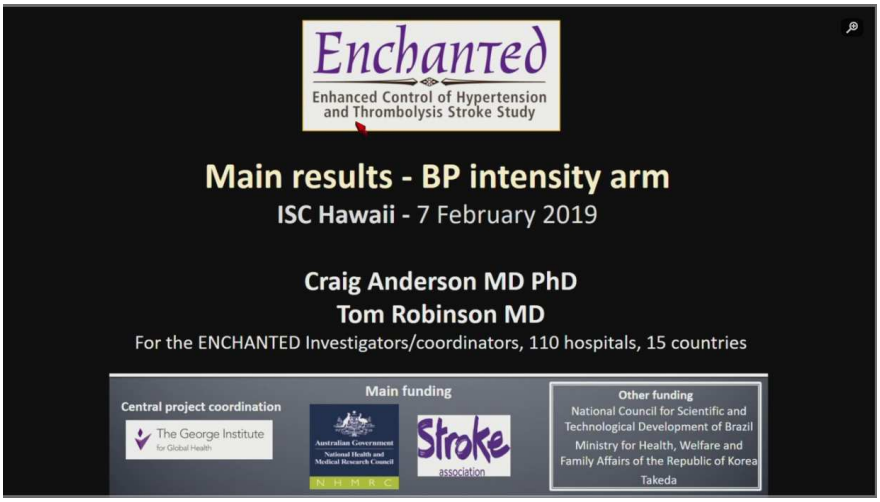

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Anderson C,Huang Y, Lindley RI et al. **Intensive bp reduction with IV thrombolysis therapy for acute ischaemic stroke (ENCHANTED):** *Lancet.* 2019; http://dx.doi.org/10.1016/S0140-6736(19)30038-8

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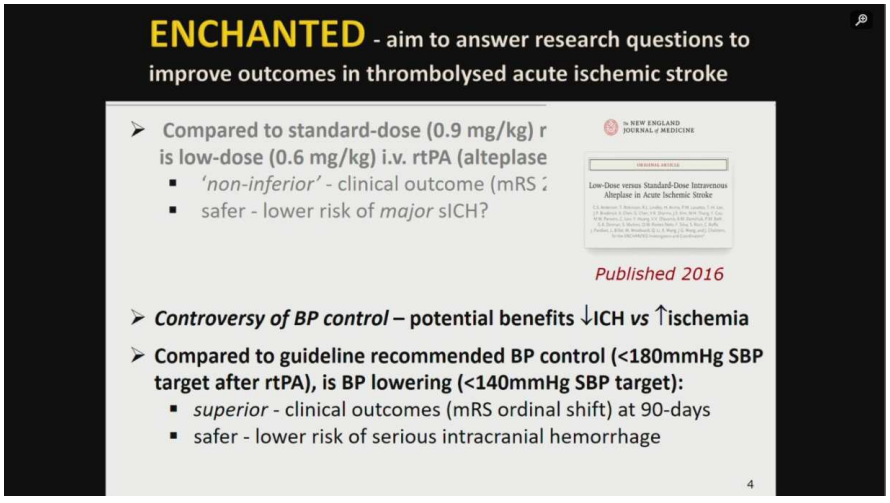

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Study Outline

Protocol & analysis plan – both published in *Int J Stroke*

- **Design:** Prosp. central randomized, open, blinded outcome (PROBE)
- **Patients:** *alteplase-eligible/treated acute ischemic stroke <4.5hr of onset*; SBP ≥150mmHg; treatment <6 hrs of stroke onset
- **Intervention** - *intensive* (SBP <130-140mmHg; <1hr + 72hrs), local agents; *guideline* – (SBP <180mmHg); background best practice + EVT
- **Primary outcome** – shift comparison mRS scores at 90 days
- **Safety outcomes** – any intracranial hemorrhage (key); other outcomes of symptomatic intracerebral hemorrhage (sICH) by standard criteria; all by central blind adjudication
- **Secondary efficacy outcomes** – Good recovery (mRS 0-1), other disability measures, health-related quality of life
- **Subgroups** - including interaction with rtPA dose
- **Quality control:** Central and site monitoring

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ENCHANTED

ENCHANTED - major findings

In lysis-eligible patients with acute ischemic stroke, more intensive BP lowering (<140mmHg target):

