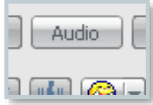


Adapt Your Stroke Imaging Program For Success in the New DAWN Paradigm



- Webinar begins at 2:00 p.m. Central Time (no sound until then)
- Trouble connecting to audio? Click the audio button for options: 
- Question? Please send a chat to the host.
- Today's presentation is informational only - no credit available.

Presenters:

Benjamin W. Strong, MD | Chief Medical Officer, vRad

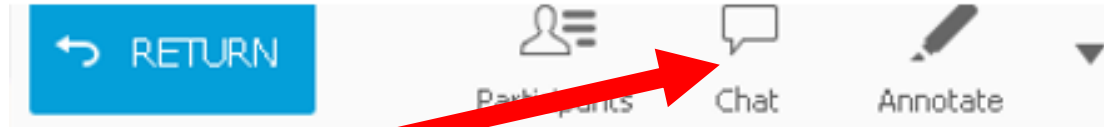
J.P. Dym, MD | Director of Stroke Imaging, vRad



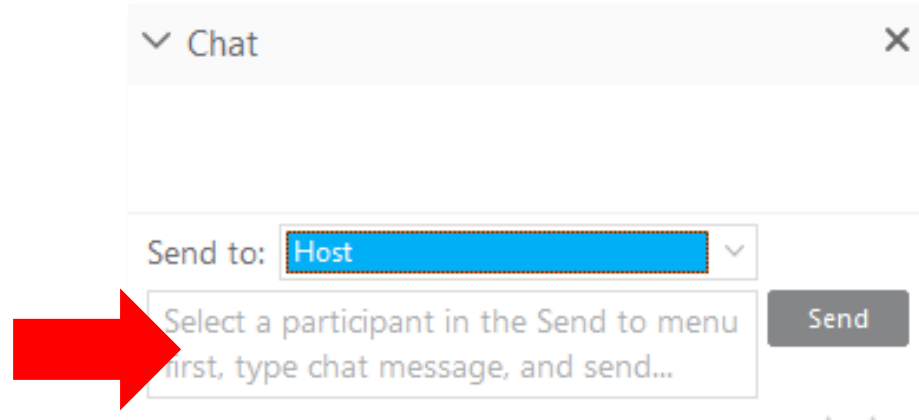
Q&A

Use “Chat” to ask questions during the Webinar:

Access the chat panel in the floating menu at the top of your screen.



Ask questions in this space in the Chat.



Today's Presenters



Benjamin W. Strong, MD
Chief Medical Officer, vRad

Education and Certification

- Medical degree: The University of Arizona College of Medicine, Tucson
- Radiology residency: University of Arizona, Arizona Health Sciences Center
- Fellowship in Musculoskeletal MRI: University of Arizona, Arizona Health Sciences Center
- American Board of Radiology



J.P. Dym, MD
Director of Stroke Imaging, vRad

Education and Certification

- Medical degree: Georgetown University School of Medicine
- Radiology residency: Lenox Hill Hospital
- Fellowship in Neuroradiology: Yale University School of Medicine
- CAQ in Neuroradiology
- American Board of Radiology

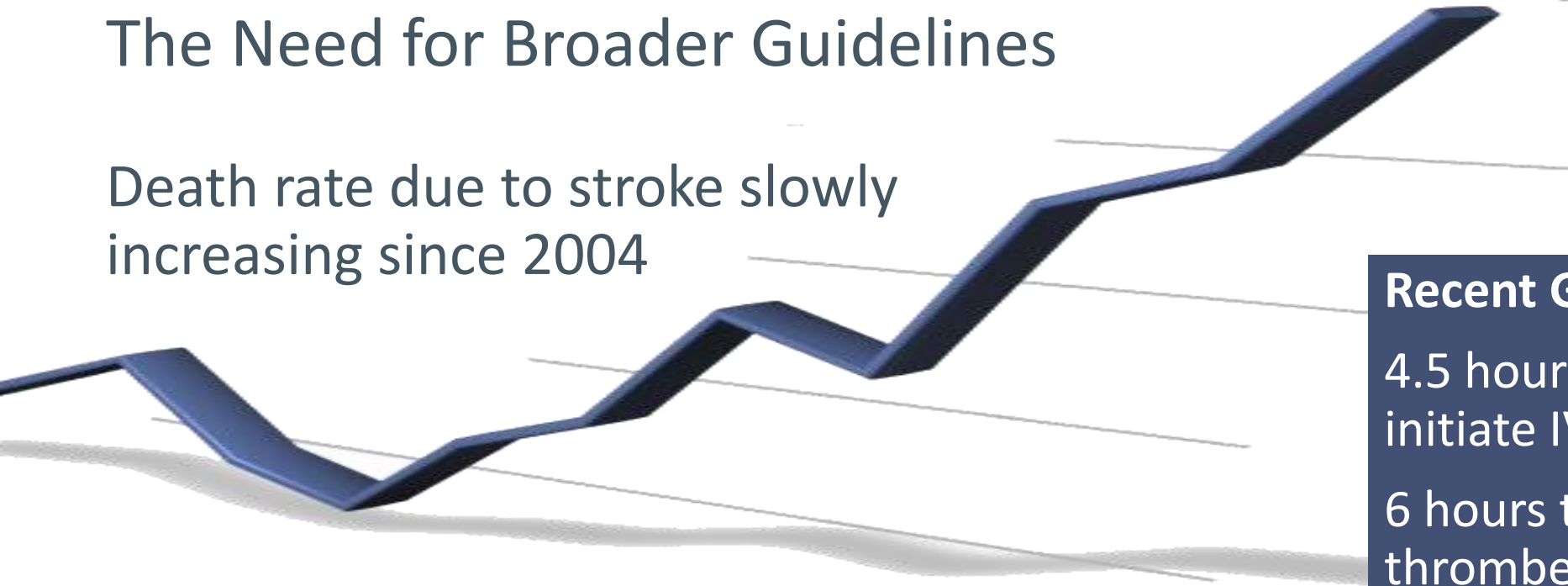
Our Agenda

- Background – The DAWN Era
- Implications for Imaging Providers
- Strategies for Success in the New Paradigm
- Q&A

