



2021 AHA Updates to Care of the Ischemic Stroke Patient: What's New

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Disclosure

I do not have any relevant relationships with a commercial interest organization.

Objective

- Review pertinent updates to care of the patient with acute ischemic stroke throughout the continuum of care.



Stroke System of Care

- Local
 - Regional
 - State
 - National
 - International
-
- Geographic
 - Access & Quality
 - Economic Stability
 - Racial / Ethnic
 - Sex / Age
 - Social & Community



Detection

An aerial view of a massive crowd of people, each wearing a different colored shirt, forming the outline of the United States. The crowd is dense and colorful, set against a white background. The text 'Targeted Community Education' is overlaid in the center of the map shape.

Targeted Community Education



High Risk Populations





Recognizing Stroke

Calling 9-1-1

American Stroke Association
A Division of the American Heart Association
Together to End Stroke®

SPOT A STROKE™
F.A.S.T.

-  **FACE** Drooping
-  **ARM** Weakness
-  **SPEECH** Difficulty
-  **TIME** to Call 911

Learn more at stroke.org





EMS Education



American Heart Association®
Mission:Lifeline®
Stroke

EMS Dispatch
per regional stroke
protocol

- 3 Perform physical exam and validated prehospital stroke identification screen
- 4 Obtain POC blood glucose

Stroke Suspected?

NO

Treat and transport as indicated per patient presentation

EMERGENCY MEDICAL SERVICES ACUTE STROKE ROUTING

Perform validated stroke severity tool used to assess for potential large vessel occlusion (LVO)

LVO Suspected?

NO

- 1 Identify and transport to nearest/closest certified stroke center (ASRH, PSC, TSC, CSC)
- 2 Provide prehospital notification

NO

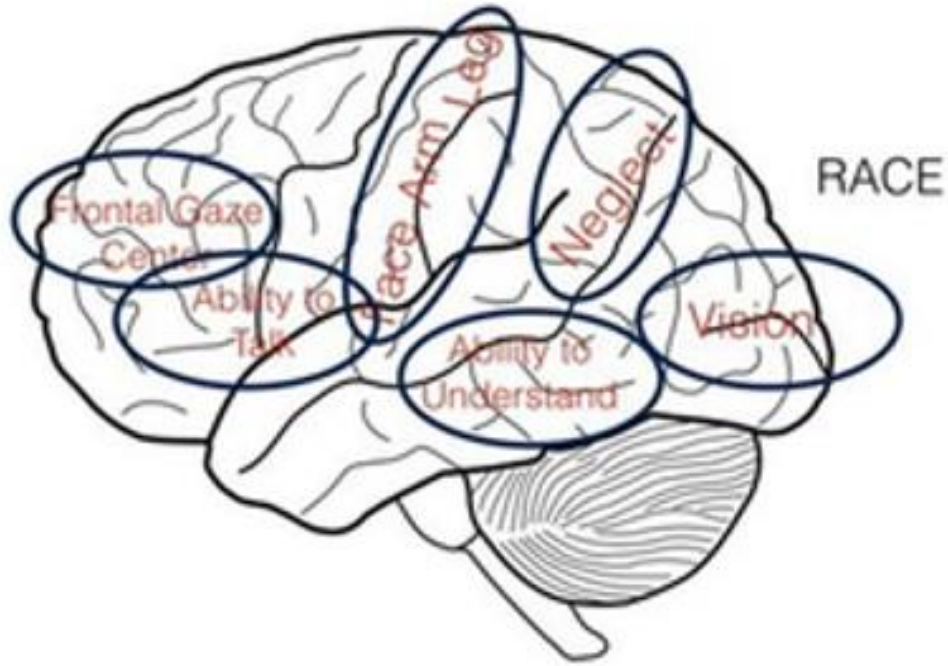
- 1 Transport to nearest

Perform validated stroke severity tool used to assess for potential large vessel occlusion (LVO)

- 1 Identify and transport to nearest/closest certified stroke center (ASRH, PSC, TSC, CSC)
- 2 Provide prehospital notification

Total transport time from scene to nearest CSC is ≤30 mins total and within maximum time permitted by EMS?

YES



Pre-Hospital LVO Scales	
RACE	0.83
G-FAST	0.80
CG-FAST	0.80
LAMS	0.79
CPSS	0.79
PASS	0.76
C-STAT	0.75
FAST-PLUS	0.72

Large Vessel Occlusion
Scales

Acceptable to Good Prediction





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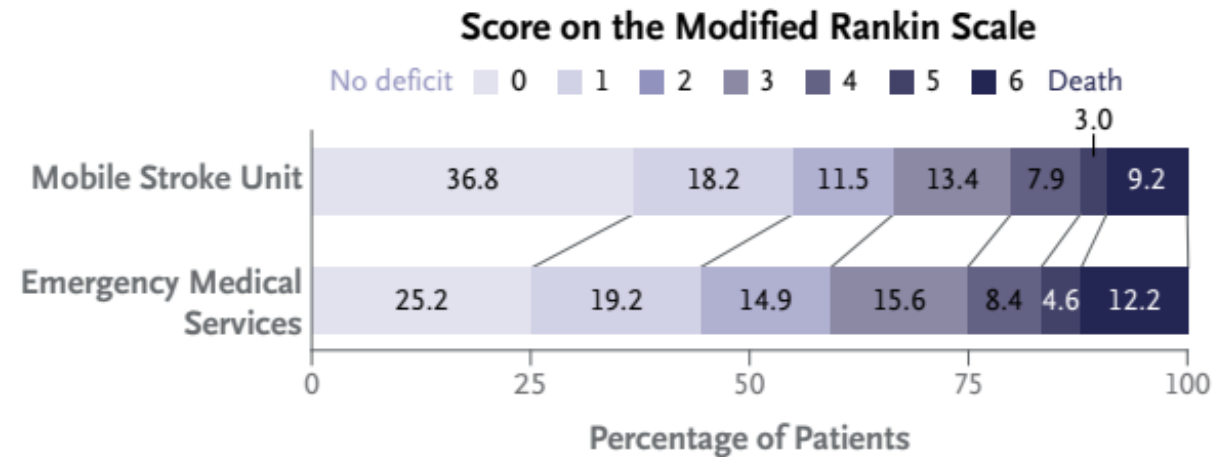
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Prospective, Multicenter, Controlled Trial of Mobile Stroke Units