- ***Not shown to be superior*** to guideline-recommended BP lowering (<180mmHg) for primary disability outcome
- ***Consistency*** of neutral findings in all pre-specified subgroups
- ***Shown to be safe*** with respect to mRS scores and SAEs
- ***Evidence*** for lower risk of intracranial hemorrhage (including intracerebral hemorrhage)

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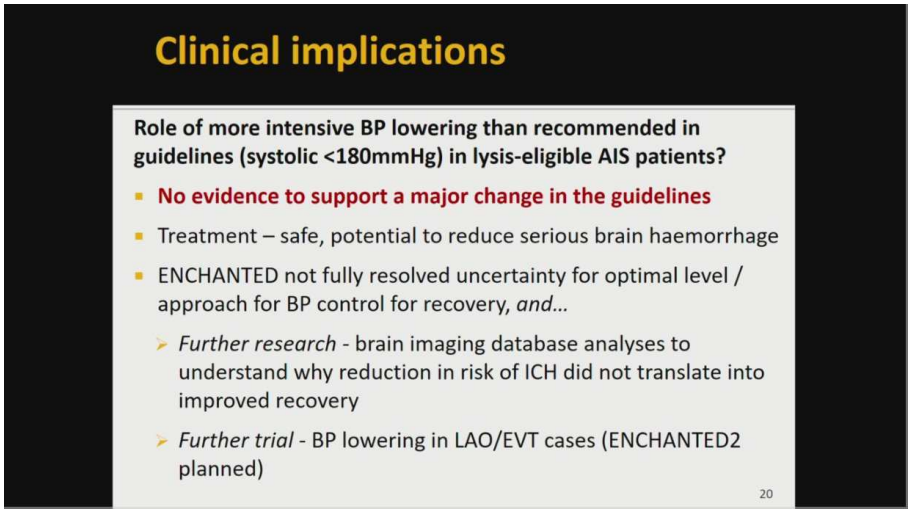

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EFFECT OF ALTEPLASE VS ASPIRIN ON FUNCTIONAL OUTCOME FOR PATIENTS WITH ACUTE ISCHEMIC STROKE AND MINOR NONDISABLING NEUROLOGIC DEFICITS: PRISMS TRIAL

313 PATIENTS ENROLLED AT 53 US STROKE CENTERS
(PLAN WAS TO ENROLL 948)

NIH STROKE SCALE 0-5 WITH ~~NONDISABLING~~ SYMPTOMS

STANDARD DOSE IV ALTEPLASE (0.9 MG/KG) VS ORAL ASPIRIN 325 MG GIVEN WITHIN 3 HOURS OF LAST KNOWN WELL

MEAN AGE 62, 46% WOMEN

MEDIAN TIME TO TREATMENT 2.7 HOURS

MEAN NIH STROKE SCALE AT BASELINE = 2

Khatri P, Kleindorfer DO, Devlin T, et al. Effect of alteplase vs aspirin on functional outcome for patients with acute ischemic stroke and minor nondisabling neurologic deficits: the PRISMS randomized clinical trial. *JAMA.* 2018;320:156-166.

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PRISM

PRIMARY EFFICACY OUTCOME WAS FAVORABLE FUNCTIONAL OUTCOMES DEFINED AS A MODIFIED RANKIN 0-1 AT 90 DAYS

FAVORABLE OUTCOME – NO DIFFERENCE

- 78.2 % in subjects who received IV alteplase
- 81.5 % in subjects who received aspirin
- Adjusted risk difference, -1.1%; 95% CI (not statistically significant)

SAFETY ENDPOINT: SYMPTOMATIC HEMORRHAGIC CONVERSION WITHIN 36 HOURS OF IV STUDY TREATMENT

- 3.2 % (5 subjects) in IV alteplase arm, 0% in aspirin arm
- Risk difference 3.3%; 95% CI, 0.8% -7.4%

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PRISM

"IT'S THE DATA THAT WE'VE GOT, AND IT'S UNDERPOWERED, BUT IT CERTAINLY HAS SWAYED ME TOWARDS TYPICALLY NOT TREATING THESE PATIENTS," DR. KHATRI TOLD TCTMD. IN DISCUSSIONS WITH HER COLLEAGUES, SHE ADDED, IT'S "GENERALLY BEEN THE CONSENSUS THAT WHEN YOU SEE THESE DATA, WHEN YOU SEE THAT THERE'S A REAL HEMORRHAGE RISK AND THERE ISN'T ANY SIGNAL OF BENEFIT, IT'S TOUGH TO JUSTIFY TREATING THEM."