Background – The DAWN Era

The Need for Broader Guidelines

Death rate due to stroke slowly increasing since 2004



Recent Guidelines

4.5 hours from first signs to initiate IV tPA

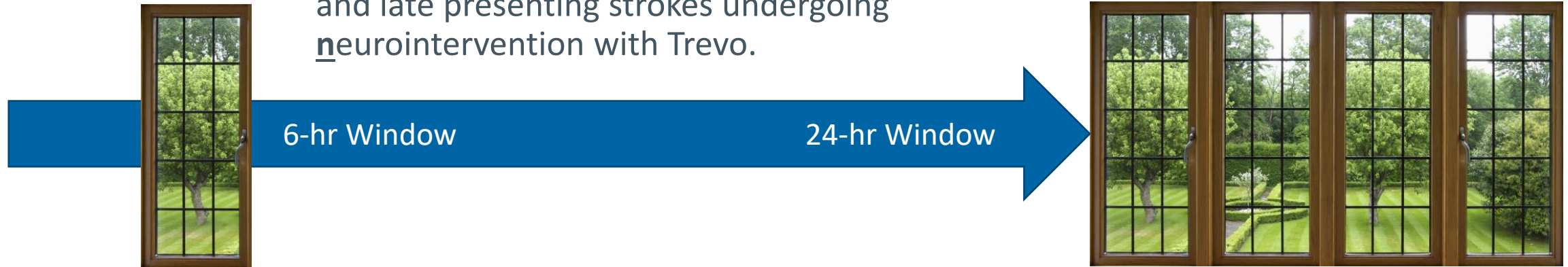
6 hours to initiate mechanical thrombectomy



But, wait...what about the 200,000 victims who wake up with stroke?

Landmark Changes in Stroke Care

DAWN Trial Diffusion weighted imaging or computerized tomography perfusion assessment with clinical mismatch in the triage of wake up and late presenting strokes undergoing neurointervention with Trevo.



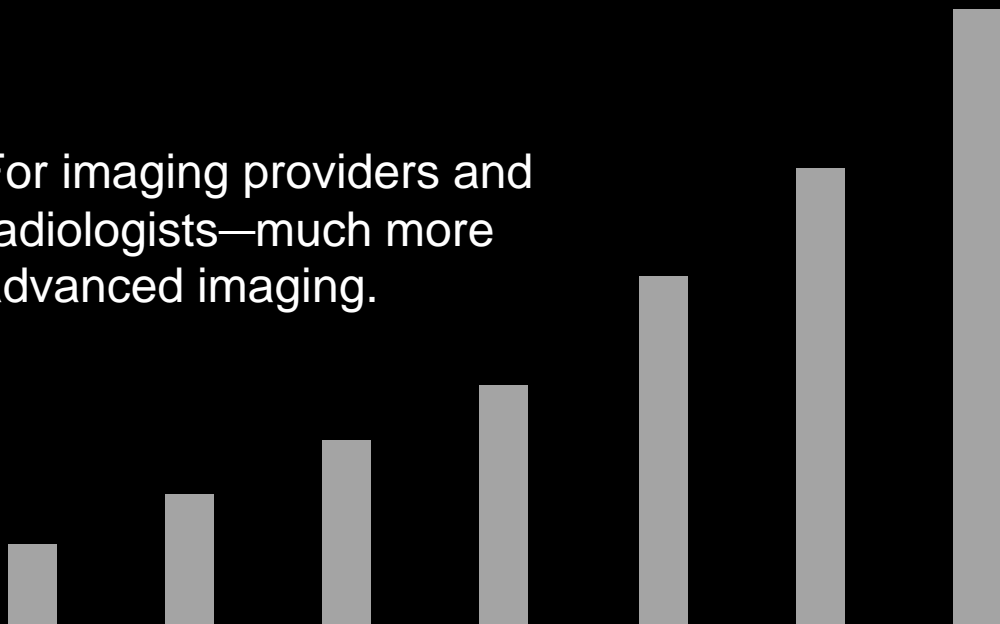
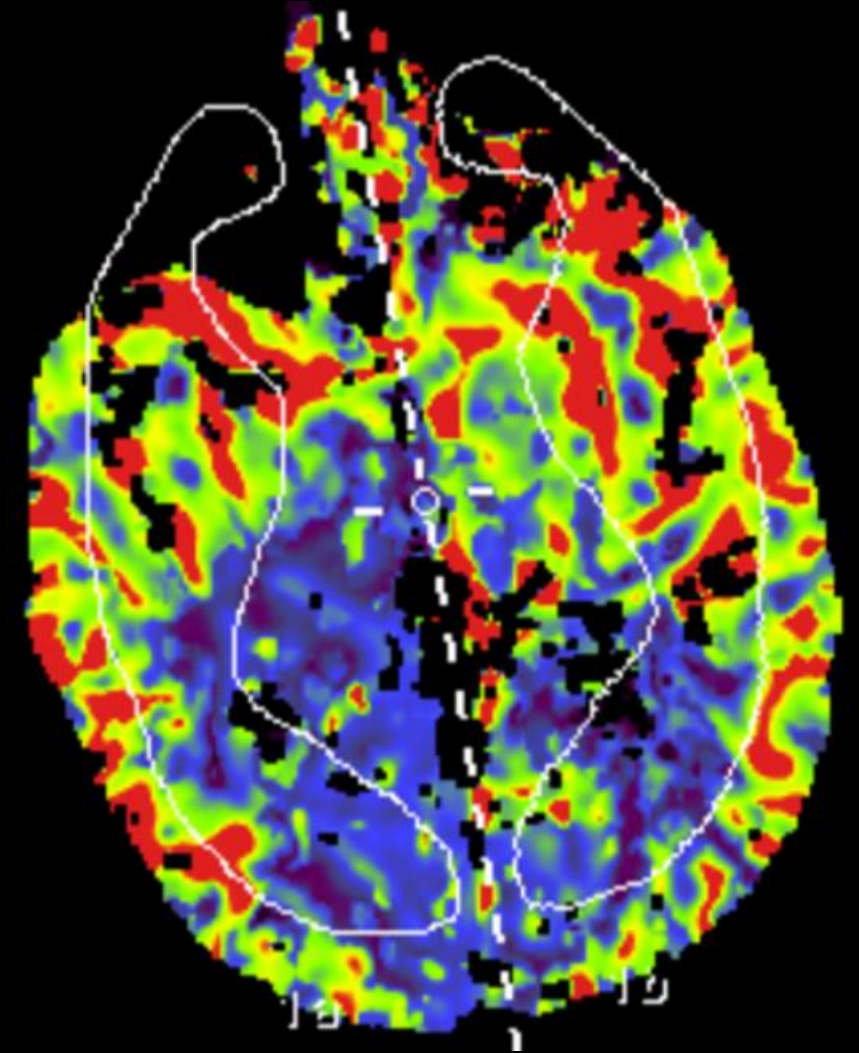
Implications for Imaging Providers

Finally – Care Options for WUS

Wake-up strokes, strokes with unclear onset time, and witnessed late presenting strokes may potentially benefit from intra-arterial reperfusion therapy.

25% of strokes are classified as wake-up or daytime-unobserved strokes. That's roughly 200,000 of 800,000 U.S. stroke victims annually!

For imaging providers and radiologists—much more advanced imaging.