J.C. Grotta, J.-M. Yamal, S.A. Parker, S.S. Rajan, N.R. Gonzales, W.J. Jones, A.W. Alexandrov, B.B. Navi, M. Nour, I. Spokoyny, J. Mackey, D. Persse, A.P. Jacob, M. Wang, N. Singh, A.V. Alexandrov, M.E. Fink, J.L. Saver, J. English, N. Barazangi, P.L. Bratina, M. Gonzalez, B.D. Schimpf, K. Ackerson, C. Sherman, M. Lerario, S. Mir, J. Im, J.Z. Willey, D. Chiu, M. Eisshofer, J. Miller, D. Ornelas, J.P. Rhudy, K.M. Brown, B.M. Villareal, M. Gausche-Hill, N. Bosson, G. Gilbert, S.Q. Collins, K. Silnes, J. Volpi, V. Misra, J. McCarthy, T. Flanagan, C.P.V. Rao, J.S. Kass, L. Griffin, N. Rangel-Gutierrez, E. Lechuga, J. Stephenson, K. Phan, Y. Sanders, E.A. Noser, and R. Bowry

Mobile Stroke Unit



**I feel the
need...the need
for speed!**





Recognizing Suspected Acute Stroke

Stroke



Stroke Alert



American
Stroke
Association.
A division of the
American Heart Association.

Wolf

Because wolves are such social animals, communication within the pack is essential.

Posturing and gestures by submissive pack members help to preserve pack cohesion, without bloodshed, and all members reaffirm their status and pack positions through displays of submission and aggression.

COMMUNICATION



Emergency Department Code Stroke Pathway

	EMS Pre-Notification	0 to 10 minutes	10 to 20 minutes	20 to 30 minutes	30 to 45 minutes	
Priorities: 	Activate Code Stroke, Register Patient & Enter Orders	Rapid Triage, Brief Exam, Non Contrast CT Scan	Advanced Imaging, Full History, NIHSS, Labs Drawn & Sent	Determine IV eligibility (Goal: Door to Alteplase ≤30 min)	Determine IA eligibility (Goal: Door to Groin Puncture ≤60 min)	Post-activation
ED MD	- Obtain Name & DOB from EMS - If last known normal (LKN) is ≤24 + ≥1 focal stroke s/s, ACTIVATE CODE STROKE. Include ETA, age, stroke s/s and LKN - Activate ED Adult Stroke Initial Evaluation Orders	- Verify Blood Glucose result obtained by EMS (if <60mg/dL don't go directly CT) - Brief Neuro Exam within 1st 10min <u>If no pre-notification received:</u> - If LKN is ≤24 + ≥1 focal stroke s/s, ACTIVATE CODE STROKE. Include ETA, age, stroke s/s and LKN - Activate ED Adult Stroke Initial Evaluation Orders	- Maintain SBP ≤185 and DBP ≤110 if reperfusion candidate - Implement Hemorrhagic Stroke orders if needed based on CT results - Manage Overall Care - Brief update to patient/caregiver - Transport to assigned room - Verify/initiate IV access (2 if possible) - Draw Labs - If patient is on warfarin obtain POC INR	- Maintain SBP ≤185 and DBP ≤110 - Manage overall care, review labs, ECG - Vital Signs: BP & HR - Strict NPO - Obtain 2nd IV for alteplase <u>If Alteplase Candidate:</u> - Notify ED MD & NEU for BP ≥185/110	- Maintain SBP ≤185 and DBP ≤110 - Manage overall care, review ECG - For Alteplase treated patients: Maintain SBP ≤180 and DBP ≤105 - Monitor for post-alteplase complications	- For Al - SBP <18 - Monit - complic
	- Obtain name & DOB from EMS - If last known normal (LKN) is ≤24 + ≥1 focal stroke s/s, ACTIVATE CODE STROKE. Include ETA, age, stroke s/s and LKN	- Rapid Triage - Obtain vitals from EMS monitor - Notify ED MD for BP ≥185/110 - Place ID band on patient - Obtain Blood Glucose (if not done by EMS) & notify ED MD of results	- Complete independent double check and warfarin - Draw up bolus into syringe - Administer bolus and infusion per order & protocol - Implement post-alteplase Neuro assessment and VS protocol:	- Begin mixing alteplase when advised by NEU MD - Complete independent double check and warfarin - Draw up bolus into syringe - Administer bolus and infusion per order & protocol - Implement post-alteplase Neuro assessment and VS protocol:	<u>If Alteplase Administered:</u> - Continue post-alteplase Neuro assessment and VS protocol - Monitor post-alteplase complications - Monitoring Bedside Dysphagia Screen: if pass may administer meds, obtain diet order; if fail STRICT NPO <u>If MT Candidate:</u> - Transport to NIR, handoff to anesthesia/NIR nurse at bedside <u>If Intra-Arterial Candidate:</u> - Complete advanced imaging, (if not done) - Send final treatment decision and transport decision updates Code MT Pagers	- Continu - assess - Hang - alteplas - Monit - Nursin - pass ma - order; if - Trans - availabl <u>If</u> - Nursin - pass ma - order; if - Trans - Writ - templat - image(s)
ED RN	- Contact ED Registration for STAT registration: if no name/DOB available register as "Unidentified" or "Disaster" patient - Notify CT scan to receive room assignment - ED RN (or pharmacist) obtains alteplase kit - Obtain monitor & place on stretcher - Obtain Stroke Resource Binder	- Transport to CT Scan on EMS stretcher <u>If no pre-notification received:</u> - Contact ED Registration for STAT registration - Obtain alteplase kit *Note: If no name/DOB available, patient should be registered as a "Unidentified" or "Disaster" Patient *Note: Registration SHOULD NOT delay CT Scan, patient may be registered after CT scan in	- Cardiac Monitoring - Strict NPO - Obtain & document patient weight - Begin Stroke Narrator Documentation - Initiate advanced imaging plan (if needed) - If advanced imaging ordered, page	- Review ECG, Lab Results (BG is only required test if not on anticoagulation and no history of blood dyscrasias) <u>If Alteplase Candidate:</u> - Verify SBP ≤185mmHG and DBP ≤110mmHG. Treat if needed		

Defining Roles and Responsibilities



Dedicated Stroke Nurse



Tele-Stroke Services

- Last Known Normal
- Historic and current vital signs
- Allergies
- Medications

Private Vehicle Walk-Ins





“A stroke may look
nothing like you
imagined it would.”



