Case Study 1

Improving tPA Rates to Enhance Quality of Life for Stroke Patients

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Local Problem

Time is brain- treating patients with the clot busting drug, tPA within recommended timeframes can prevent loss of brain function and help maximize the opportunity for recovery and quality of life.

During Greater Baltimore Medical Center's 2016 "Get with the Guidelines" Stroke survey, GBMC's tPA administration rate was lower than national and state benchmarks.

Why focus on tPA Treatment?

Aligns with GBMC's:

- Mission- Health, Healing and Hope
- Vision- "To every patient, every time, we will provide the care we would want for our own loved ones"
- Four Aims-
  - Better Health
  - Better Care
  - Least Waste
  - More Joy

Baseline Data:

2016 tPA Administration Rates

- 5.5%

GBMC Baseline tPA Administration Rate

- 10%

State tPA Administration Rate

- 11%

National tPA Administration Rate

GBMC Set Goals to:

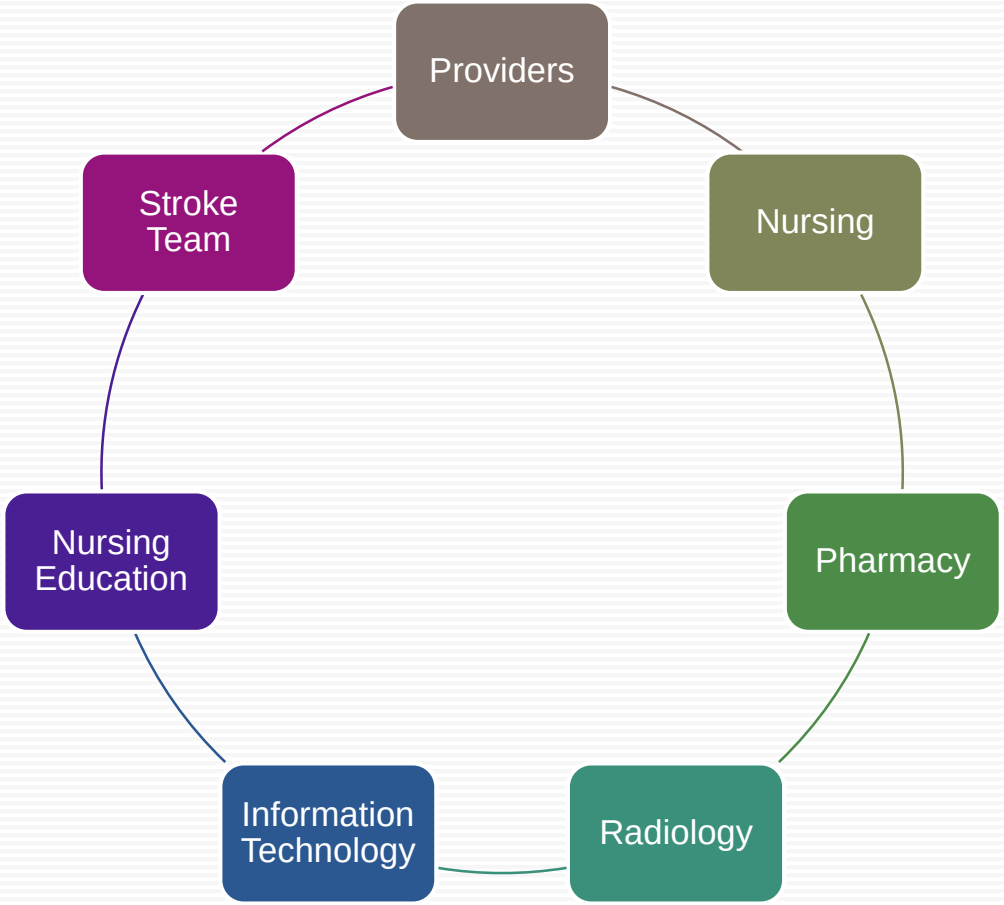
1. To improve recognition of qualified patients for tPA treatment.

2. To administer tPA more efficiently, safely, and exceed national and state benchmarks inline with American Heart Association's "Get with the Guidelines" standards (> 11% administration rate)
   a. Improve Door to CT time
   b. Improve Door to needle time

3. Leverage information system functionalities to meet these goals.

Design and Implementation:
Governance Strategy

- Collaborative effort between multiple disciplines
- Lead by Stroke Coordinator
- Kaizen Team Lead Facilitation



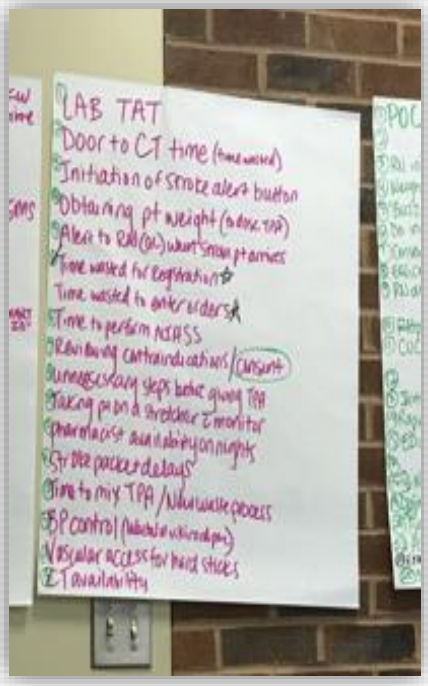
Design and Implementation:
Kaizen event focused on tPA Workflow