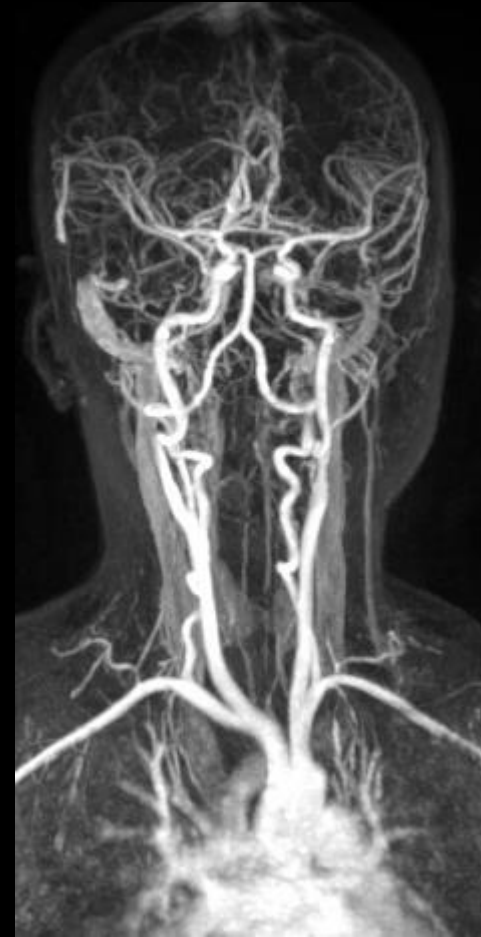
Other Advanced Imaging



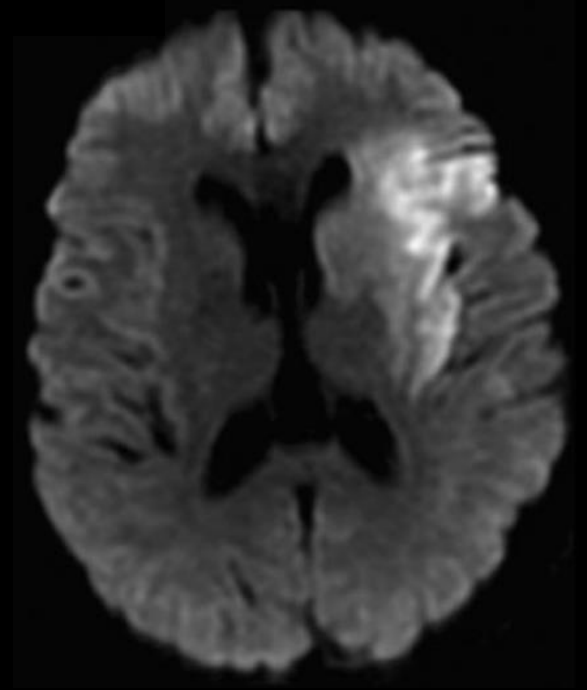
CT Angiography (CTA)
Head



CTA Neck

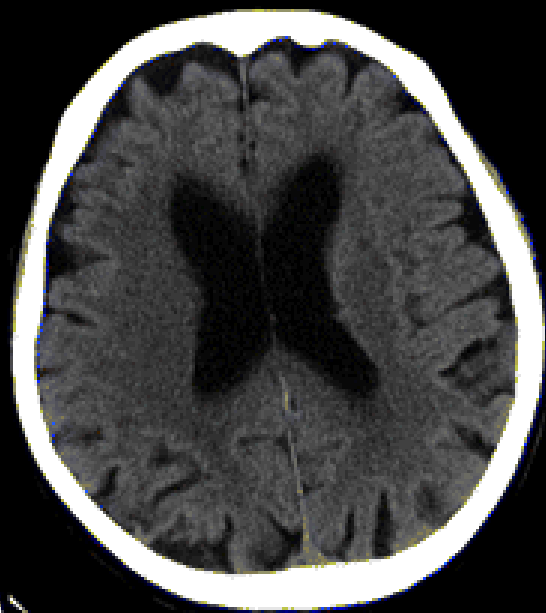


Magnetic Resonance
Angiography (MRA)



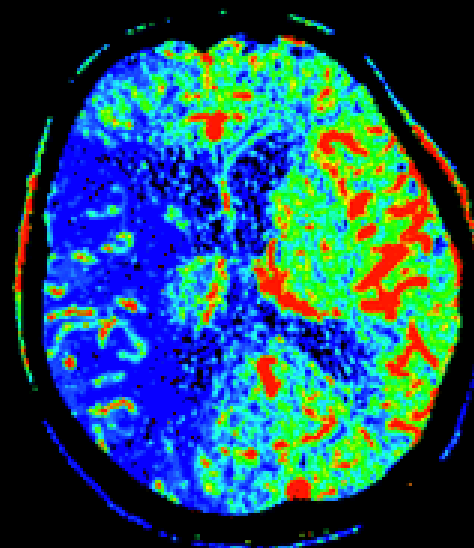
Diffusion-weighted
Imaging (DWI)