Thrombolytic Treatment

- Alteplase
- Tenecteplase



Monitoring for Patient Safety

Patient Monitoring

Signs of improvement or deterioration

Table 4. Nursing Pearls for Performing the NIHSS

Item	Pearls in performing	Score regardless	Aphasic patient	Comatose patient	Intubated patient
1a LOC responsiveness	May use painful stimuli			No response or reflexive to pain: Score=3	Assess LOC if not sedated/paralyzed
1b LOC questions		Dysarthria, language barrier, trauma: Score=1	May write answers or can be given yes/no options No comprehension: Score=2	Score=2	Score=1
1c LOC commands	May pantomime or substitute 1-step commands	Patients with trauma, amputation, etc, should be given other 1-step commands		Score=2	Assess normally
2 Best gaze	May perform oculoccephalic maneuver	Patients with isolated peripheral nerve palsy (CN III, IV, or VI): Score=1	Establish eye contact and move around the bed	Oculoccephalic maneuver	Assess normally
3 Visual		Blindness from any cause: Score=3	Blink to threat	Blink to threat	
4 Facial palsy	May use painful stimuli or pantomime	Remove physical barriers that obscure face	Pantomime to encourage the patient	Check grimace to painful stimuli	
5 Motor arm	May pantomime Palms down Test each arm separately beginning with nonparetic arm No score for amputation or fusion		Place the patient's arm in starting position and encourage using urgency in the voice to hold in position	Reflexive posturing: Score=4	
6 Motor leg	May pantomime No score for amputation or fusion		Place the patient's leg in starting position and encourage to hold in position	Reflexive posturing: Score=4	
7 Limb ataxia	Test with eyes open No score for amputation or fusion	If blind, score from extended finger position to nose If visual field defect, test in intact visual field Hemiplegia: Score=0	Passively move the limb to show what is expected If cannot understand: Score=0	Unintestable: Score=0	

CLINICAL STATEMENTS
AND GUIDELINES

Neurological Assessment of the Adult Hospitalized Patient



Direct to Endovascular Suite

- Criteria-based decision



Handoff

- NIHSS
- Current neurological assessment
- Vital signs
- Allergies
- PMHx
- Timing of thrombolytics
- Family contact
- Verification and review of:
 - History and Physical
 - Mallampati Score
 - American Society of Anesthesiologists (ASA) classification score
 - Informed Consent

Nursing Assessments

- Neurologic Assessment
- Cardiopulmonary Assessment
- NIHSS (completed with the transferring team when possible)



Neurologic Assessment

Cardinal Symptoms

Level of Arousal

Cranial Nerves

Motor Response

Sensory Response

Coordination

Document findings

Cardiovascular Assessment

Pulse Oximetry- maintain >94%

Cardiac Rhythm

Vascular Assessment

- Transradial approach
 - Assess distal circulation, capillary refill, color, temperature
- Femoral approach
 - Assess distal circulation, capillary refill, color, temperature