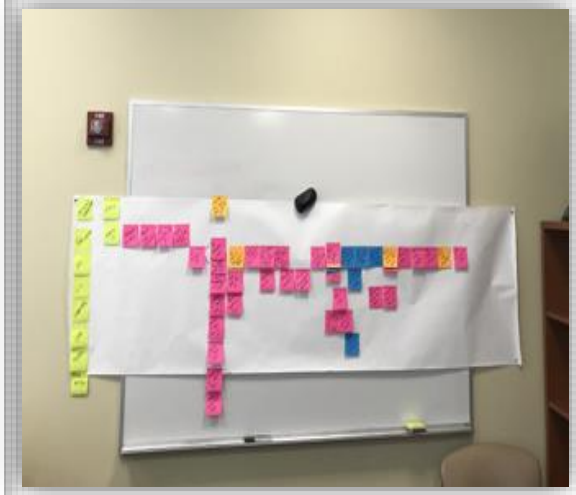
- Targeted redesign initiative (Kaizen) to evaluate current workflow and develop more efficient, standard workflow.

Typical Kaizen Week

GBMC

Day 1	Day 2	Day 3	Day 4	Day 5
Lean tool training	Identification of waste	Implementation of process changes	Train associates on process changes	"Go-live" with new process
Document current state map	Future state brainstorming of changes to eliminate waste	Document new work visuals, standards	Trial new process	Observe and support associates in work area
	Try-storming new ideas	Report-out on progress	Troubleshoot issues	Present summary to leadership
	Document future state map		Establish visual process dashboard	Report-out on progress
	Report-out on progress		Report-out on progress	





Design and Implementation:
tPA Treatment Strategies

Target 1 - Leverage EHR to identify more patients that could potentially be experiencing a stroke in both the ED and inpatient areas.

Target 2 –Develop and implement triage protocols and order sets to standardize care to improve safety, and make ordering more efficient

- Intended Outcome: Recognize more patients who could be experiencing a Stroke and expedite tPA treatments of qualified patients, to a goal of > 11%