POOJA KHATRI MD PRINCIPLE INVESTIGATOR UNIVERSITY OF CINCINNATI, OH

https://www.tctmd.com/news/iv-alteplase-no-help-minor-nondisabling-strokes-prisms-trial

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PRISM

"I'VE AGONIZED OVER THIS AT TIMES, AND I THINK THIS WILL MAKE ME MORE CONFIDENT IN MAKING THE DECISION NOT TO TREAT THESE PATIENTS. FOR THESE PATIENTS, TREATMENT WITH ASPIRIN ALONG WITH CLOSE MONITORING MAY BE AN APPROPRIATE COURSE OF ACTION."

WILLIAM POWERS UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Powers WJ. Intravenous alteplase for mild nondisabling acute ischemic stroke: a bridge too far? *JAMA.*2018;320:141-143.

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WHAT ABOUT LOW NIHSS BUT DISABLING SYMPTOMS?

THIS STUDY DOES NOT APPLY TO PATIENTS WITH DISABLING SYMPTOMS

AUTHORS STATE PATIENTS WITH LARGE VESSEL OCCLUSIONS REQUIRE FURTHER STUDY AS THEY MAY BE MORE LIKELY TO DETERIORATE

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EXTEND

EXTEND

Hypothesis

Ischaemic stroke patients selected with significant **penumbral mismatch** at 4.5 - 9 hours post stroke onset, or following 'Wake Up Stroke', will have improved clinical outcomes when given intravenous tPA compared to placebo

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EXTEND

EXTEND

Study Design

Phase III randomised, multicentre, double-blinded, stratified, placebo controlled trial (tPA 0.9mg/kg vs placebo) with imaging selection (CTP or MR Diffusion/Perfusion)

Stratified for time of randomisation after stroke

1. 4.5 – 6 hours
2. >6 – 9 hours
3. Wake Up Stroke

Sample size = 310 patients

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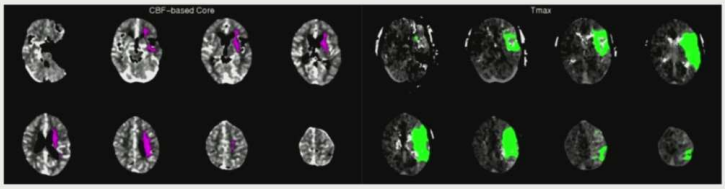
EXTEND

EXTEND

Perfusion Imaging Selection



RAPID* automated CT perfusion or MR perfusion

- **Penumbral mismatch criteria**

1.Hypoperfusion to core volume ratio	> 1.2
2.Perfusion lesion - core absolute difference	>10 ml
3.Ischaemic core lesion volume	≤70 ml

* iSchemaView

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EXTEND

EXTEND

Early Cessation of Recruitment

After the publication of the WAKE UP Study, the Steering committee sought a recommendation from the DSMB and a decision was made to cease recruitment on 6th June 2018.

In total there were **225 patients** recruited.

There were 112 patients received placebo and 113 patients received thrombolysis.

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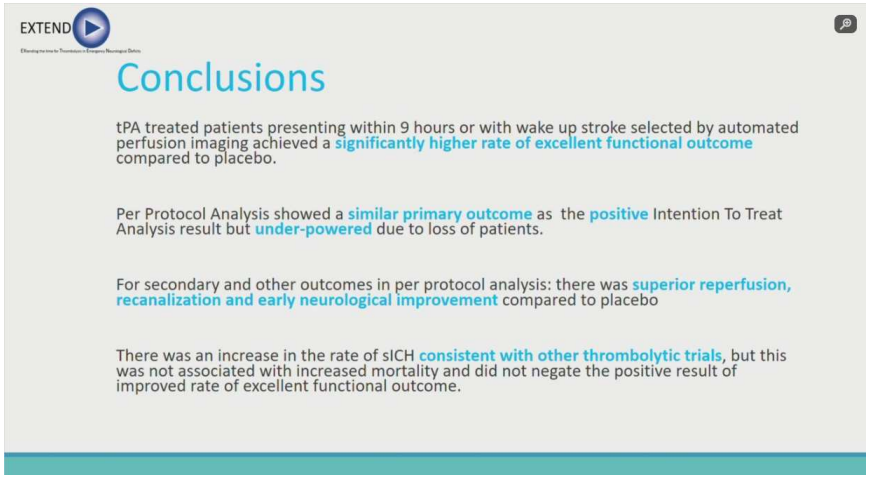

