Saving More Brain Cells by Reducing Time to Alteplase (tPA) on Eligible Stroke Patients

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BACKGROUND

Early thrombolysis in acute ischemic stroke is associated with improved outcomes. For each minute that brain tissue is not perfused, 1.9 million neurons are lost. Current guidelines emphasize early delivery of intravenous (IV) Alteplase (tPA) within at least 60 minutes of hospital arrival.

PURPOSE

We sought to achieve average DTN time of ≤ 30 minutes in eligible patients.

METHODS

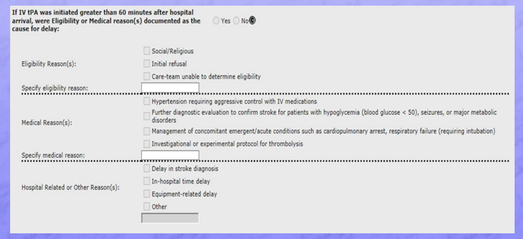
- A multidisciplinary team was established.
- Goal timeframes for the subcomponents of the process were determined.
- A fishbone diagram was used to identify barriers.

- Subgroups focused on main areas identified (i.e. Scan interpretation, Location of tPA administration, Documentation and communication, and Completion of ancillary tasks prior to tPA..
- A tracking feedback tool was used for consistent

Timestamps (ND=Not Documented)

Door to:	ED MD Assessment	Stroke Team Activated	Acute Stroke CTOH Order Placed	Stroke Team Arrived	CT Begin	CT Complete	CT Interpretation Communicated	Glucose Resulted	tPA Bolus
CLOCK TIME	4/23/2018 16:49	4/23/2018 16:49	UNKNOWN	4/23/2018 16:49	4/23/2018 16:48	4/23/2018 16:49	4/23/2018 16:54	4/23/2018 16:55	4/23/2018 17:01
ACTUAL	0:03	0:03		0:00	0:02	0:03	0:08	0:09	0:15
TARGET	≤ 5	≤ 7	≤ 7	≤ 5 from activation	≤ 12	≤ 15	≤ 22	≤ 22	≤ 30

- Eligible patients included those meeting Get With The Guidelines (GWTG) criteria for timely tPA administration.


If IV tPA was initiated greater than 60 minutes after hospital arrival, were Eligibility or Medical reason(s) documented as the cause for delay: ☐ Yes ☐ No

Eligibility Reason(s): ☐ Social/Religious ☐ Initial refusal ☐ Care-team unable to determine eligibility

Specify eligibility reason:

Medical Reason(s): ☐ Hypertension requiring aggressive control with IV medications ☐ Further diagnostic evaluation to confirm stroke for patients with hypoglycemia (blood glucose < 50), seizures, or major metabolic disorders ☐ Management of concomitant emergent/acute conditions such as cardiopulmonary arrest, respiratory failure (requiring intubation) ☐ Investigational or experimental protocol for thrombolysis

Specify medical reason:

Hospital Related or Other Reason(s): ☐ Delay in stroke diagnosis ☐ In-hospital time delay ☐ Equipment-related delay ☐ Other

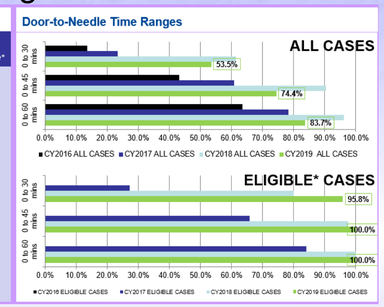
RESULTS

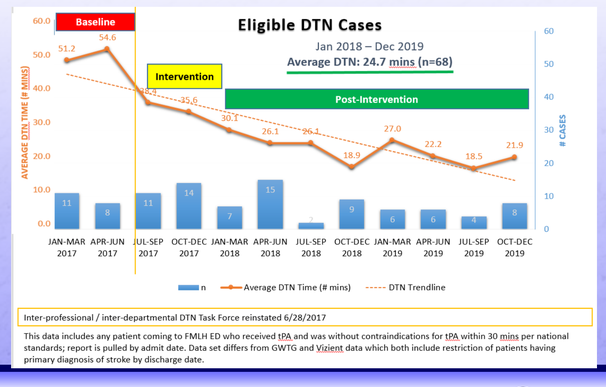
- Average DTN times were reduced from an average of 56.1 (Baseline) to 34.8 (Post-intervention) for all patients and 54.6 (Baseline) to 24.7 (Post-intervention) minutes for eligible patients.
- Average DTN time ≤ 30 minutes has been sustained nearly 24 months on eligible patients.
- The hemorrhagic complication rate has remained well below the national average.
- Calculations showed nearly four billion additional neurons might be saved with quicker intervention.

(2018, 2019)	Patients	Average Reduction from Baseline	Potential Neurons saved per minute brain perfused	Total Neuron potentially saved overall
Eligible (41, 24)	65	29.9 minutes	1,900,000	3,692,650,000
All (51, 43)	94	21.3 minutes	1,900,000	3,804,180,000

DTN Case Volume

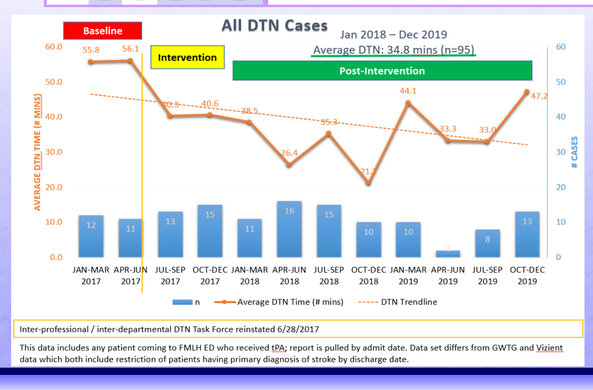
	2016 All	2017 All	2018 All	2019 All	2019 Eligible*
Jan	4	3	2	2	1
Feb	3	4	4	2	1
Mar	2	5	5	6	4
Apr	2	9	4	1	1
May	3	0	7	6	5
Jun	4	2	5	5	0
Jul	2	2	4	3	1
Aug	3	7	6	2	2
Sep	3	4	5	3	1
Oct	5	4	1	4	1
Nov	6	4	4	4	2
Dec	3	7	4	5	5
TOTAL	40	51	51	43	24





Inter-professional / inter-departmental DTN Task Force reinstated 6/28/2018

This data includes any patient coming to FMLH ED who received tPA and was without contraindications for tPA within 30 mins per national standards; report is pulled by admit date. Data set differs from GWTG and Vizient data which both include restriction of patients having primary diagnosis of stroke by discharge date.



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CONCLUSIONS

- Sustainable average DTN times ≤ 30 minutes for acute stroke are possible. A multidisciplinary approach with emphasis on a culture of teamwork and collaboration is essential. More brain cells can be saved.