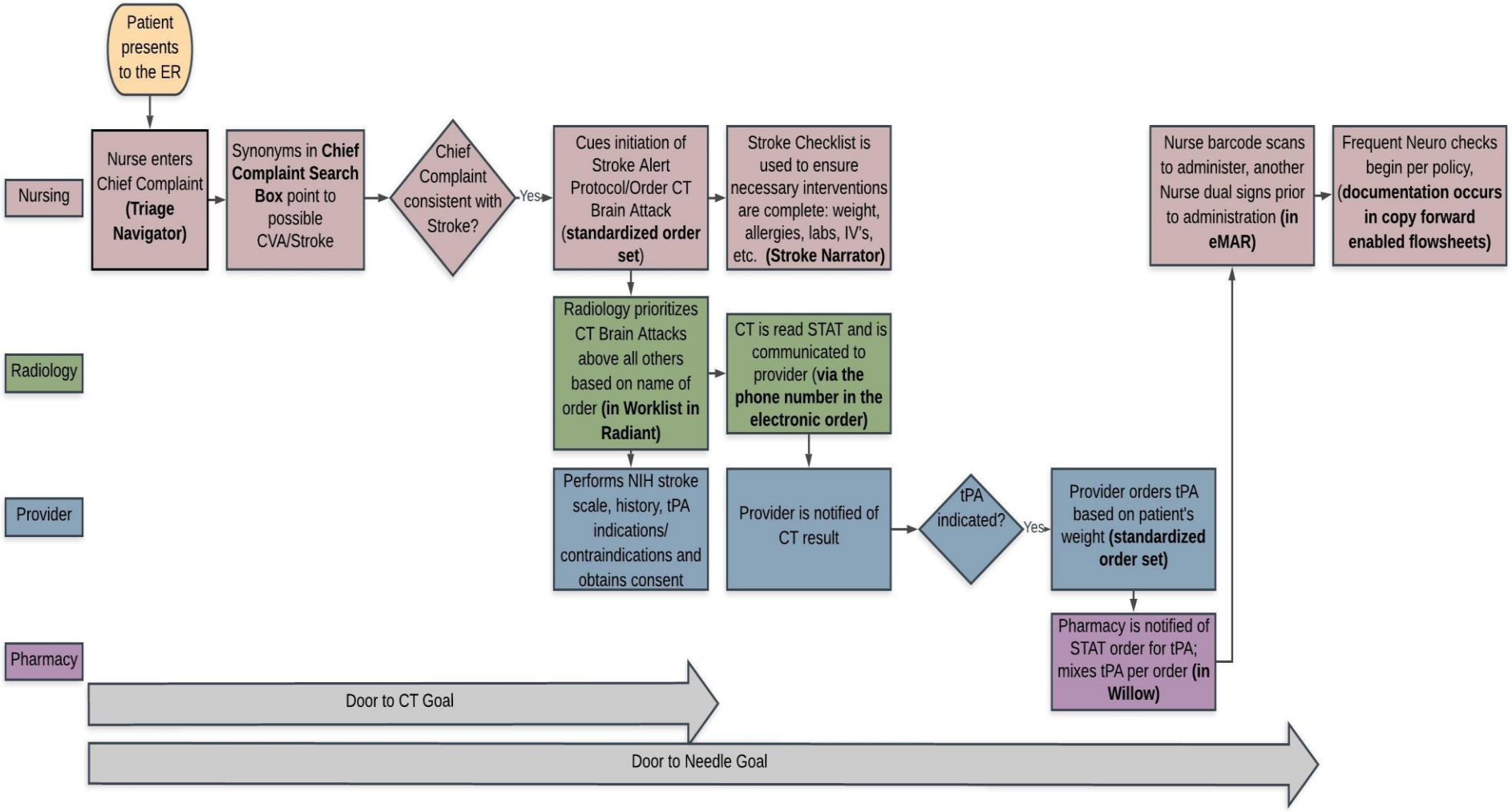
Design and Implementation

- Redesign processes, workflows to improve recognition and update protocols and order sets
- Focused on ED Provider and Nurse Education (including Mock Brain Attack Drills)
- Hospital-wide Stroke Education
  - Recognizing symptoms, initiating Brain Attack protocol, and following standard work
- Communication with Stroke Coordinator and Quality Team throughout the process

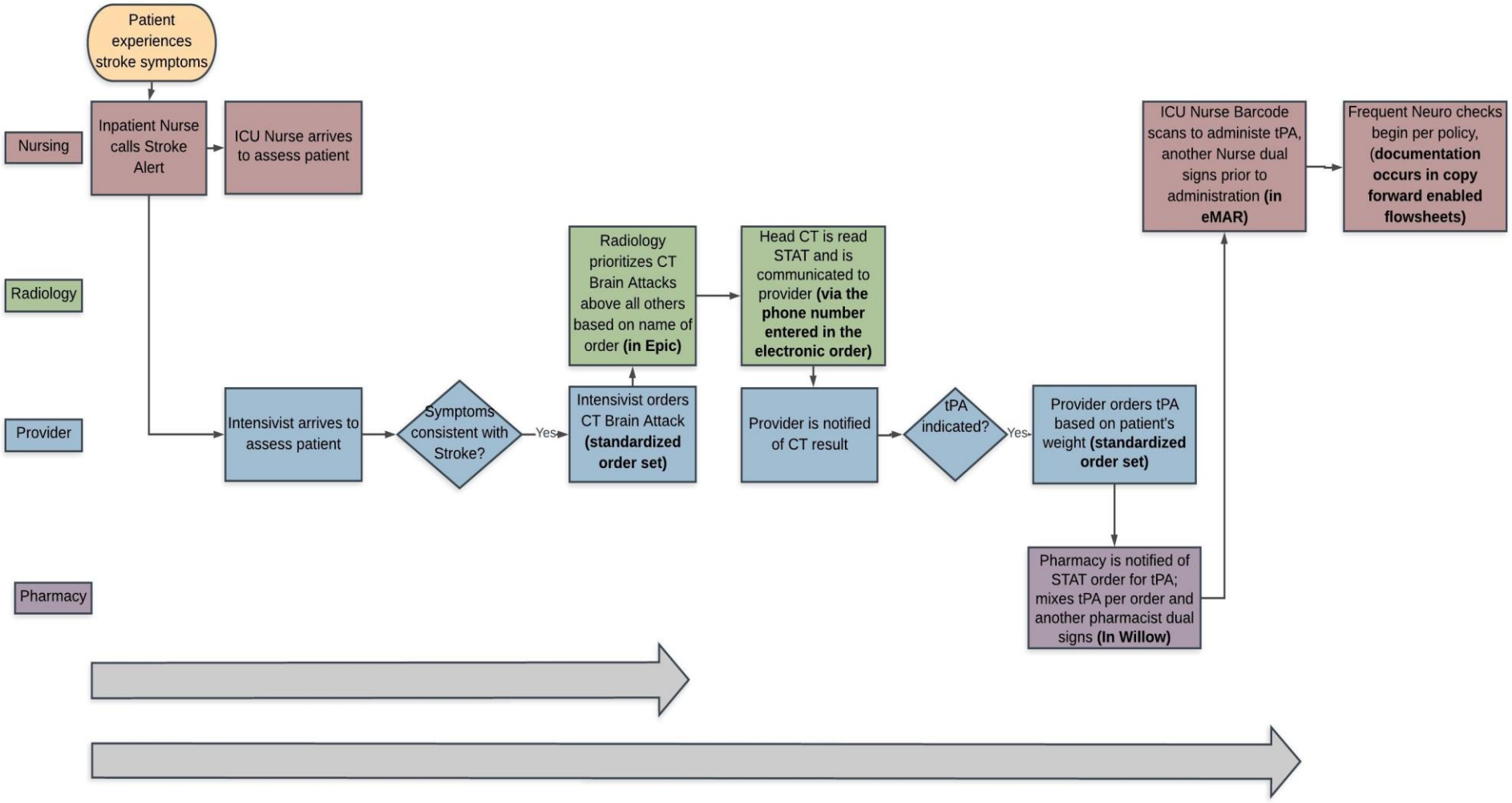
Workflow and How Health Information Technology is Utilized

How Health IT is Utilized:

