Q&A Rounds: Quicr Project Webinar
Grey Nuns Community Hospital

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Disclosure

- No Honoraria for current presentation.
- Have Received Honoraria from Bristol-Myers Sqibb, Sanofi Aventi, Allergan and Boehringer Ingelheim.
- No other financial interests to disclose.

Objectives

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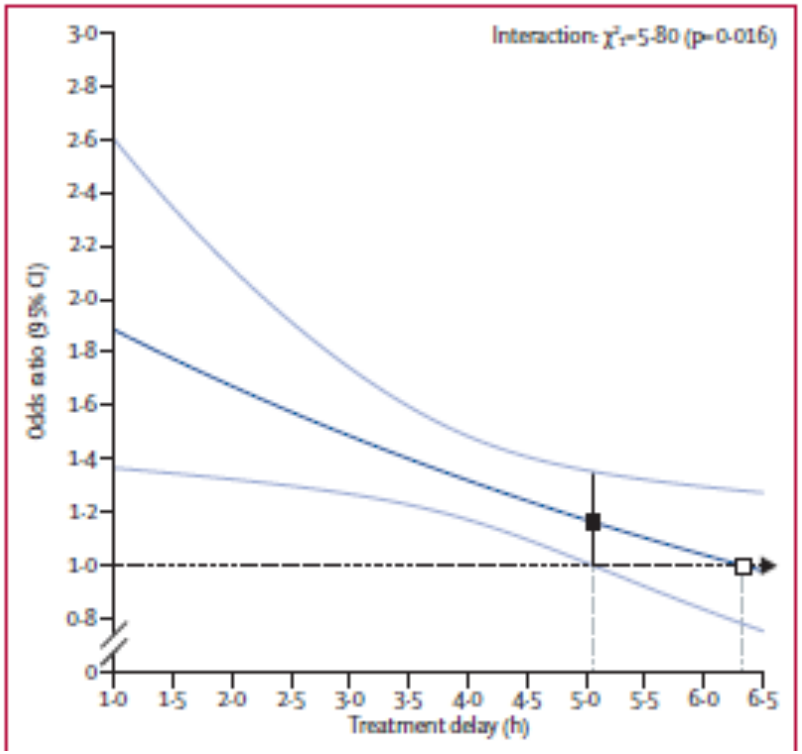
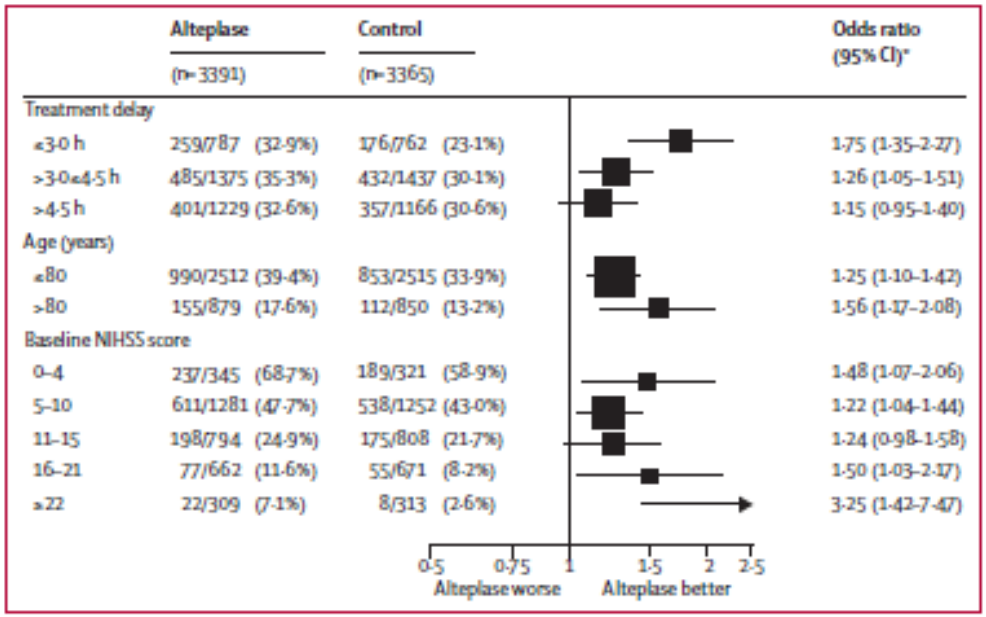
DTN discussion, highlighting outliers and instituting where necessary awareness or systemic changes to prevent.