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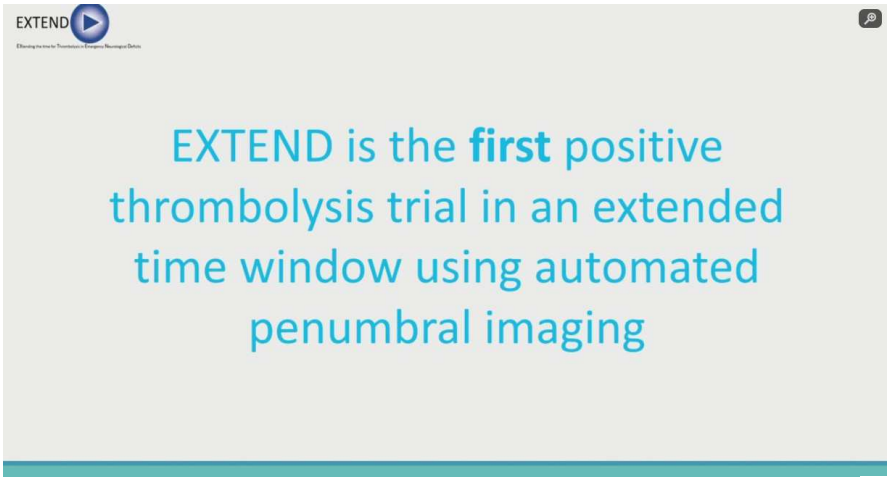

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COLLATERALS!

defuse·3

Results from the DEFUSE 3 Trial:
Good Leptomeningeal Collaterals Are Associated with Reduced Core Infarct Size but Not Improved Neurologic Outcome

Adam de Havenon, Michael Mlynash, May A. Kim-Tenser, Maarten Lansberg, Thalabe Leslie-Mazwi, Soren Christensen, Ryan McTaggart, Matthew Alexander, Greg Albers, Joseph Broderick, Michael Marks, Jeremy J. Heit

On behalf of the DEFUSE 3 Investigators

29

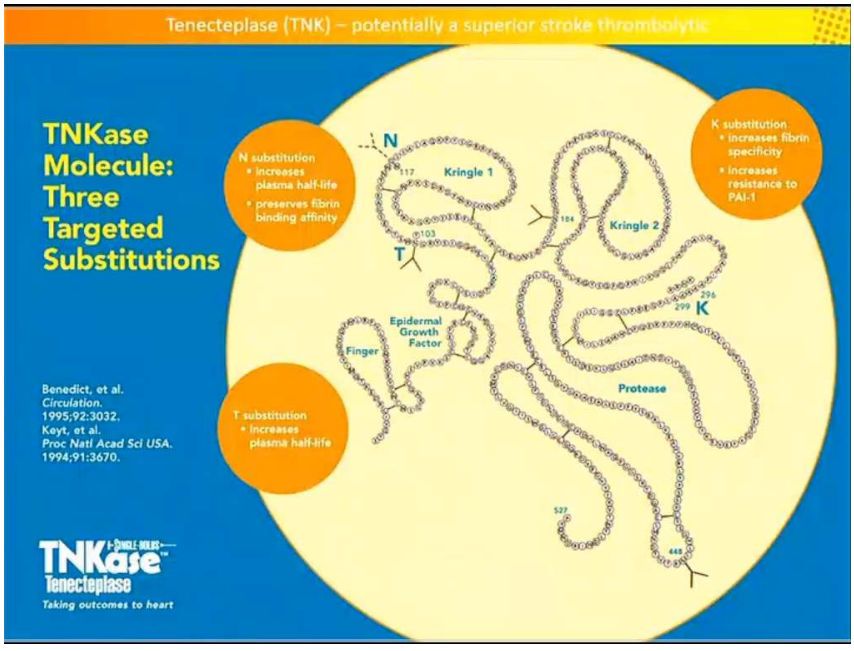
defuse·3

Conclusions

- Good collaterals:
  - Smaller baseline core volume, reduced core growth
  - Not associated with neurologic outcome, success of EVT, hemorrhagic complications, or death
- No association between collaterals and many traditional demographic predictors of baseline collateral status
- These unexpected findings require further study

29

TENECTEPLASE



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TENECTEPLASE

Summary – TNK for stroke

We know

-Easier to deliver - "drip and ship".

-Less risk of major brain haemorrhage.