Notify Physician if there are abnormalities

Immediately Prior to the Procedure

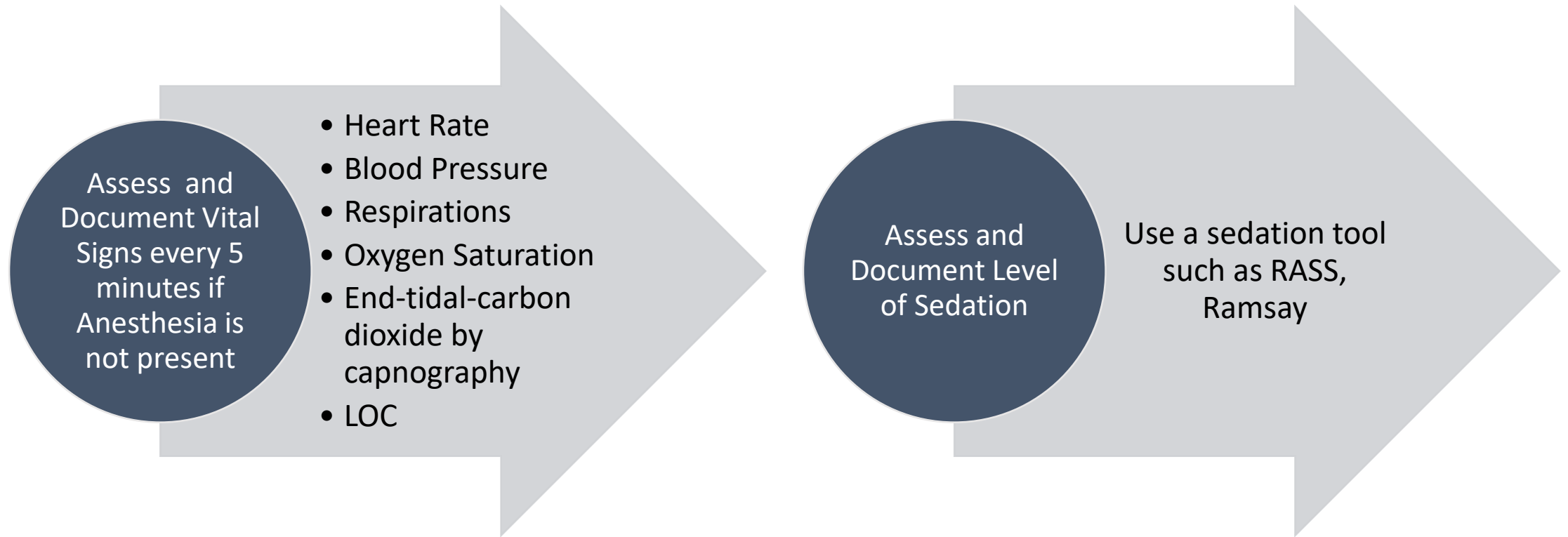


Time out /Universal Protocol



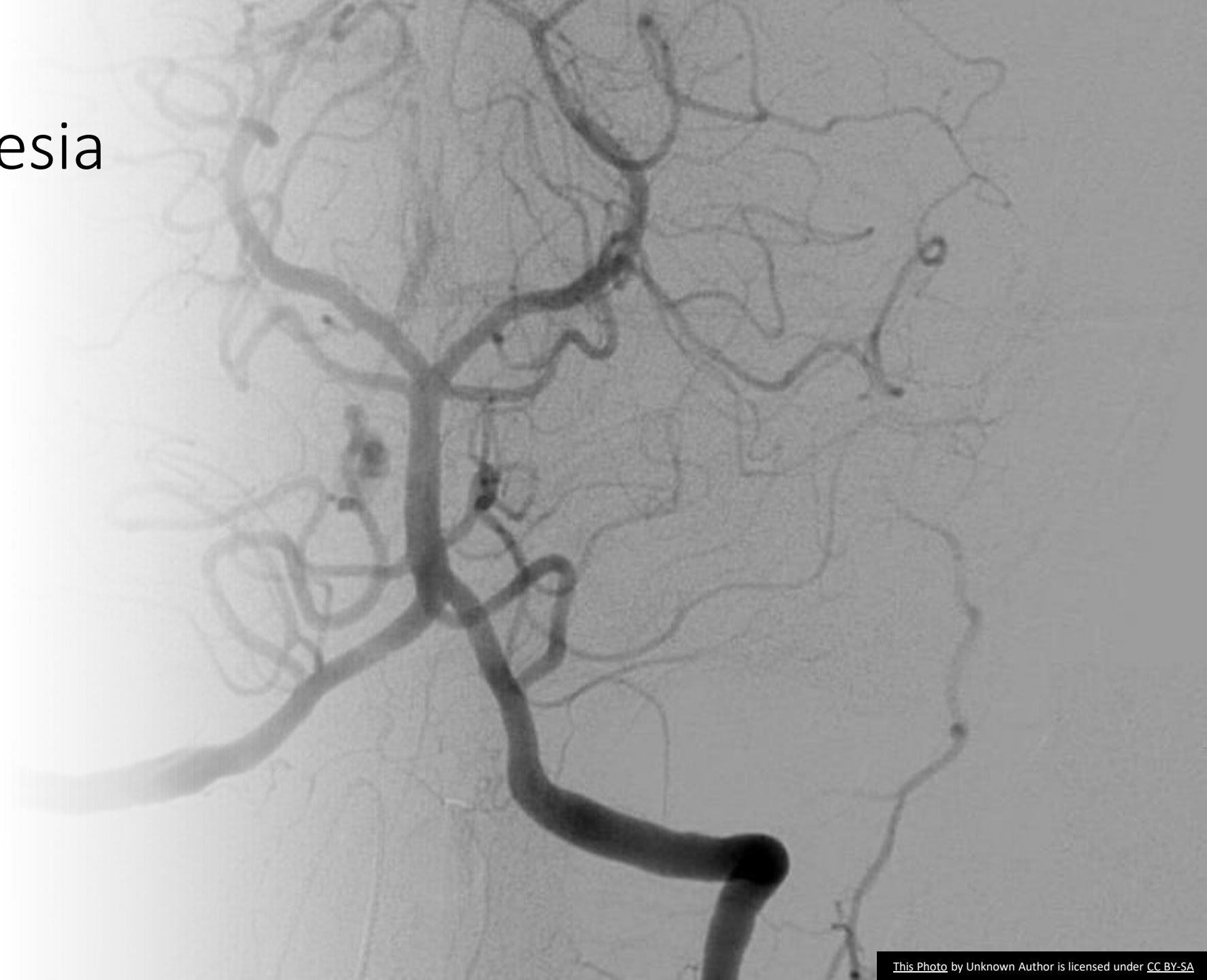
Discuss Blood Pressure Parameters
with the Proceduralist