CT/CTA Protocol, Acute Stroke-After hours

…Context





	Alteplase (n=3391)	Control (n=3365)	Odds ratio (95% CI)*
Treatment delay			
≤3·0 h	259/787 (32·9%)	176/762 (23·1%)	1·75 (1·35–2·27)
>3·0–≤4·5 h	485/1375 (35·3%)	432/1437 (30·1%)	1·26 (1·05–1·51)
>4·5 h	401/1229 (32·6%)	357/1166 (30·6%)	1·15 (0·95–1·40)
Age (years)			
≤80	990/2512 (39·4%)	853/2515 (33·9%)	1·25 (1·10–1·42)
>80	155/879 (17·6%)	112/850 (13·2%)	1·56 (1·17–2·08)
Baseline NIHSS score			
0–4	237/345 (68·7%)	189/321 (58·9%)	1·48 (1·07–2·06)
5–10	611/1281 (47·7%)	538/1252 (43·0%)	1·22 (1·04–1·44)
11–15	198/794 (24·9%)	175/808 (21·7%)	1·24 (0·98–1·58)
16–21	77/662 (11·6%)	55/671 (8·2%)	1·50 (1·03–2·17)
>22	22/309 (7·1%)	8/313 (2·6%)	3·25 (1·42–7·47)

Figure 2: **Effect of alteplase on good stroke outcome (mRS 0–1), by treatment delay, age, and stroke severity**
*For each of the three baseline characteristics, estimates were derived from a single logistic regression model stratified by trial, which enables separate estimation of the OR for each subgroup after adjustment for the other two baseline characteristics (but not for possible interactions with those characteristics). mRS=modified Rankin Scale.

The evidence for tPA given < 4.5 hours from onset in ischemic stroke is compelling. The elderly benefit as much or more

Pooled metaanalysis of all 9 trials of tPA; >6500 patients

www.thelancet.com Published online August 6, 2014 http://dx.doi.org/10.1016/S0140-6736(14)60584-5