-Prior to thrombectomy, superior to alteplase

-In other lysis eligible patients at least non-inferior to alteplase

Current state of play

-In Australia 2 states have replaced alteplase with TNK for pre-thrombectomy lysis

-In India generic TNK is licensed for stroke treatment

-There are at least two generic TNK being trialled in China for stroke

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SHINE

The SHINE Trial

Intensive versus Standard Treatment of Hyperglycemia in Acute Ischemic Stroke

Karen Johnston, Askiel Bruno, Qi Pauls, Christiana Hall, Kevin Barrett, William Barsan, Amy Fansler, Katrina Van de Bruinhorst, Scott Janis, Valerie Durkalski-Mauldin, for the NETT and SHINE Investigators

Neurological Emergencies Treatment Trials

NIH National Institute of Neurological Disorders and Stroke

SHINE

Stroke Hyperglycemia Insulin Network Effort

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Hypotheses

SHINE

Efficacy

- Intensive glucose control to target range of 80-130 mg/dL with IV insulin infusion in hyperglycemic acute ischemic stroke patients within 12 hours of symptom onset will improve favorable outcome by absolute 7% as measured by mRS at 90 days after stroke.

Safety

- Intensive glucose control will be safe as measured by <4% increase in severe hypoglycemia (<40 mg/dL) compared to standard control in acute ischemic stroke patients treated up to 72 hours

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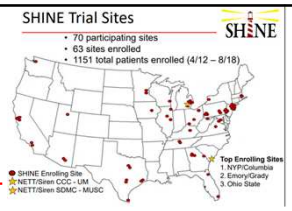
Design



- Prospective, multicenter, randomized, blinded
  - 70 US sites, maximum of 1400 patients
- Randomization balance for NIHSS & tPA
- Single blind treatment
- Double blind outcome assessment
- Treatment (up to 72 hours)
  - Intensive: Insulin drip – target 80-130 mg/dL
  - Standard: SQ insulin q6 hr – target <180 mg/dL
- 4 planned interim analyses (500, 700, 900, 1100)

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SHINE

Conclusions

- Successful & efficient completion of SHINE Trial
- Answered question of best glucose control for hyperglycemic AIS
- Intensive glucose control (80-130 mg/dL) does not improve 90 day functional outcome and increases risk of severe hypoglycemia
- SQ insulin with target <180 mg/dL is preferred

Neurological Emergencies Treatment Trials

NIH National Institute of Neurological Disorders and Stroke

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BACK TO BASICS: ADHERENCE WITH GUIDELINES FOR GLUCOSE AND TEMPERATURE CONTROL IN AN AMERICAN COMPREHENSIVE STROKE CENTER SAMPLE

OBSERVATIONAL STUDY AT 5 CSCS

235 ACUTE STROKE PTS (87% AIS, 13% ICH)

1669 CONSECUTIVE GLUCOSE MEASUREMENTS

3782 CONSECUTIVE TEMPERATURE MEASUREMENTS

POOR GLUCOSE CONTROL IN 33% OF PATIENTS (DEFINED AS > 180 MG/DL). MOST FREQUENT METHOD OF CONTROL WAS REGULAR INSULIN SLIDING SCALE WITHOUT BASAL DOSING

POOR TEMPERATURE CONTROL IN 10 % (DEFINED AS >38 DEGREES C) AND **39% DID NOT HAVE TEMPERATURE RECORDED IN THE ED**

LOWER NIHSS AND WELL-CONTROLLED GLUCOSE WERE INDEPENDENT PREDICTORS OF FAVORABLE OUTCOME (MODIFIED RANKIN SCALE SCORE 0–2) IN REPERFUSION PATIENTS

Journal of Neuroscience Nursing: June 2018 - Volume 50 - Issue 3 - p 131–137
doi: 10.1097/JNN.0000000000000358

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BACK TO BASICS

"GLUCOSE AND TEMPERATURE CONTROL MAY BE OVERLOOKED IN THIS ERA OF RAPID STROKE DIAGNOSIS AND TREATMENT. ACUTE STROKE NURSES ARE WELL POSITIONED TO ASSUME LEADERSHIP OF GLUCOSE AND TEMPERATURE MONITORING AND TREATMENT".

ANNE ALEXANDROV PHD, RN,-BC CCRN, ANVP NVRN-BC, FAAN

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TELEREHABILITATION IN THE HOME VS THERAPY IN CLINIC FOR PATIENTS WITH STROKE

Unmet need: delivery of large doses of rehab therapy

Motor deficits are a major contributor to post-stroke disability.