During the Procedure



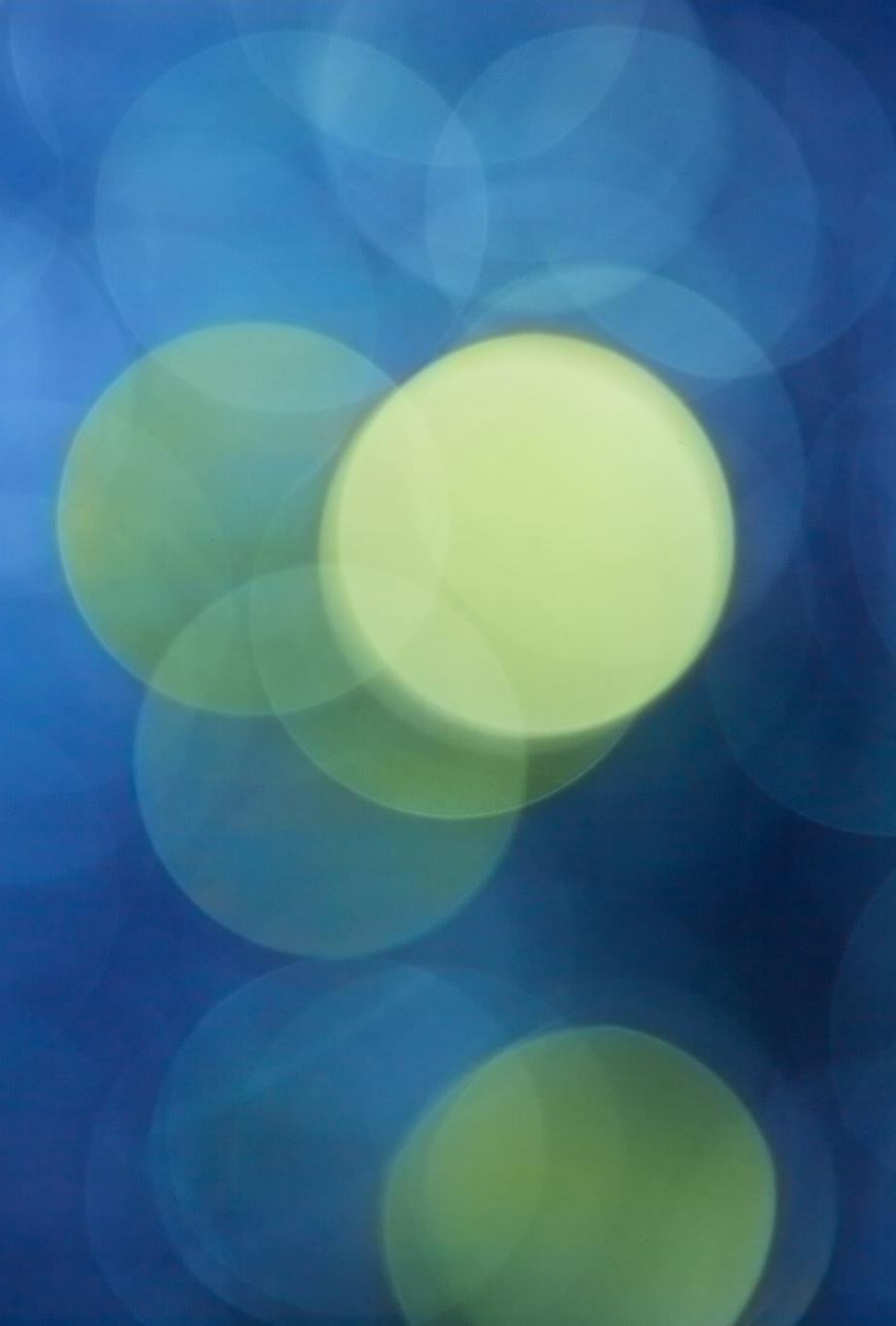
When Anesthesia is Present

- The Nurse may act as the Circulator





Complications



Mechanical Thrombectomy

VESSEL PERFORATION/DISSECTION

EXTENSION OF THE INFARCT

INCREASED CEREBRAL EDEMA

REACTIONS TO ANESTHESIA

CONTRAST MEDIA REACTION

Post Procedural Care

Post procedural monitoring begins at Sheath removal and hemostasis occurs

- Document Sheath removal time
- Monitor every 15 minutes for 1 hours, every 30 minutes for 1 hours and every hour for 4 hours

Neurological Status and Vital Signs Assessment using the same Criteria of Pre-Assessment; Compare findings

Site and Vascular Assessment

- Transradial- Follow Manufactures guidelines for release of pressure from device. Assess distal circulation
- Femoral-Assess site and distal circulation including pulses