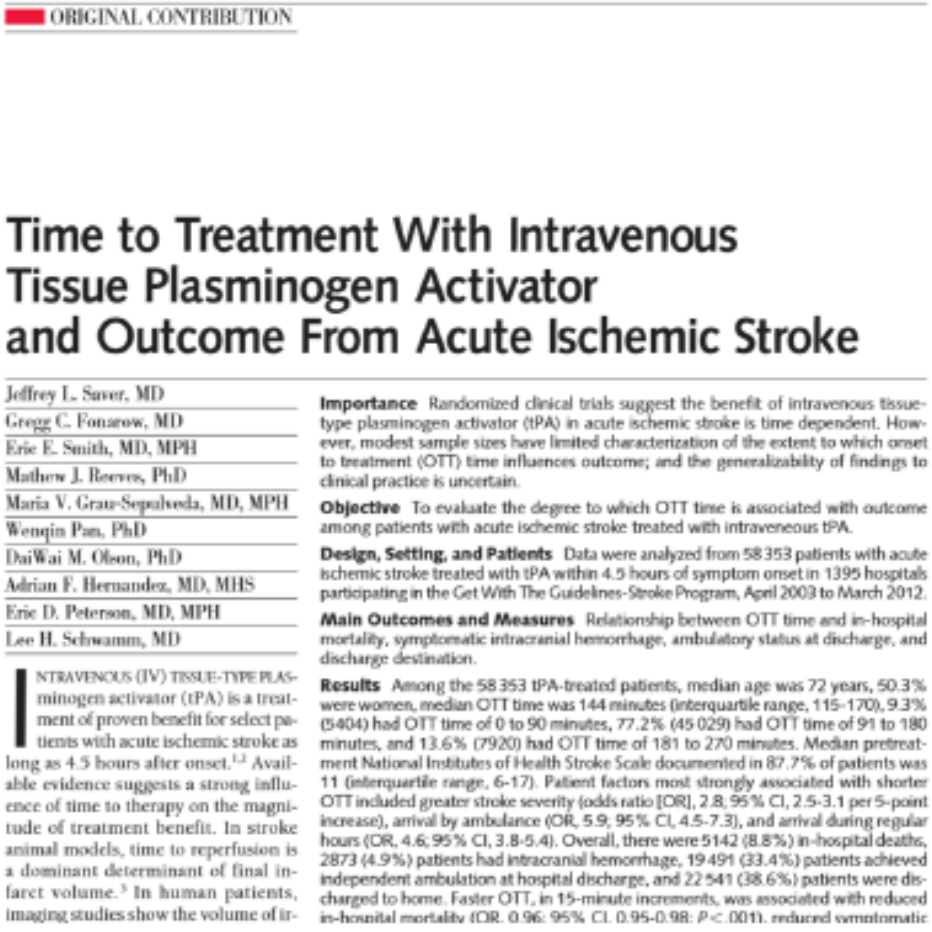
Shorter DTN = better outcomes

» Every 15 min drop in DTN associated with a 5% reduction in mortality (OR 0.95; $p<0.0001$)

» Those with DTN < 60 min have reduced risk of intracranial hemorrhage 4.7% vs 5.6%

Fonarow, Circulation 2011

Speed Matters!



ORIGINAL CONTRIBUTION

Time to Treatment With Intravenous Tissue Plasminogen Activator and Outcome From Acute Ischemic Stroke

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Importance Randomized clinical trials suggest the benefit of intravenous tissue-type plasminogen activator (tPA) in acute ischemic stroke is time dependent. However, modest sample sizes have limited characterization of the extent to which onset to treatment (OTT) time influences outcome; and the generalizability of findings to clinical practice is uncertain.

Objective To evaluate the degree to which OTT time is associated with outcome among patients with acute ischemic stroke treated with intravenous tPA.

Design, Setting, and Patients Data were analyzed from 58 353 patients with acute ischemic stroke treated with tPA within 4.5 hours of symptom onset in 1395 hospitals participating in the Get With The Guidelines-Stroke Program, April 2003 to March 2012.

Main Outcomes and Measures Relationship between OTT time and in-hospital mortality, symptomatic intracranial hemorrhage, ambulatory status at discharge, and discharge destination.

Results Among the 58 353 tPA-treated patients, median age was 72 years, 50.3% were women, median OTT time was 144 minutes (interquartile range, 115-170), 9.3% (5404) had OTT time of 0 to 90 minutes, 77.2% (45 029) had OTT time of 91 to 180 minutes, and 13.6% (7920) had OTT time of 181 to 270 minutes. Median pretreatment National Institutes of Health Stroke Scale documented in 87.7% of patients was 11 (interquartile range, 6-17). Patient factors most strongly associated with shorter OTT included greater stroke severity (odds ratio [OR], 2.8; 95% CI, 2.5-3.1 per 5-point increase), arrival by ambulance (OR, 5.9; 95% CI, 4.5-7.3), and arrival during regular hours (OR, 4.6; 95% CI, 3.8-5.4). Overall, there were 5142 (8.8%) in-hospital deaths, 2873 (4.9%) patients had intracranial hemorrhage, 19 491 (33.4%) patients achieved independent ambulation at hospital discharge, and 22 541 (38.6%) patients were discharged to home. Faster OTT, in 15-minute increments, was associated with reduced in-hospital mortality (OR, 0.96; 95% CI, 0.95-0.98; $P < .001$), reduced symptomatic

INTRAVENOUS (IV) TISSUE-TYPE PLASminogen activator (tPA) is a treatment of proven benefit for select patients with acute ischemic stroke as long as 4.5 hours after onset.[1,2] Available evidence suggests a strong influence of time to therapy on the magnitude of treatment benefit. In stroke animal models, time to reperfusion is a dominant determinant of final infarct volume.[3] In human patients, imaging studies show the volume of tr-

JAMA. 2013;309(23):2480-2488

For 1000 treated patients, every 15-minutes of faster treatment resulted in:

- 18 more patients with improved ambulation at discharge
- 8 more with fully independent ambulation
- 7 more discharged home

DTN GNCH: Feb

Notes
CTA ON-SITE 18:25; Delay due to rest clock for relapsing deficit, Proximal M2 occlusion sent to UAH, successful thrombectomy.
Wake up stroke; Delay due to the fact that patient was triaged by EMS as time of onset the following night >24 h; only after review of initial CT of patient was it apparent that patient's symptoms likely started shortly prior to transfer, collateral history sought from husband for interval temporal milestone prior to tPA admin,
Delay due to unusual presentation of acute cortical blindness, initially assessed in ER as "asymptomatic" due to visual confabulation, (Anton's syndrome)
CTA negative for occlusion onsite 15:58; Delay to uncertain time of onset, patient was travelling salesman, customer who witnessed event during presentation was contacted to verify time of onset, hence delay.
Delay, due to fact that patient did not come from EMS, no pre-hospt notifications, and patient insisted on delay until family could be contacted (overseas) for consent
Sent to UAH; no occlusion on CTA; f/u imaging showed no ischemic injury
tPA given as acceptable protocol violation due to isolated aphasia