Animal studies with favorable plasticity use high rehab doses.
(600 repetitions of pellet retrieval/day, Nudo 1996)

In humans, higher rehab therapy doses may improve outcomes.

Steven C Cramer MD ISC 2019 Presentation and ISC Abstract LB23: Cramer SC, Dodakian L, Le V, et al, for the NIH StrokeNet Telerehab Investigators. Telerehabilitation in the home versus therapy in-clinic for patients with stroke.

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TELEREHABILITATION

Unmet need: delivery of large doses of rehab therapy

Motor deficits are a major contributor to post-stroke disability.

Animal studies with favorable plasticity use high rehab doses.
(600 repetitions of pellet retrieval/day, Nudo 1996)

In humans, higher rehab therapy doses may improve outcomes.

Quantity of rehab therapy often low in humans, however:
(1) financial constraints
(2) patient can't travel to a rehab therapy provider
(3) shortage of rehabilitation care in some regions
(4) poor patient compliance with assignments
(5) limited dose during stroke rehabilitation
(mean of 32 arm repetitions/session, Lang 2009)

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TELEREHABILITATION

Telerehabilitation in the Home Versus Therapy In-Clinic for Patients With Stroke

124 subjects with stroke 4-36 weeks prior and arm motor deficits

Randomized at 11 US sites to intensive arm motor therapy
(a) traditional In-Clinic, versus
(b) in-home Telerehabilitation

Treatment
36 sessions (18 superv'd, 18 unsuperv'd), 70 min, over 6-8 wk
Intensity, duration, and frequency of therapy matched

Assessor-blind, randomized, non-inferiority design

clinicaltrials.gov NCT02360488

Telerehab Trial

NIH StrokeNet PREVENTION | TREATMENT | RECOVERY

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TELEREHABILITATION

Primary outcome measure: change in arm motor Fugl-Meyer score from baseline to 30 days post-therapy
Intent To Treat (all randomized subjects), multiple imputation for missing data

Secondary outcome measures:
[1] Gains in stroke knowledge
[2] Change in motivation over time

Analysis: If the non-inferiority margin (30% of ΔFM for In-Clinic group) falls outside the 95% CI for the difference in ΔFM between groups, then telerehabilitation would be considered non-inferior.

Sample size: Assumed In-Clinic group mean ΔFM of 6.85 points and SD=3.8, study needed 124 subjects for 85% power.

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TELEREHABILITATION

In-Clinic Group
- **18 supervised treatment sessions** (70 minutes)
  --At the research center, with a therapist
- **18 unsupervised treatment sessions** (70 minutes)
  --In the home, using an individualized booklet

Telerehabilitation
- Study team delivered a telerehabilitation system to the home
- **18 supervised treatment sessions** (70 minutes)
  --In the home, 30 min therapist videoconference at start
- **18 unsupervised treatment sessions** (70 minutes)
  --In the home, using telerehab system (no therapist contact)

Games could be adjusted in relation to motor control, e.g., movement speed, timing, planning, range of motion, target size, cognitive demand, hemifield bias, bimanual, sustained, proximal vs. distal, and 1st person vs. 3rd person perspective

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TELEREHABILITATION

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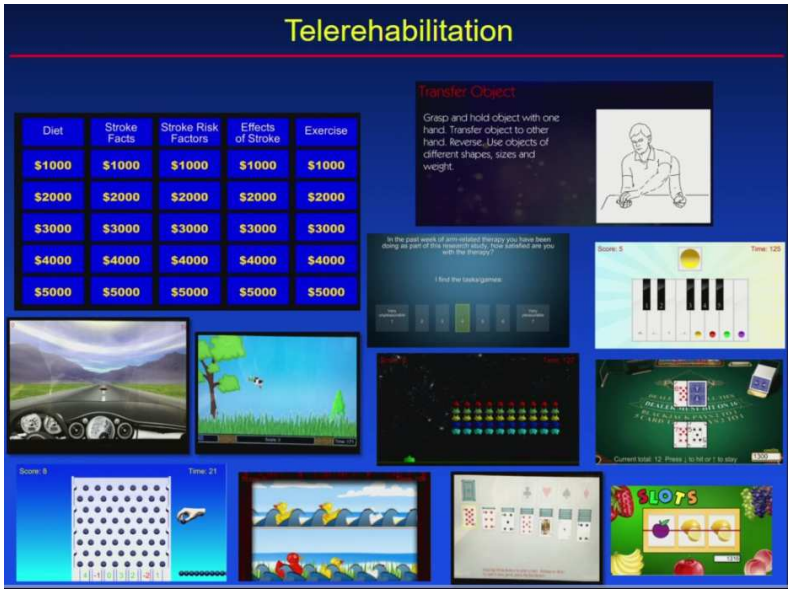
TELEREHABILITATION



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TELEREHABILITATION

Conclusions

Arms improved, as Fugl-Meyer score gains (7.86-8.36 points) exceed minimal clinically important difference (4.25-7.25).