Emergency Department Stroke Alert Workflow

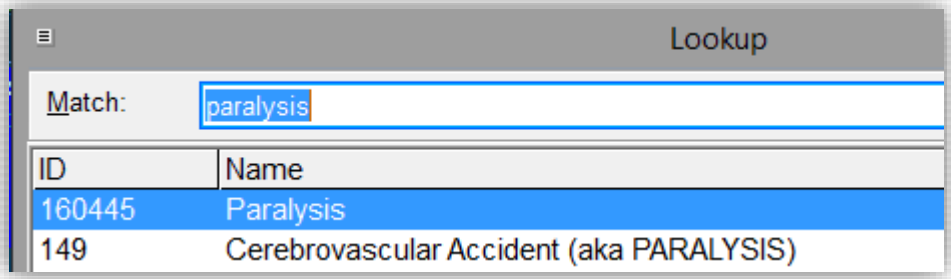


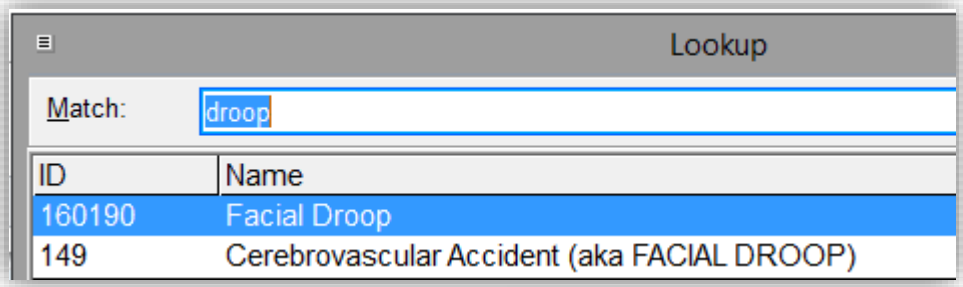
How Health IT is Utilized:
Inpatient Stroke Alert Workflow

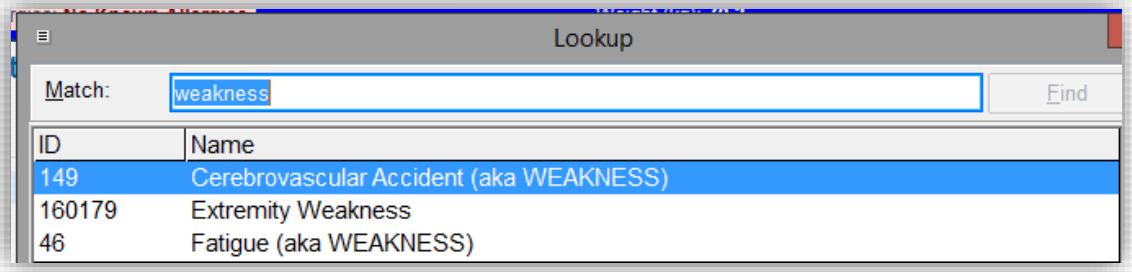


Target 1: Cast a Wider Net

- Use Epic to remind clinicians of the possible chief complaints that could potentially be a CVA/Stroke