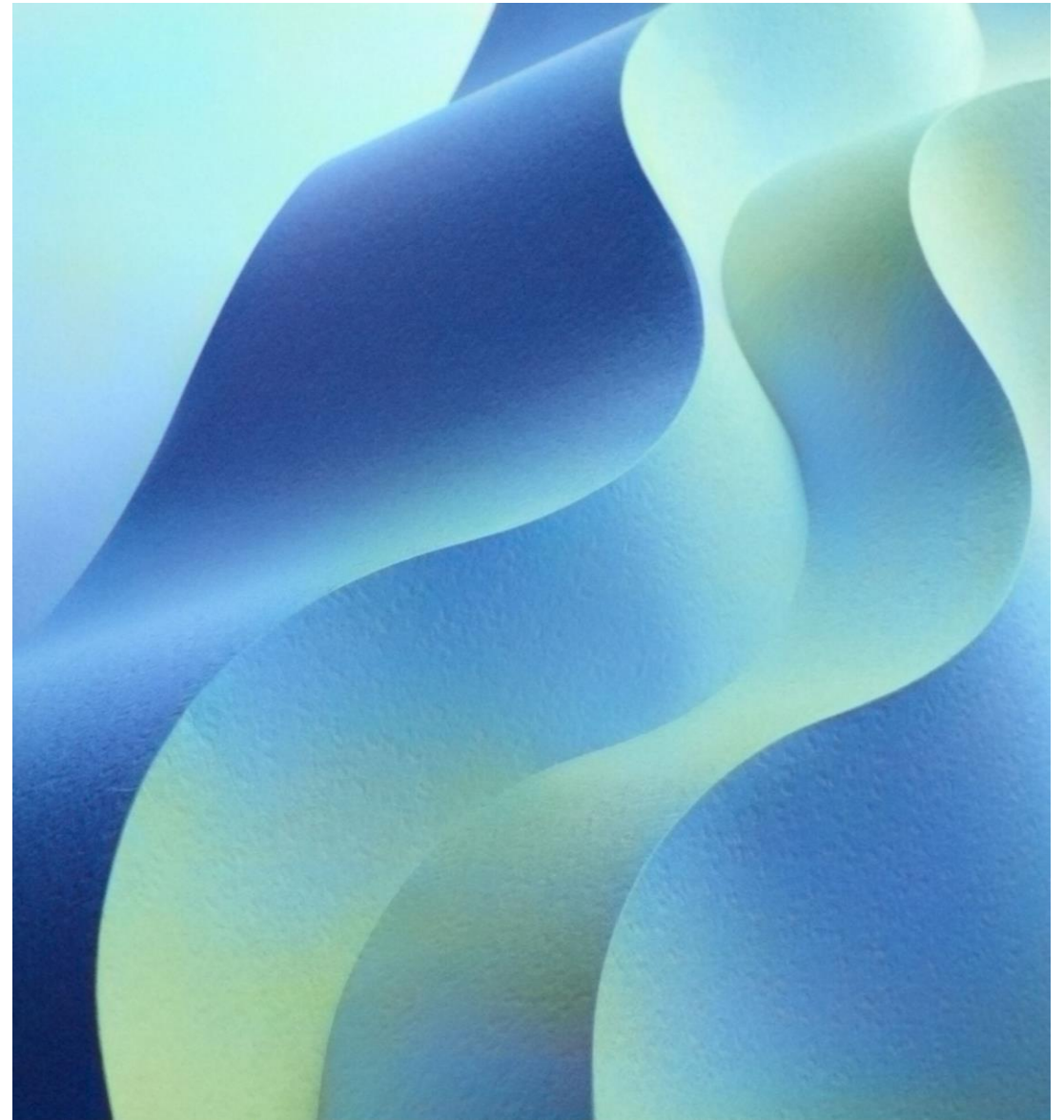
Intravenous Thrombolytics

Cerebral
Hemorrhage

Allergic
Reaction

Systemic
Hemorrhage

Angioedema



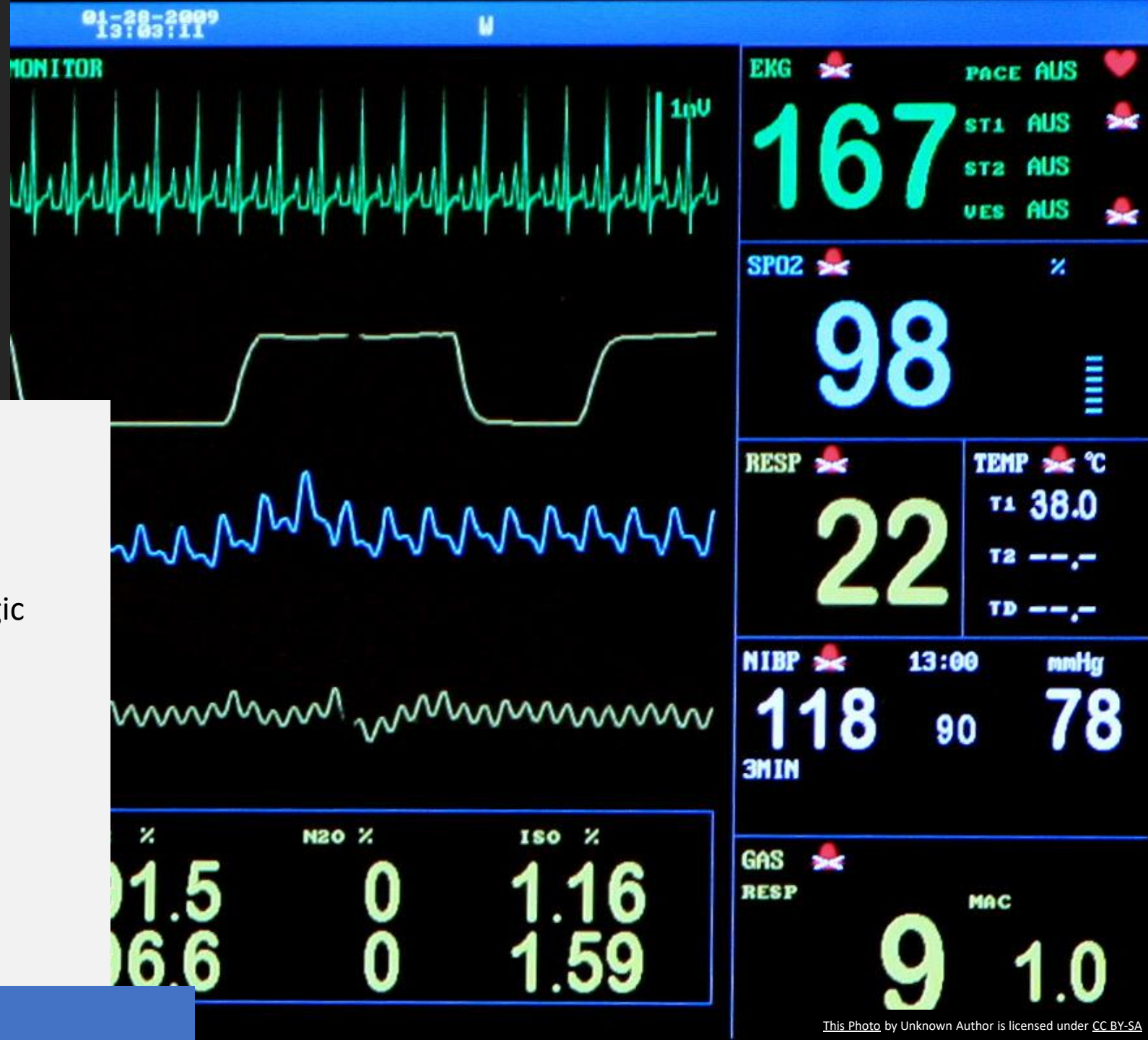


ICU Handoff

- Presenting/Cardinal Symptoms
- Area of Infarct
- NIHSS
- Time of Hemostasis if Mechanical Thrombectomy

ICU Nursing Care

- Assessment and Recognition of Patient Status
- Airway Breathing, Circulation, Neurologic
- Documentation is dependent on Interventions
 - Thrombolytic
 - Thrombolytic with Mechanical Thrombectomy
 - Mechanical Thrombectomy



Hemodynamic Monitoring

- Patient otherwise eligible for emergency reperfusion therapy except that BP is $>185/110$ mm Hg
- Management of BP during and after alteplase or emergency reperfusion therapy, maintain BP $<180/105$ mm Hg



Intensive Care Nursing

- Nothing By Mouth until Evidence Based Swallow Screen is Passed
 - Nutritional support within 72 hours
- Determine Positioning of Patient Head of Bed
- Hemodynamic Monitoring
- VTE Prophylaxis
- Neurologic Assessment
 - Level of Arousal, Cranial Nerves, Motor Responses, Presenting Symptoms
 - Consider including an NIHSS
 - Assess for Increase in Intracranial pressure

Intensive Care Nursing

Supportive Care

- Glycemic Control-
maintain glucose in the range of 140 to 180 mg/dL. In addition, nurses should avoid and immediately treat hypoglycemia (<60 mg/dL)
- Fever-
there is no good evidence to suggest that induced therapeutic hypothermia is of benefit
- Bowel and Bladder Function-
assess for urinary retention, constipation or bowel/bladder incontinence