Non-contrast
Head CT



100.00

0

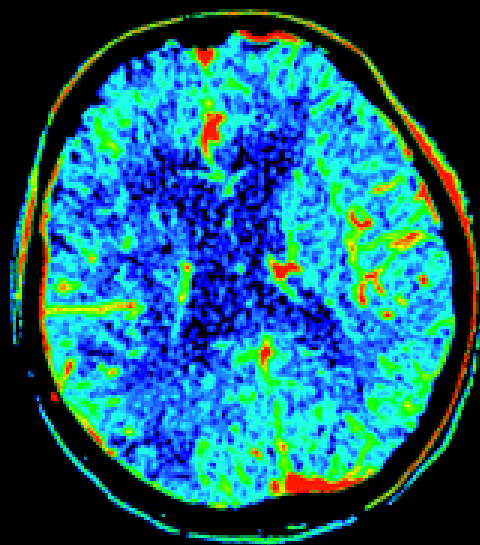


Mean
Transit
Time

Cerebral
Blood
Volume

10.000

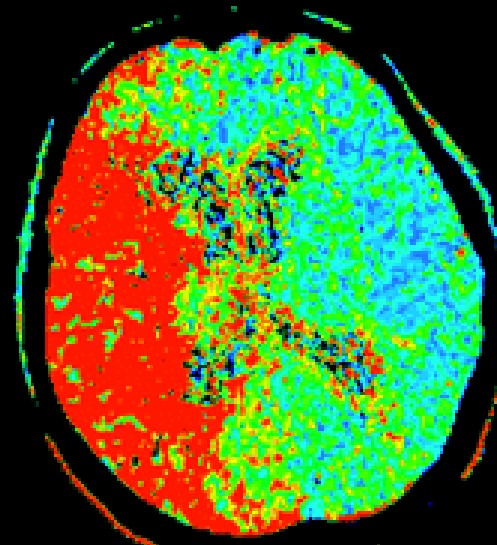
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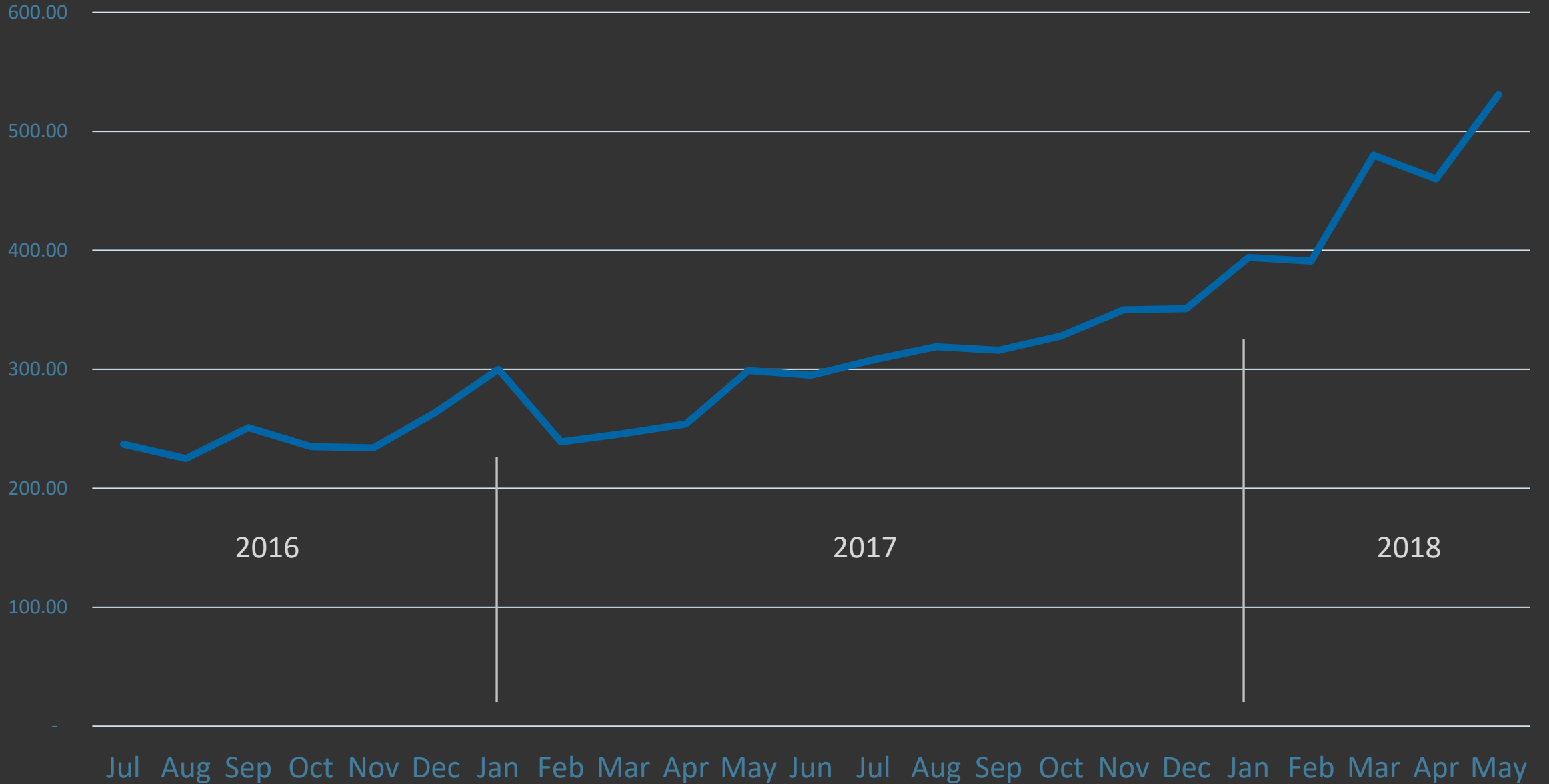
Cerebral
Blood
Flow

15.000

0



CT Cerebral Perfusion - Studies by Month



CT Perfusion – Time of Day (Jan-Jun)



The study upon which all else hinges.

Non-contrast CT is still the critical first step

Time is brain.

- ▶ I see no hemorrhage
 - ▶ I click the critical finding button
 - ▶ The system auto-dials the ordering physician
 - ▶ I relay the info so they can administer tPA
 - ▶ Time elapsed: under 7 minutes on average

A wider window of treatment time means more head CTs will be ordered, resulting in lives saved and reduced long-term disability for many stroke victims.



Stroke Certification

Acute Stroke Ready Hospital (ASRH) for hospitals or emergency centers with a dedicated stroke-focused program

Primary Stroke Center (PSC) for hospitals providing the critical elements to achieve long-term success in improving outcomes

Thrombectomy-Capable Stroke Center (TSC) for hospitals providing endovascular procedures and post-procedural care (newly introduced in January 2018)

Comprehensive Stroke Center (CSC), the most demanding certification, for hospitals that have specific abilities to receive and treat the most complex stroke cases.



Imaging Requirements

- CT or MRI, read 24 hours/day, results within 45 minutes
- Ability to administer tPA
- Monitor door to transfer time

ASRH plus...

- CTA or MRA capabilities and fast diagnosis

*1/3 have endovascular capability

PSC plus...

- Read by fellowship trained neuroradiologist 24/7
- Carotid duplex capabilities
- Intra-arterial thrombolytics

TSC plus...

- ICH score
- Arrival time to skin puncture
- Endovascular therapy capable

Illustration courtesy of The Joint Commission.

New Guidelines from AHA/ASA – March 2018

AHA/ASA Guideline

2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke

Background and Purpose—The purpose of these guidelines is to provide an up-to-date comprehensive set of recommendations for clinicians caring for adult patients with acute arterial ischemic stroke in a single document. The intended audiences are prehospital care providers, physicians, allied health professionals, and hospital administrators. These guidelines supersede the 2013 guidelines and subsequent updates.

William J. Powers, MD, FAHA, Chair; Alejandro A. Rabinstein, MD, FAHA, Vice Chair; Teri Ackerson, BSN, RN; Opeolu M. Adeoye, MD, MS, FAHA; Nicholas C. Bambakidis, MD, FAHA; Kyra Becker, MD, FAHA; José Biller, MD, FAHA; Michael Brown, MD, MSc; Bart M. Demaerschalk, MD, MSc, FAHA; Brian Hoh, MD, FAHA; Edward C. Jauch, MD, MS, FAHA; Chelsea S. Kidwell, MD, FAHA; Thabele M. Leslie-Mazwi, MD; Bruce Ovbiagele, MD, MSc, MAS, MBA, FAHA; Phillip A. Scott, MD, MBA, FAHA; Kevin N. Sheth, MD, FAHA; Andrew M. Southerland, MD, MSc; Deborah V. Summers, MSN, RN, FAHA; David L. Tirschwell, MD, MSc, FAHA; on behalf of the American Heart Association Stroke Council

Background and Purpose—The purpose of these guidelines is to provide an up-to-date comprehensive set of recommendations for clinicians caring for adult patients with acute arterial ischemic stroke in a single document. The intended audiences are prehospital care providers, physicians, allied health professionals, and hospital administrators. These guidelines supersede the 2013 guidelines and subsequent updates.