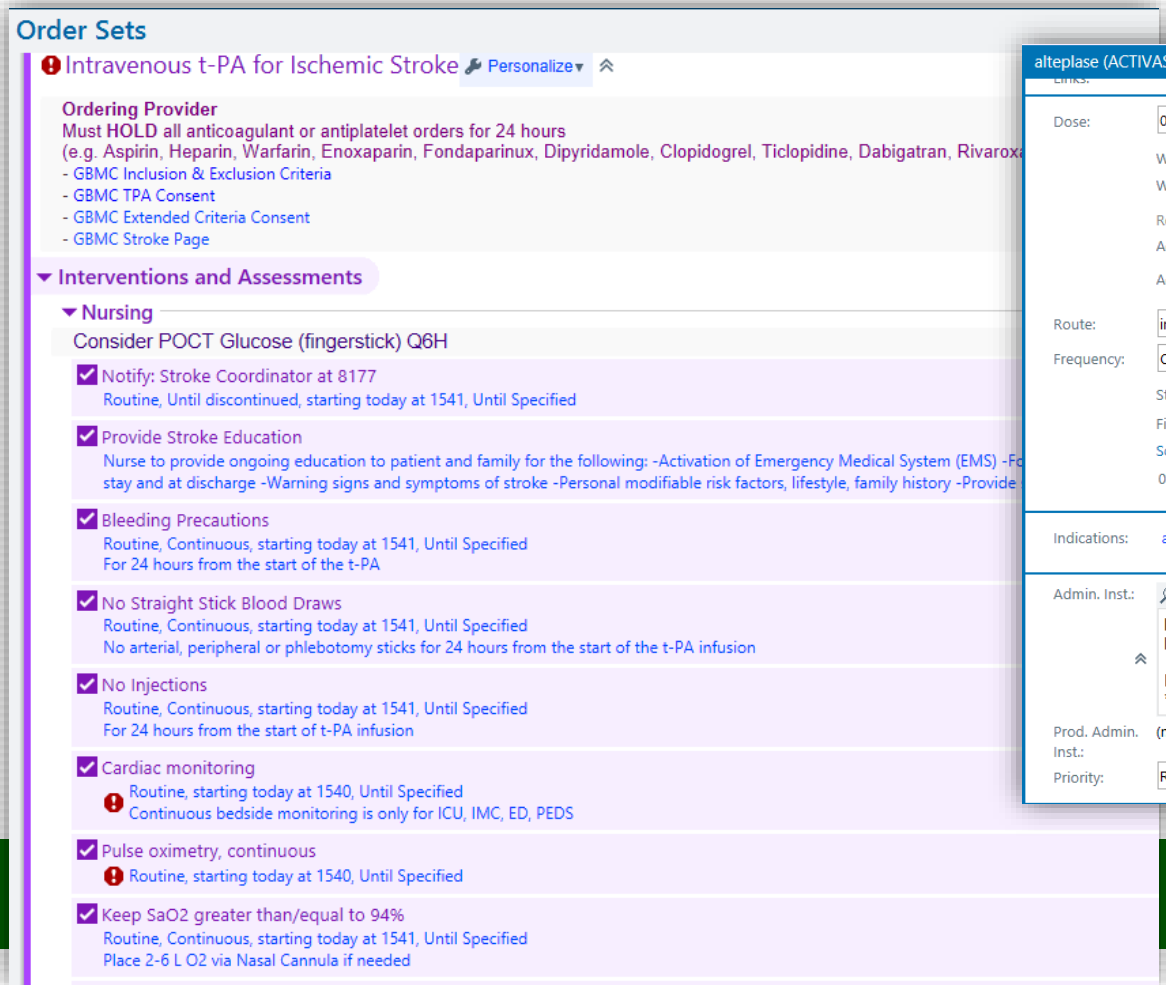


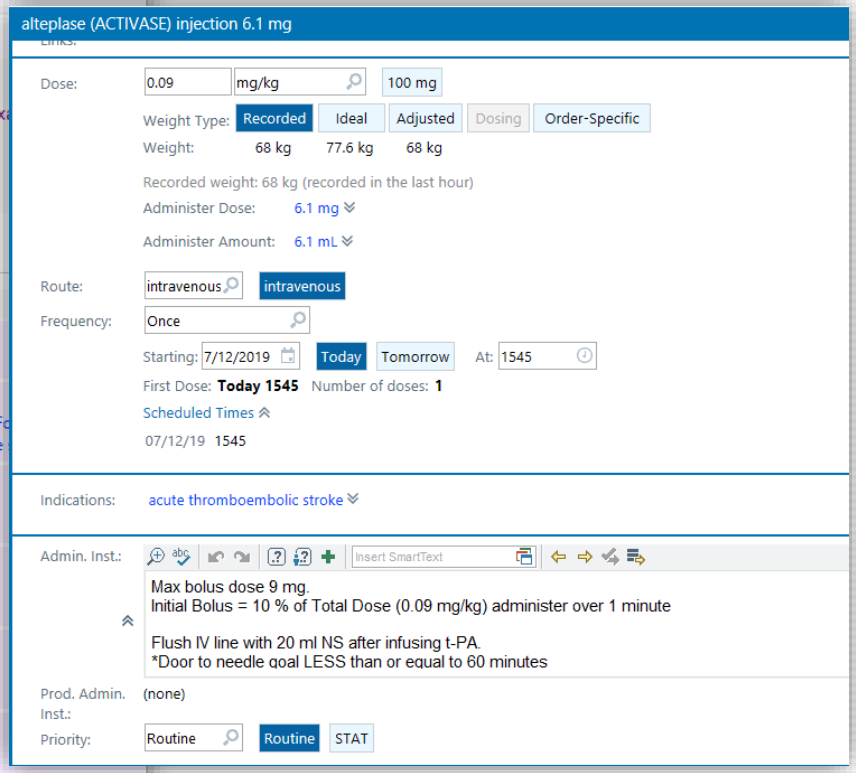
Target 2a: Nurse-Driven Triage Protocol

- Nurse-entered order set custom built for GBMC's needs
- Includes orders, all required assessments and interventions
  - CT Brain order
  - Neurologic status assessment
  - 2 peripheral IV's
  - POCT glucose
  - Lab work
  - Swallow Screenings

Target 2b: tPA Order Set

- Ensures care standardization, increases efficiency
- Improves safety of high risk medication dosing
  - tPA dose is calculated based on recorded weight
  - Pharmacy mixes the tPA per order