Goals of Care

- Understanding the Patients and Families Goals of Care
- Early Intervention of Palliative Care when needed





Stroke Unit

Check List



1. Synthesis of ICU Course, Dates of Key Events

2. To-Do Action Items

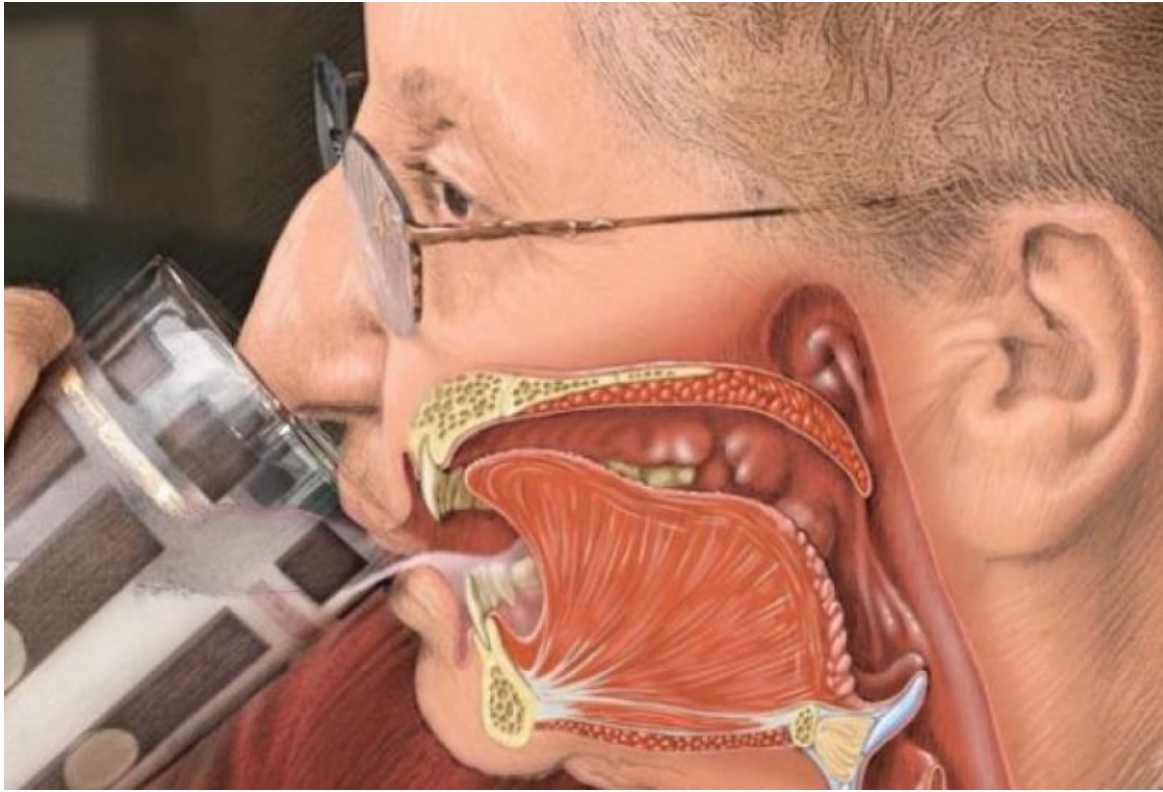
3. Systems-based Checklist

- Neurological exam fluctuations, “if, then” plans:
- Hemodynamic stability (need for PRN anti-hypertensive medication pushes, drips off, etc.):
- Cardiac arrhythmias:
- Secretions:
- Oxygen & respiratory needs:
- Volume status:
- Foley / urinary retention:
- Antibiotics (indication, duration, end date):
- DVT prophylaxis:
- Swallow function/PO status:
- Bowel movements/regimen:
- Glycemic control:
- Home medication reconciliation:
- Code status:
- Goals of care:

Key Nursing Assessments

- Vital sign monitoring
- Fever
- Hyperglycemia
- Swallow Screen
- Neurological assessments





Monitoring for Complications

- Neurological
- Dysphagia & Pneumonia
- Urinary & GI
- Psychosocial & Neuropsychological
- Mobility