Methods—Members of the writing group were appointed by the American Heart Association Stroke Council's Scientific Statements Oversight Committee, representing various areas of medical expertise. Strict adherence to the American Heart Association conflict of interest policy was maintained. Members were not allowed to participate in discussions or to vote on topics relevant to their relations with industry. The members of the writing group unanimously approved all recommendations except when relations with industry precluded members voting. Prerelease review of the draft guideline was performed by 4 expert peer reviewers and by the members of the Stroke Council's Scientific Statements Oversight

The American Heart Association makes every effort to avoid any actual or potential conflicts of interest that may arise as a result of an outside relationship or a personal, professional, or business interest of a member of the writing panel. Specifically, all members of the writing group are required to complete and submit a Disclosure Questionnaire showing all such relationships that might be perceived as real or potential conflicts of interest.

This guideline was approved by the American Heart Association Science Advisory and Coordinating Committee on November 29, 2017, and the American Heart Association Executive Committee on December 11, 2017. A copy of the document is available at <http://professional.heart.org/statements> by using either "Search for Guidelines & Statements" or the "Browse by Topic" area. To purchase additional reprints, call 843-216-2533 or e-mail kelle.ramsey@wolterskluwer.com.

Data Supplement 1 (Evidence Tables) is available with this article at <http://stroke.ahajournals.org/lookup/suppl/doi:10.1161/STR.000000000000158/-DC1>. Data Supplement 2 (Literature Search) is available with this article at <http://stroke.ahajournals.org/lookup/suppl/doi:10.1161/STR.000000000000158/-DC2>. The American Heart Association requests that this document be cited as follows: Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, Biller J, Brown M, Demerschalk BM, Hoh B, Jauch EC, Kidwell CS, Leslie-Mazwi TM, Ovbiagele B, Scott PA, Sheth KN, Southerland AM, Summers DV, Tirschwell DL; on behalf of the American Heart Association Stroke Council. 2018 Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. 2018;49:e46-e99. doi: 10.1161/STR.000000000000158.

The expert peer review of AHA-commissioned documents (eg, scientific statements, clinical practice guidelines, systematic reviews) is conducted by the AHA Office of Science Operations. For more on AHA statements and guidelines development, visit <http://professional.heart.org/statements>. Select the "Guidelines & Statements" drop-down menu, then click "Publication Development."

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DOI: 10.1161/STR.000000000000158

2.2. Brain Imaging

2.2. Brain Imaging	COR	LOE	New, Revised, or Unchanged
1. All patients admitted to hospital with suspected acute stroke should receive brain imaging evaluation on arrival to hospital. In most cases, noncontrast CT (NCCT) will provide the necessary information to make decisions about acute management.	I	B-NR	Recommendation revised from 2013 AIS Guidelines.
Diagnostic testing is most cost-effective when it leads to a change in treatment that improves outcomes, not just a change in treatment. Although diffusion-weighted magnetic resonance imaging (DW-MRI) is more sensitive than CT for detecting AIS, ^{66,67} routine use in all patients with AIS is not cost-effective. ^{68,69} NCCT scanning of all patients with acute stroke has been shown to be cost-effective primarily because of the detection of acute ICH and the avoidance of antithrombotic treatment in these patients. ⁷⁰ In many patients, the diagnosis of ischemic stroke can be made accurately on the basis of the clinical presentation and either a negative NCCT or one showing early ischemic changes, which can be detected in the majority of patients with careful attention. ^{66,71,72} In some patients with negative NCCT such as those with puzzling clinical presentations or those with uncertain clinical stroke localization for early carotid endarterectomy (CEA) or stenting, demonstration of an area of restricted diffusion on DW-MRI may lead to a change in treatment that improves outcomes. There are inadequate data at this time to establish which patients will benefit from DW-MRI, and more research is needed to determine criteria for its cost-effective use.			See Table XV in online Data Supplement 1.
2. Systems should be established so that brain imaging studies can be performed within 20 minutes of arrival in the ED in at least 50% of patients who may be candidates for IV alteplase and/or mechanical thrombectomy.	I	B-NR	New recommendation.
The benefit of both IV alteplase and mechanical thrombectomy is time dependent, with earlier treatment within the therapeutic window leading to bigger proportional benefits. ^{32,73} A brain imaging study to exclude ICH is recommended as part of the initial evaluation of patients who are potentially eligible for these therapies. Reducing the time interval from ED presentation to initial brain imaging can help to reduce the time to treatment initiation. Studies have shown that median			See Table XVI in online Data Supplement 1.

American College of Cardiology – May 2018



AMERICAN COLLEGE of CARDIOLOGY

Clinical Topics Latest In Cardiology Education and Meetings Tools

2018 AHA/ASA Stroke Early Management Guidelines

May 09, 2018 | Margaret Leslie McDermott, MD, MS

Share via: 406 Print

Authors: Powers WJ, Rabinstein AA, Ackerson T, et al., on behalf of the American Heart Association Stroke Council.

Citation: 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke* 2018;49:e46-e110. [↗](#)

Editor's Note: The American Heart Association and the American Stroke Association released several clarifications, updates, and/or modifications to the 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke on April 18, 2018. The following Key Points to Remember are not impacted by these changes.

The following are key points to remember from the American Heart Association (AHA)/American Stroke Association (ASA) 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke:

1. These 2018 guidelines are an update to the 2013 guidelines, which were published prior to the six positive “early window” mechanical thrombectomy trials (MR CLEAN,

Guide

All T

These 2018 guidelines are an update to the 2013 guidelines, which were published prior to the six positive “early window” mechanical thrombectomy trials (MR CLEAN, ESCAPE, EXTEND-IA, REVASCAT, SWIFT PRIME, THRACE) that emerged in 2015 and 2016. In addition, in the last 3 months, two trials (DAWN and DEFUSE 3) showed a clear benefit of “extended window” mechanical thrombectomy for certain patients with large vessel occlusion who could be treated out to 16-24 hours.

Font Si

The benefits of intravenous (IV) tissue plasminogen activator (tPA) are time-dependent, and treatment for eligible patients should be initiated as quickly as possible (even for patients who may also be candidates for mechanical thrombectomy).

IV tPA should be administered to all eligible acute stroke patients within 3 hours of last known normal and to a more selective group of eligible acute stroke patients (based on ECASS III exclusion criteria) within 4.5 hours of last known normal. Centers should attempt to achieve door-to-needle times of <60 minutes in ≥50% of stroke patients treated with IV tPA.