Success & Change Management Strategy for Workflow Improvements

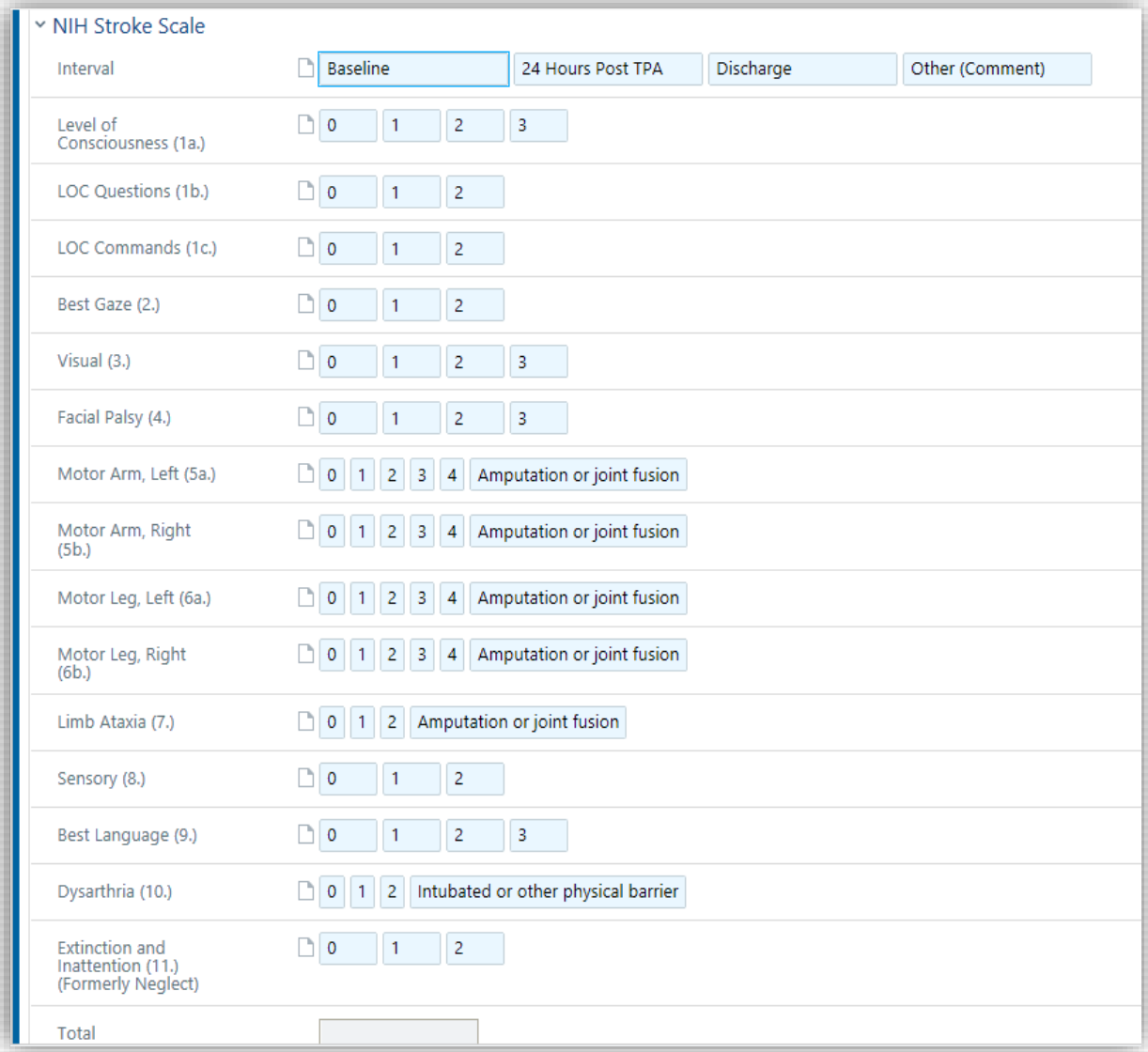
- Coordinated Stroke Task Force Meetings
  - Multidisciplinary representation including nurses and providers from ED, Stroke Units and Critical Care areas
- Data report out and analysis
- Review of all tPA cases for potential learning opportunities
- Acknowledgement of successes
- Conduct continuous performance improvement cycles with implementation of new enhancements