DTN GNCH: March

Notes
CTA obtained in house acutely via remote discussion with tech
Delay due atrial fibrillation necessitating coags, patient sent to UAH for Endovascular not a candidate due to hemorrhagic transformation
Delay due to seizure at onset and atrial fibrillation necessitating coags, patient sent to UAH for Endovascular not a candidate for poor penumbra

Detailed Review…

- From the Canadian Best Practice Guidelines: Hyper-Acute Stroke: http://onlinelibrary.wiley.com/doi/10.1111/ijs.12551/ful
- **Section 3: Emergency Department Evaluation and**
- **Management of Acute Stroke**
- **Time is Brain!** The goal of ED management is rapid assessment of
- all patients with a suspected acute stroke.
- Performance indicators regarding time to imaging, tPA, and laboratory investigation detailed.
- Management of Potential Hyperacute complications eg. Seizures and Labile Hypertention recommended.
- …How to implement “Prompt Stroke Recognition”?

Case Review: 1

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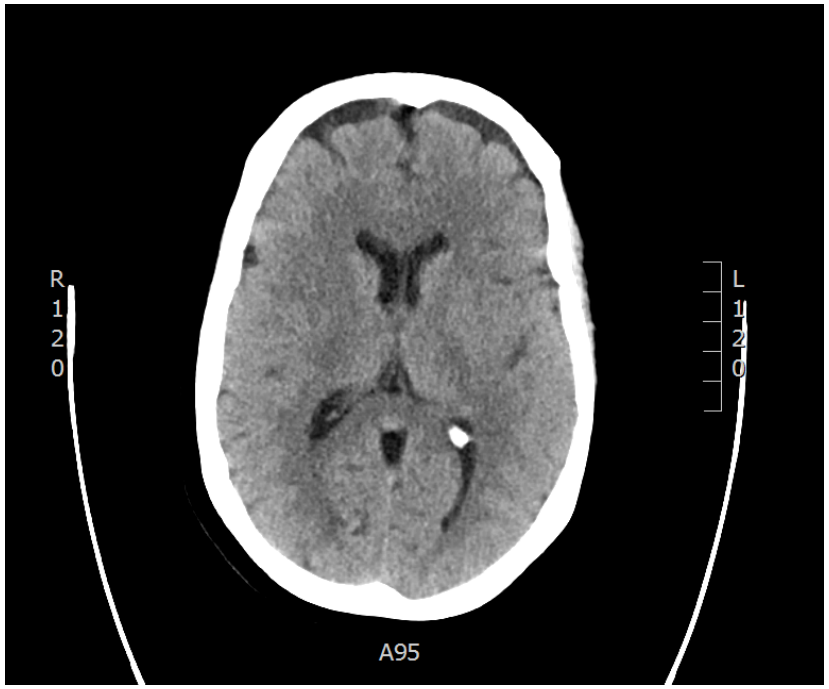
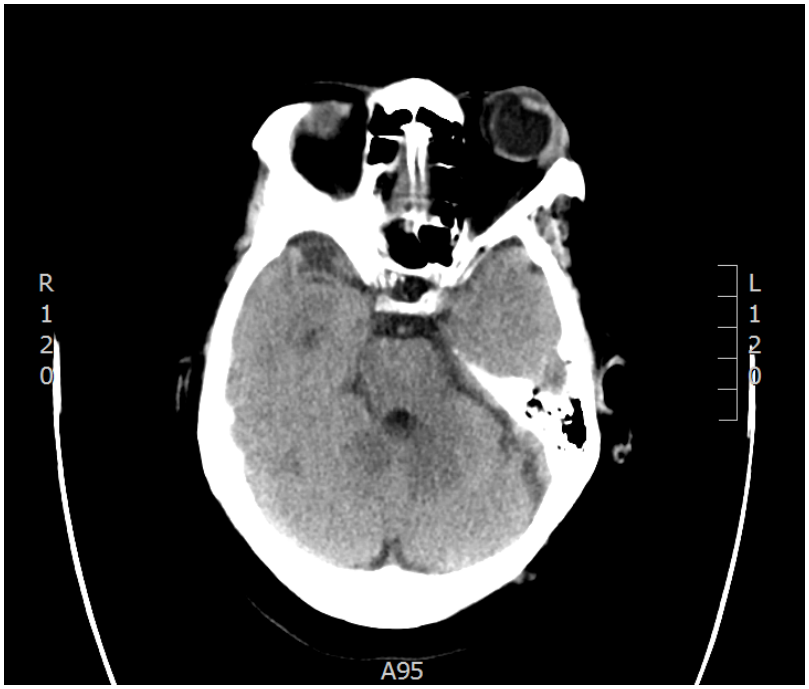
Case 1: Review