Centers should attempt to obtain a noncontrast head CT within 20 minutes of arrival in ≥50% of stroke patients who may be candidates for IV tPA or mechanical thrombectomy.

The Alberta stroke programme early CT score (ASPECTS)

10-point quantitative topographic CT scan score used in patients with middle cerebral artery stroke

Subganglionic Nuclei

- M1 Frontal operculum -1
- M2 Anterior temporal lobe -1
- M3 Posterior temporal lobe -1

Supraganglionic Nuclei

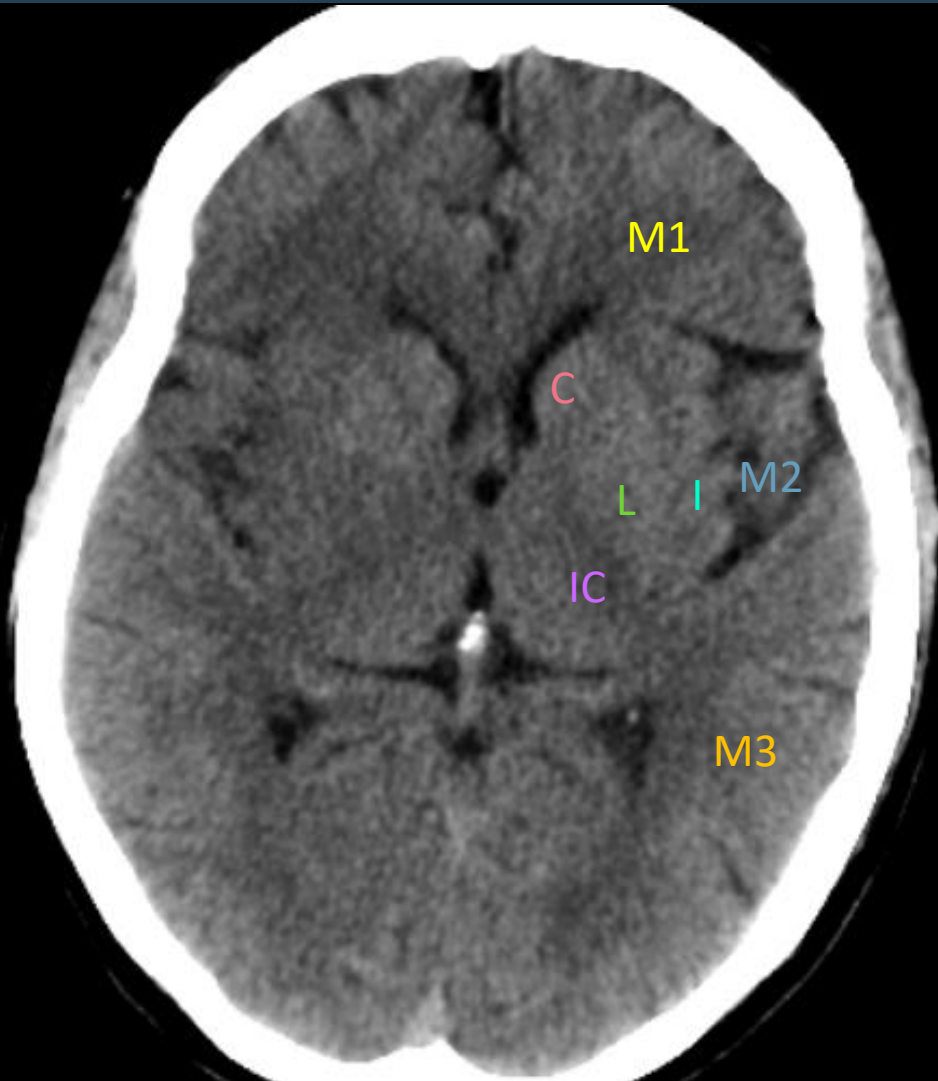
- M4 Anterior MCA -1
- M5 Lateral MCA -1
- M6 Posterior MCA -1

Basal Ganglia

- Caudate (C) -1
- Lentiform Nucleus (L) -1
- Insula (I) -1
- Internal Capsule (IC) any part -1

Total ASPECTS Score /10

Each area of grey white loss constitutes 1 deduction point



Strategies for Success in the New Paradigm

Logistical Challenges of Stroke Imaging

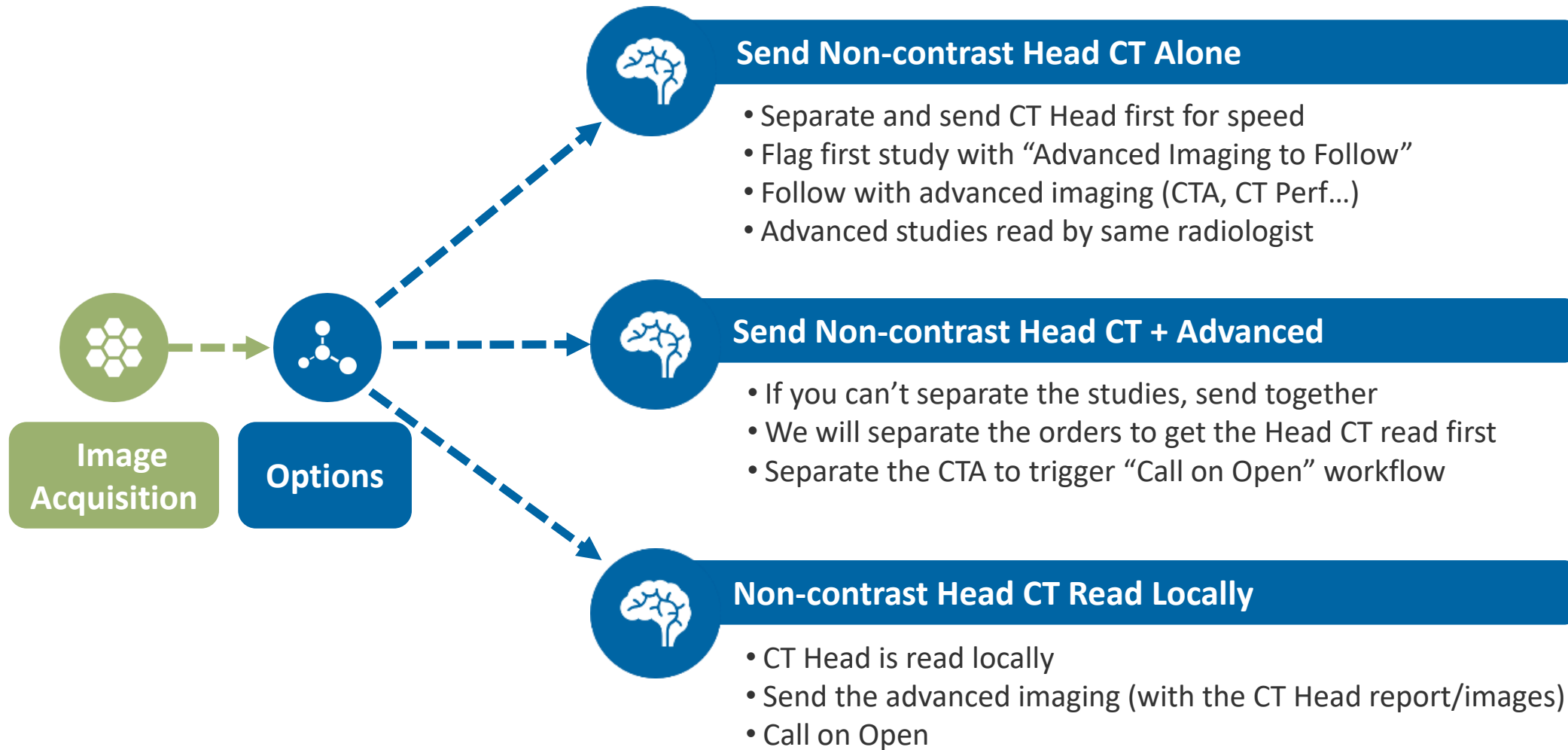
Speed of Interpretation for Non-Contrast Head CT