Other System Improvements

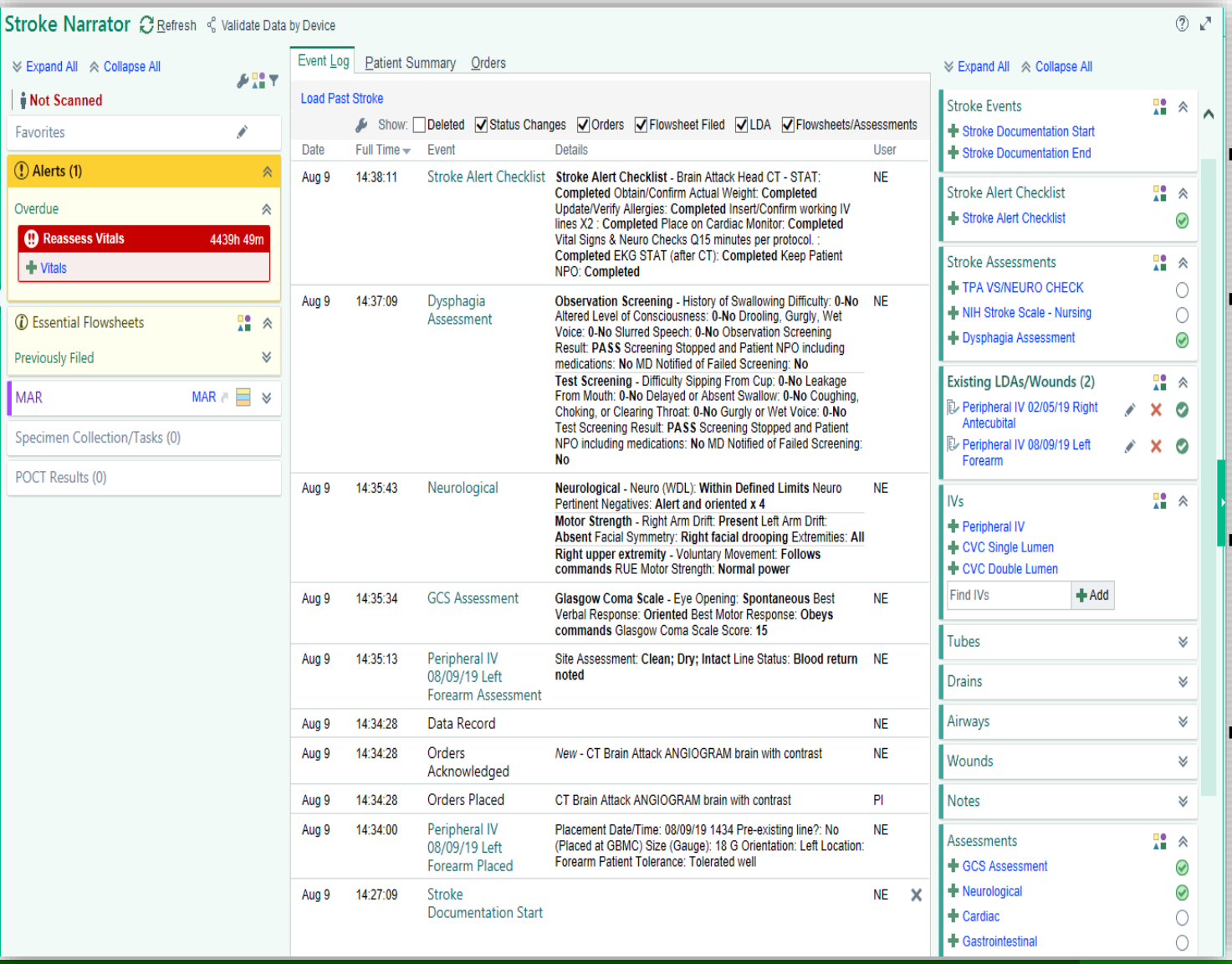
- NIH Stroke Scale incorporated into Epic
- Implementation of Stroke Narrator
- Nurse Stroke Checklist (coming soon)
- Los Angeles Motor Scale
- Neuro Check flowsheets have Copy Forward allowed

NIH Stroke Scale

- Performed at baseline, 24 hours post tPA, and at discharge
- All assessments visible for data trending



Stroke Narrator



- Customized build to increase efficiency
- All required assessments located here to increase compliance
- Combined Vitals and Neuro Checks since done together
- tPA can be administered from this screen

"To every patient, every time, we will provide the care that we would want for our own loved ones."