These arm motor gains were comparable for home-based telerehab as compared to in-clinic therapy.

Telerehab was also comparably efficacious at patient education.

In future studies, telerehabilitation might be
- --paired with a drug (experience-dependent plasticity)
- --used to obtain detailed remote measurements
- --used to treat other neurological domains (language, leg, etc.)
- --studied to improve access and lower cost of post-stroke rehab

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AHA/ASA CVSN STROKE ARTICLE OF THE YEAR

Gerontologist. 2017 Oct; 57(5): 880–889. PMCID: PMC5881730
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Improving Stroke Caregiver Readiness for Transition From Inpatient Rehabilitation to Home

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46

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46

INADEQUATE CARE GIVER PREPARATION CREATES A SECOND CRISIS FOR SURVIVORS AND THEIR FAMILY CAREGIVERS AS THEY TRANSITION HOME

THIS GROUNDED THEORY STUDY ANALYZED 81 INTERVIEWS FROM 40 CAREGIVERS CARING FOR 33 STROKE PATIENTS DURING INPATIENT REHABILITATION AND UP TO 6 MONTHS AFTER DISCHARGE

CAREGIVERS DESCRIBED CRITICAL AREAS WHERE THEY FELT UNPREPARED TO ASSUME THE CAREGIVER ROLE

THESE EXPERIENCES ILLUSTRATED THE GAP IN ASSESSING AND ADDRESSING CAREGIVER READINESS TO MEET THE CARE NEEDS OF THE STROKE SURVIVOR AS THEY TRANSITIONED HOME, RESULTING IN ISSUES POST-DISCHARGE

LUTZ AND COLLEAGUES RECOMMEND A 3 STEP PROCESS TO IMPROVE PREPARATION FOR DISCHARGE

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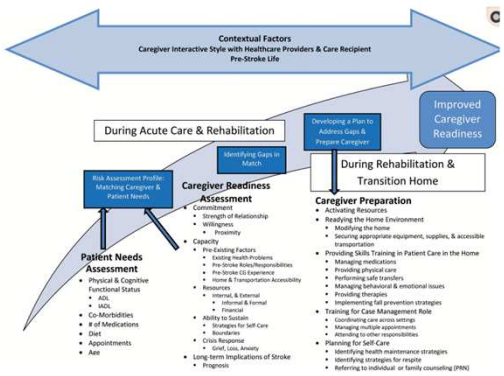
3 STEP PROCESS FOR ASSESSING AND PREPARING THE FAMILY CAREGIVER FOR ASSUMING THE CARE GIVING ROLE

Figure 1.



CONDUCTING A SYSTEMATIC RISK ASSESSMENT OF THE DYAD, WHICH INCLUDES ASSESSING THE PATIENT'S NEEDS AND THE CAREGIVER'S COMMITMENT AND CAPACITY TO ADDRESS THOSE NEEDS

IDENTIFYING AND PRIORITIZING GAPS BETWEEN THE CARE RECIPIENT'S NEEDS AND CAREGIVER'S READINESS

DEVELOPING A PLAN TO ADDRESS THE GAPS

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"IN ORDER TO MINIMIZE CAREGIVER BURDEN AND IMPROVE OUTCOMES FOR STROKE PATIENTS AND THEIR FAMILY CAREGIVERS, WE MUST CONSIDER THE FAMILY UNIT AND INDIVIDUALIZE CARE PLANS TO ADDRESS THEIR SPECIFIC NEEDS. THE CRITICAL FIRST STEPS IN THIS PROCESS ARE TO CONDUCT A COMPREHENSIVE ASSESSMENT OF THE PATIENT'S NEEDS AND, EQUALLY IMPORTANT, THE CAREGIVER'S READINESS TO ASSUME THE CAREGIVING ROLE. THIS WILL ALLOW US TO IDENTIFY GAPS AND PRIORITIZE INTERVENTIONS THAT ARE APPROPRIATELY TAILORED TO THE NEEDS OF THE FAMILY TO ENSURE APPROPRIATE FAMILY-CENTERED CARE"

Barbara Lutz

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49

49

NEW TECHNOLOGIES!