Coordination of CT Perfusion and CTA imaging

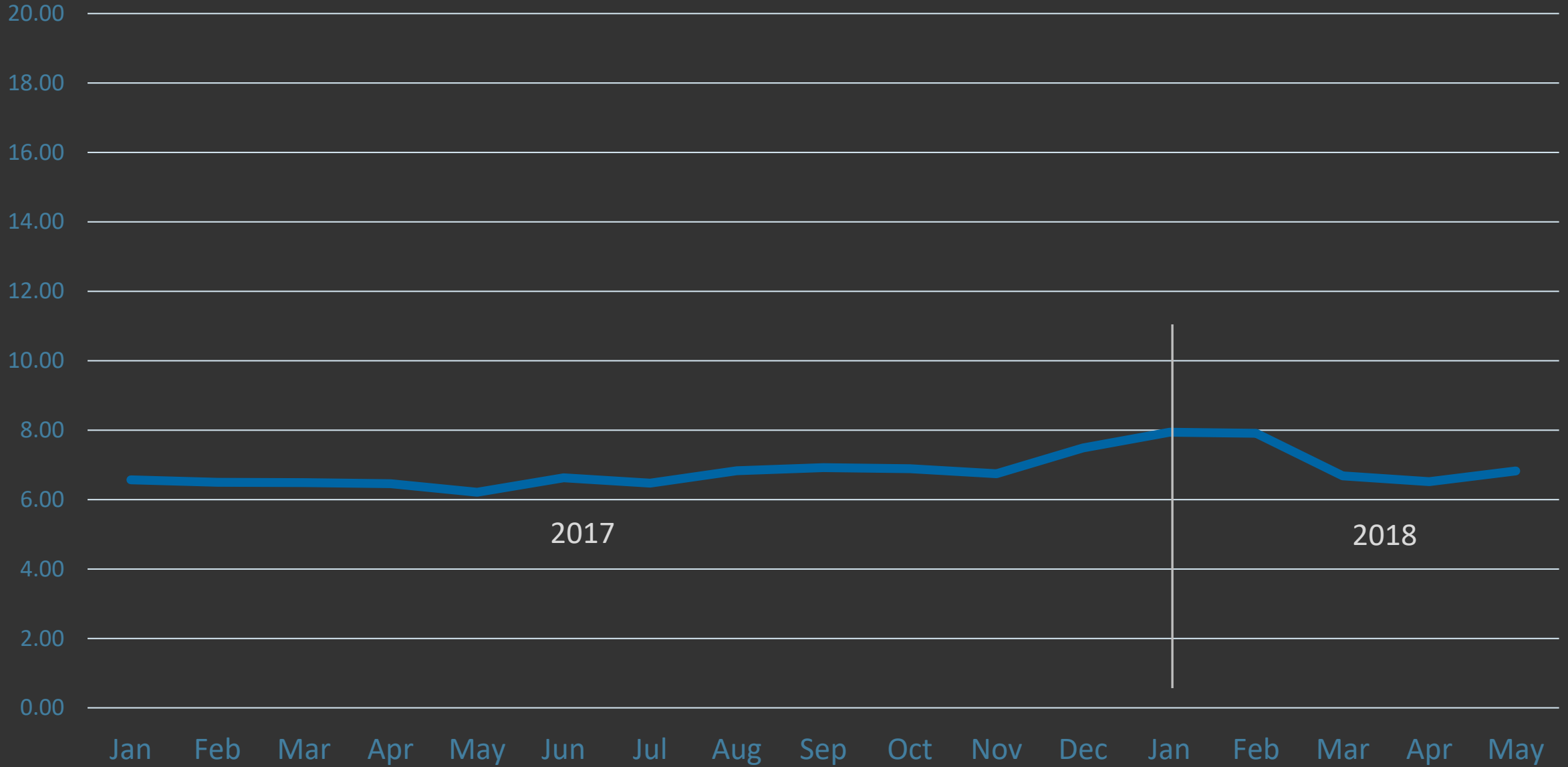
Billing

Logistics of Image Set Management

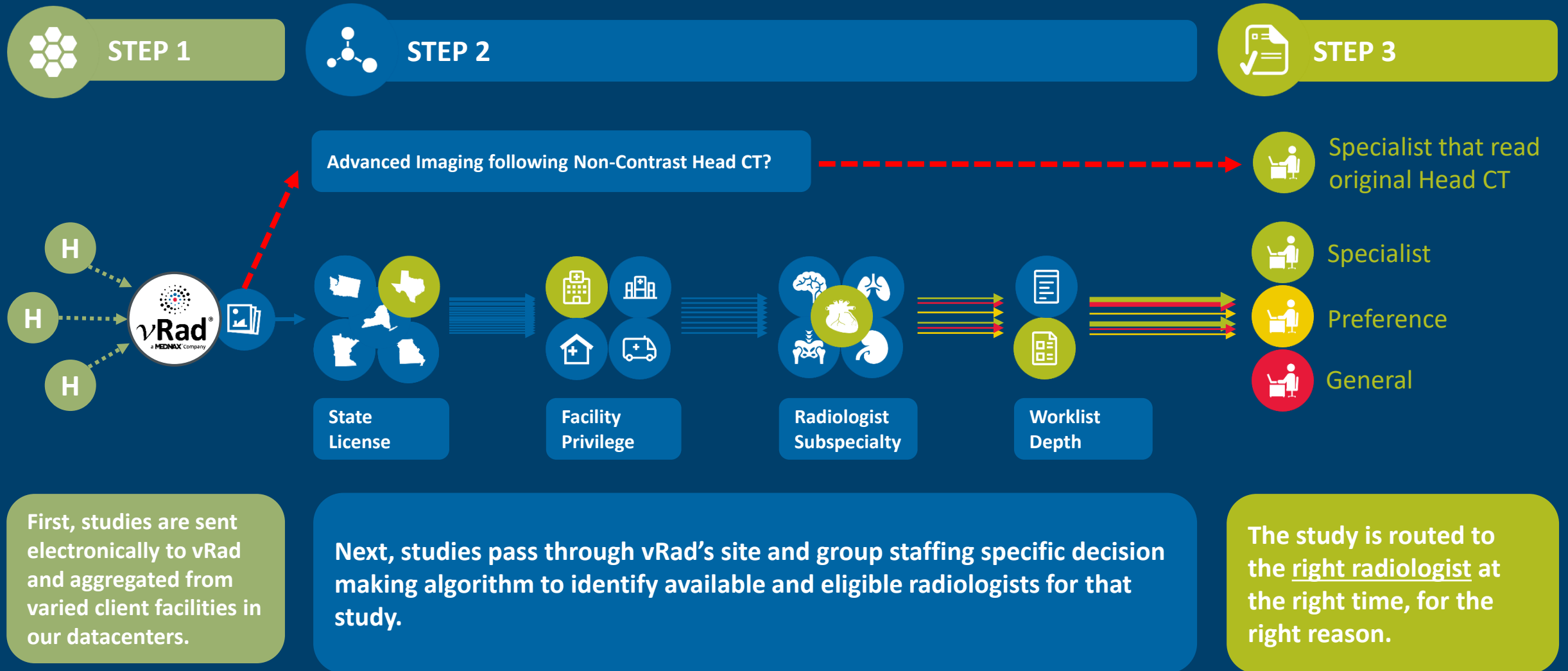
Establish a protocol for creating separate images sets to unlock separate workflows—maximizing speed and communications efficiency



Average TAT | Non-Contrast Head CT | 74,900 Studies



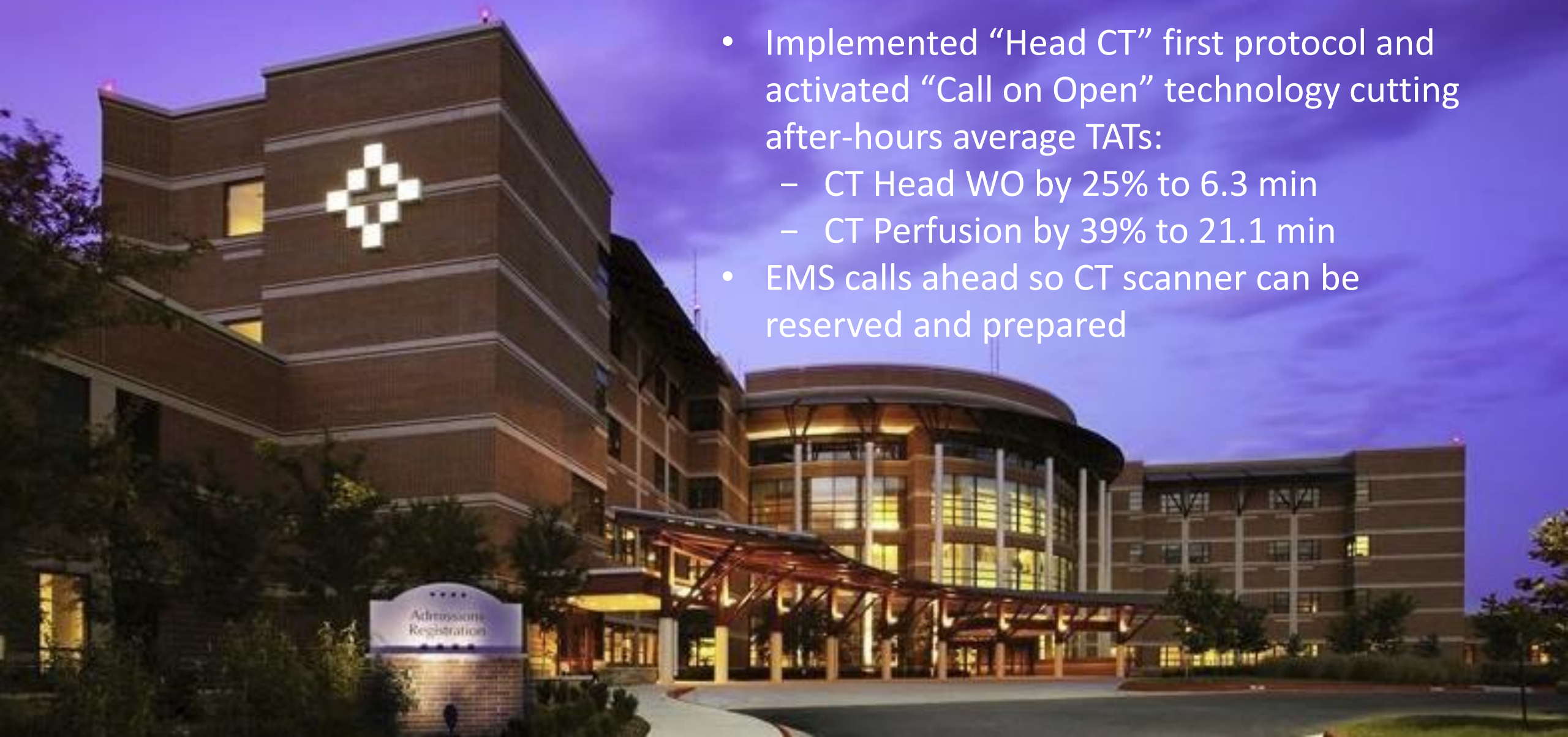
Route Subsequent Studies to Same Radiologist



Washington Regional Medical Center

Comprehensive Stroke Center | Fayetteville, AR

- Implemented “Head CT” first protocol and activated “Call on Open” technology cutting after-hours average TATs:
 - CT Head WO by 25% to 6.3 min
 - CT Perfusion by 39% to 21.1 min
- EMS calls ahead so CT scanner can be reserved and prepared



Prepare and Take Advantage

- Prepared for the 9am perfusion studies? (Causing stress for some providers, but should be viewed as an opportunity!)
- Leverage partnerships to round out 24-hour subspecialist coverage
- vRad Neuroradiology Team
 - 75+ Neuroradiologists
 - 24/7 coverage
 - 73,000+ Stroke studies annually
 - Average TAT of 6.53 min on 53,000 Non-contrast Head CTs in 2017
 - 3,000 CT Cerebral Perfusion studies annually
 - Serve 1,400 facilities for stroke, including 20% of US Stroke Centers

Q&A

Use “Chat” to ask questions now:

Ask questions in this space
in the Chat.