- Patient was not transported as Acute Stroke-Pre-Hospital.
- Upon Arrival: Acute Stroke Not within Time Window: Imaging protocol for Hyper-acute Stroke Not Mobilized.
- Time to First Image: 33 min cf. 10 min median time.

Case 1: Review





- NIH 17, Hemiplegia, Hemineglect, Aspects >6
- “Treat the Scan”?

Case 1 Review:

- Further Historical Details:
- Patient's Husband contacted, Patient Ambulatory and complaining of having "dizziness" at 11:30 am.
- Hemiplegia on initial assessment by EMS.
- Systolic BP in ER 88, on site 120.
- Thus CTA requested while awaiting to rule out aortic dissection.
- Time of First Imaging: 13:03, Time of CTA 15:02.
- Delay, as Radiologist contacted for approval in violation of established site protocol, wherein hyper-acute patients CTA may be directly ordered by on call Neurologist.
- Contributory factors included, lack of awareness by CT tech, as well as "New Physician" on call.

Case 1: Q&A

- Delay due to absence of pre-hospital notification and presumed time of onset.
- Imaging Protocols both for initial CT, and Subsequent CTA not mobilized.
- Systemic Changes:
- (Re) Education of Triage Nursing Staff.
- (Re) Education of CT Tech, and On call Physicians, “On Call” Schedule for Stroke posted in Radiology.

DATE: March 24/16
TO: ED Staff
FROM: Darla Reynolds
Program Manager,
Department of Emergency
RE: Paging Neurology from Triage

Hello everyone – congratulations and thank you for the continued dedication to the hot stroke process – our DTN times are fantastic. Let's keep up the great work!

Dr Siddiqui has been very clear in his support that triage nurses and charge nurses are to page neurology for all acute stroke presentations and TIA presentations at the time of their presentation to this department.

This includes, but is not limited to acute strokes, all strokes under the age of 55, wake up strokes regardless of when last seen normal, strokes progressing to stupor or coma, strokes that might sound like they are out of the window but symptoms are progressing (Stroke in Evolution) , and Transient Ischemic Attacks that have recently resolved. Rapidly improving stroke symptoms with reoccurring deficits should also be called immediately to neurology.

Please have a very high index of suspicion for all pts who present with stroke like symptoms and page the Neurologist on call.