AlphaStroke

-EEG (electroencephalography) based technology

-"Place a few electrodes on easily accessible places on the head"

-About 1 minute of testing

-Binary decision: stroke or no stroke

-Identifies asymmetry in EEG signals between the two sides of the brain

-Handheld (about the size of a smart phone)

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50

50

NEW TECHNOLOGIES

BrainPulse

-Developed by Jan Medical Inc., Mountain View, CA

-Multiple indications: stroke, concussion, vasospasm, AVM, aneurysm

-Technology utilizes accelerometers

- About 4 minutes from start to result

Images courtesy of Jan Medical, Inc.

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51

51

NEW TECHNOLOGIES

BrainPulse

Accelerometer Technology:

-Surge of blood enters the brain with each heartbeat

-This blood flow is not symmetric

-Right ICA closer to left ventricle than left ICA

-Brain in "oscillations" with each heartbeat

-Accelerometers detect these oscillations

-Machine learning

-Patterns recognized, algorithms developed for specific brain pathologies

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52

NEW TECHNOLOGIES

A non-invasive wireless neurological device

"Rapid assessment may lead to early intervention, better outcomes, and reduced hospital costs."

Cerebrotech Visor™

Focus on triage of stroke patients

www.cerebrotechmedical.com

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53

53

NEW TECHNOLOGIES

Infrascanner

Left and right frontal, temporal, parietal, and occipital areas

Absorbance of light at selected wavelengths is recorded

www.infrascanner.com

Reported applications: EDs, ICUs, Pre-hospital, Military, Field Hospitals, Sports Medicine, Remote Locations

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54

54

NEW TECHNOLOGIES

Lucid and NeuralBot

Products developed by Neural Analytics, Inc., Los Angeles, CA

Devices utilize ***transcranial doppler*** (ultrasound) technology

- The Lucid™ Robotic System (Lucid™ M1 Transcranial Doppler Ultrasound System® and NeuralBot™ System)

-Integration of ***ultrasound***, ***robotics***, and ***machine learning***

-Combining transcranial doppler with a headset containing robotics

-Doppler analyzed by Lucid system, visual and numerical output

-Machine learning based on data patterns

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NEW TECHNOLOGIES

56

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NEW TECHNOLOGIES!

Sense

-Developed by Sense Diagnostics, LLC, Cincinnati, OH

-Low powered electro-magnetic pulse, radiofrequency range

-Detects changes in the signal that may indicate:

Acute hemorrhage, swelling, or seizure

Device consists of:

1) A 9 antenna array (72 data points per scan)
2) Driving electronics for the array
3) Spectrum analyzer coupled with a computer

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NEW TECHNOLOGIES!

Sense

ED, ICU, OR, prehospital

- Continuous monitoring, such as in the ICU
- Information about neurological worsening

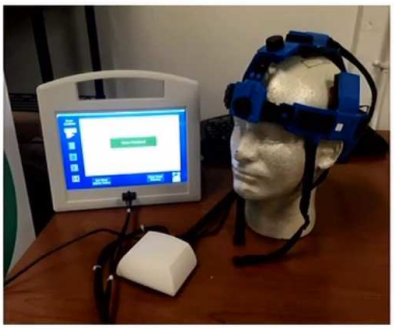

Image courtesy of Sense Diagnostics, LLC

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NEW TECHNOLOGIES!

Strokefinder

Strokefinder MD100, Medfield Diagnostics, Göteborg, Sweden

-Microwave technology

- Microwaves scatter in the matter
- Antennas surround the brain
- Mathematical processing, generation of diagram/picture

Microwave devices:

- Simpler components
- More complex signal processing

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NEW TECHNOLOGIES!

Strokefinder

Applications include:

-Prehospital screening

-Stroke

-Traumatic Brain Injury

Microwave technology potentially promising for new, cost effective imaging devices

www.medfielddiagostics.com

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NEW TECHNOLOGIES!

Artificial Intelligence in Prehospital Stroke Detection Using Computer Vision Analysis

Automation In Motion

Mark McDonald, MD
AHA/ASA International Stroke Conference
February 6, 2019

61

61

THANK YOU

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62

62