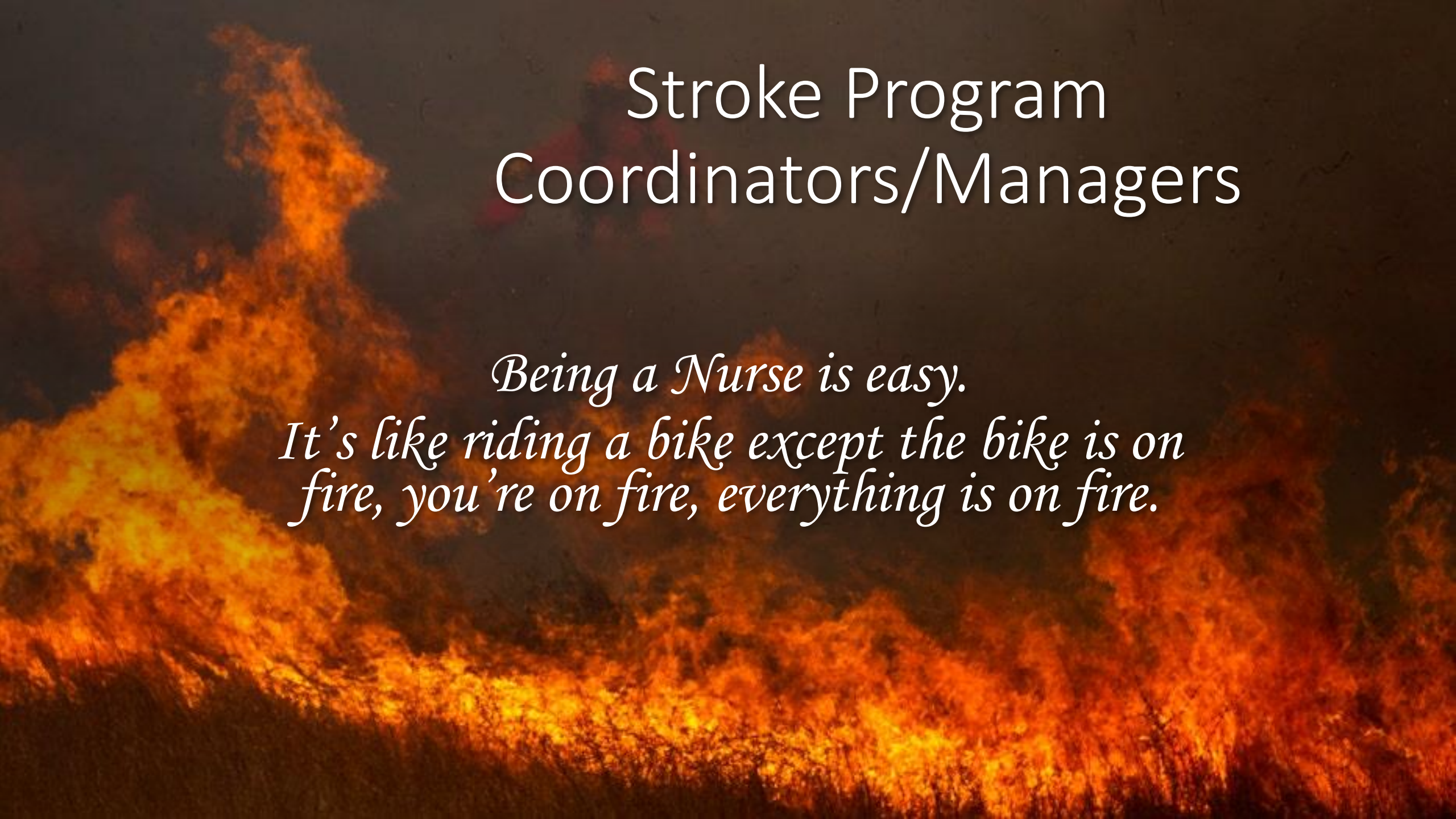


Care Transitions



Care Transitions

- Secondary stroke prevention
- Self-management
- Reducing readmissions
- Goals of care
- Innovations in transitions of care



Stroke Program Coordinators/Managers

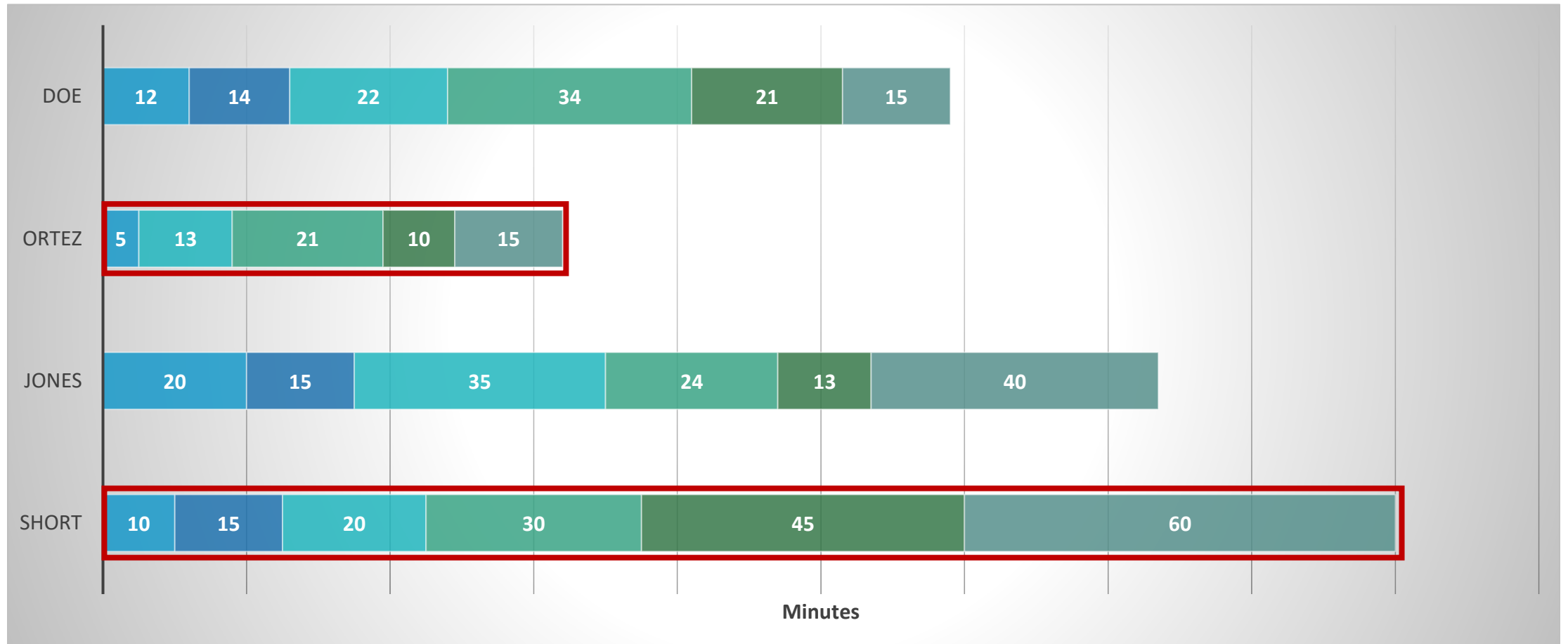
*Being a Nurse is easy.
It's like riding a bike except the bike is on
fire, you're on fire, everything is on fire.*



“You cannot improve what you
don’t measure”

Peter Drucker

Quality Improvement



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*Thank
you*



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Norma McNair, PhD, RN, FAHA; Janice L. Hinkle, PhD, RN, FAHA; Sandy Middleton, PhD, RN, FAHA; Elaine T. Miller, PhD, RN, FAHA; Stacy Perrin, PhD, RN; Martha Power, MSN, APRN, FAHA; Andrew M. Southerland, MD, MSc, FAHA; Deborah Summers, MSN, RN, FAHA on behalf of the Stroke Nursing Science Sub-Committee of the Council on Cardiovascular and Stroke Nursing and the Stroke Council

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