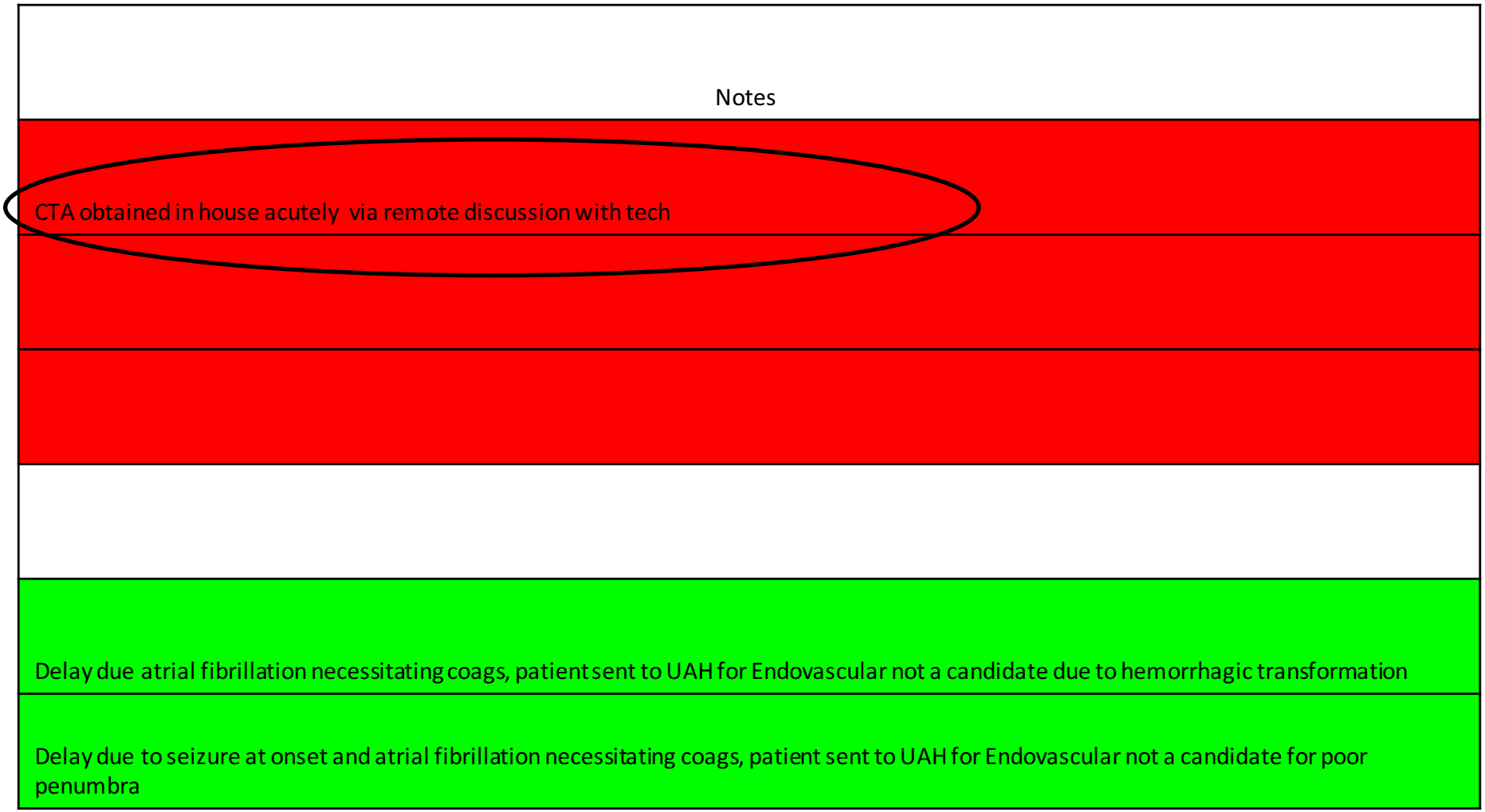
If you get any negative feedback from a neurologist when you page them please email me directly and I will forward this concern to Dr Siddiqui.

Thank you! You are changing the lives of our stroke patients.

Action plan(s)

- Awareness at Triage for Atypical Presentations.
- Awareness at CT of default pathway <11:00 pm. Post 11:00 pm-direct to UAH for High prob Endovascular Cases, urgent discussion with radiology for alternate acute afterhours CTA cases eg. Fluctuating deficit suspected Basilar occlusion. TIA cases to be deferred to am as per protocol.

Case 2: Review



Case 2: Review

- Patient presented with Acute Stroke, however transported by Son (NO pre-hospital notification), 7:30 am. Code Stroke Called.
- Unable to Weight Bear, Left Hemiparesis and Dysarthria.
- ER CO called Stroke on call, immediately while patient en route to CT, Deficits “Fully resolved”.
- Stroke Nurses accompanied patient to CT as per protocol with tPA kit.
- En-route Neurologist called CT tech directly,
- And discussed patient with tech and nurse. Patient verified to be asymptomatic at time of CT, recurrent symptoms as test complete: 7:58. Images reviewed remotely, patient verified to be candidate, however systolic pressure 220, iv labetalol administered by stroke nurse and patients CTA acquired, after telephone verbal order to CT tech.
- Patient returned to OBS bed for second dose of labetalol upon arrival of Neurologist, CTA complete, no proximal occlusion.
- NIH 8, tPA given.
- DTN 48 minutes (cf. case 1: 180 min.), Onset to Needle: 25 minutes.
- NIH 24 hours: 1.

Conclusion

- Recognition of Atypical Presentations and Rapid Assessment of “Protocol Violations” are important for timely intervention.
- Systemic Changes focused on identifying “High risk” patients and early communication with Neurologist and DI CAN be instituted to insure prompt identification of this elusive patient population.
- “Don’t let your patient be a Wallflower”!

Questions?

Thank You!