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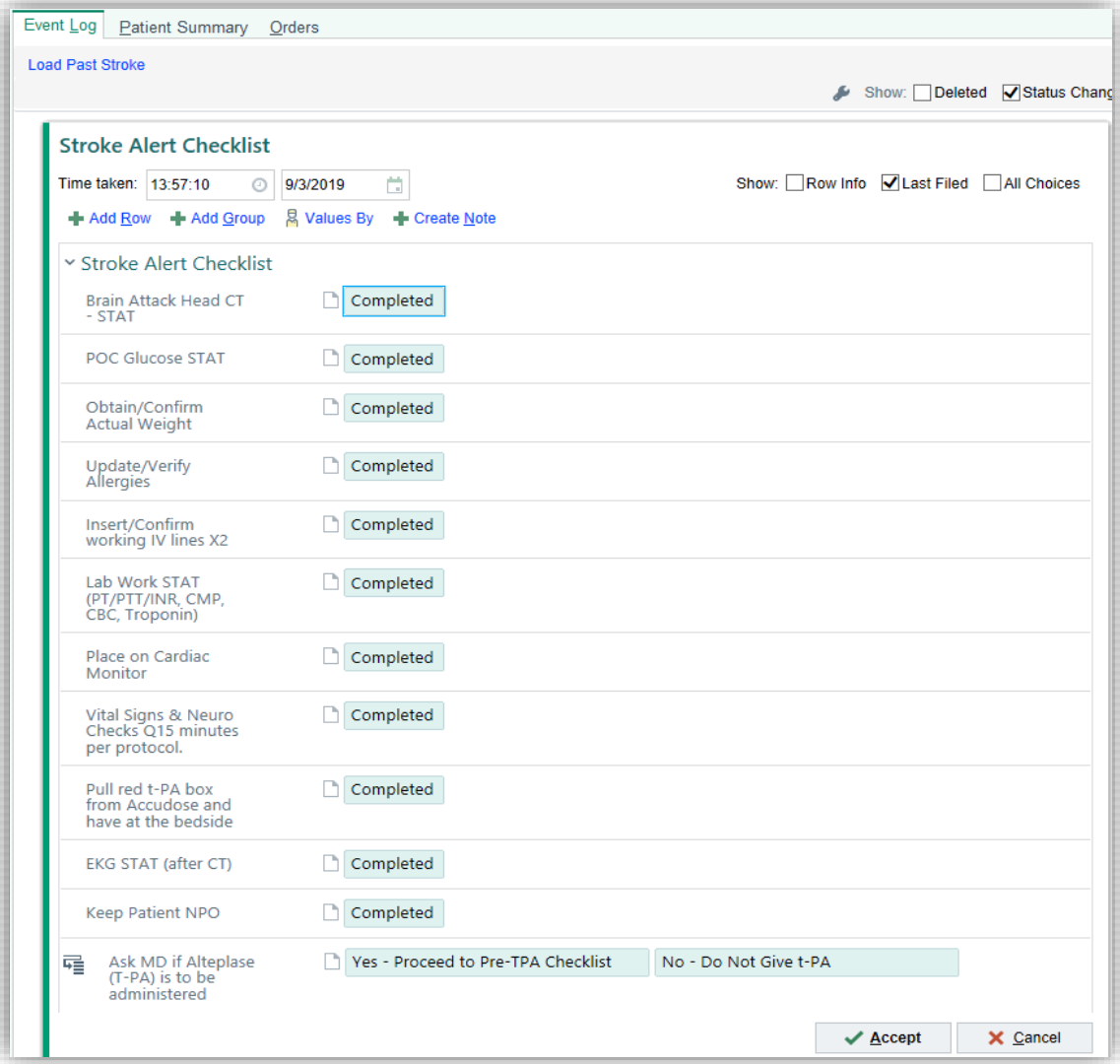
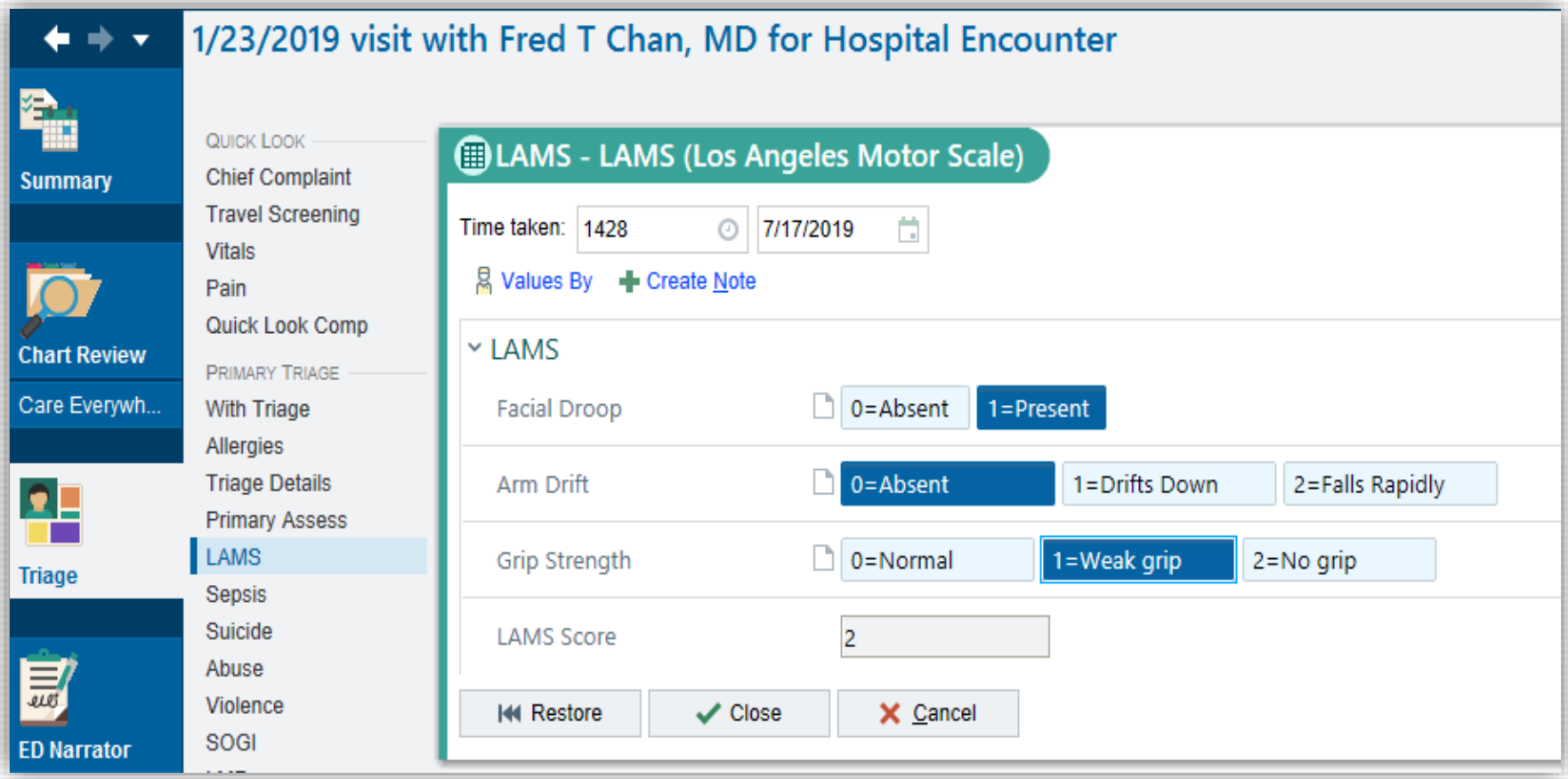
Nurse Stroke Alert Checklist

- Improves compliance with obtaining timely POC Glucose, weight, allergies, labs, etc.
- Paper form converted to electronic



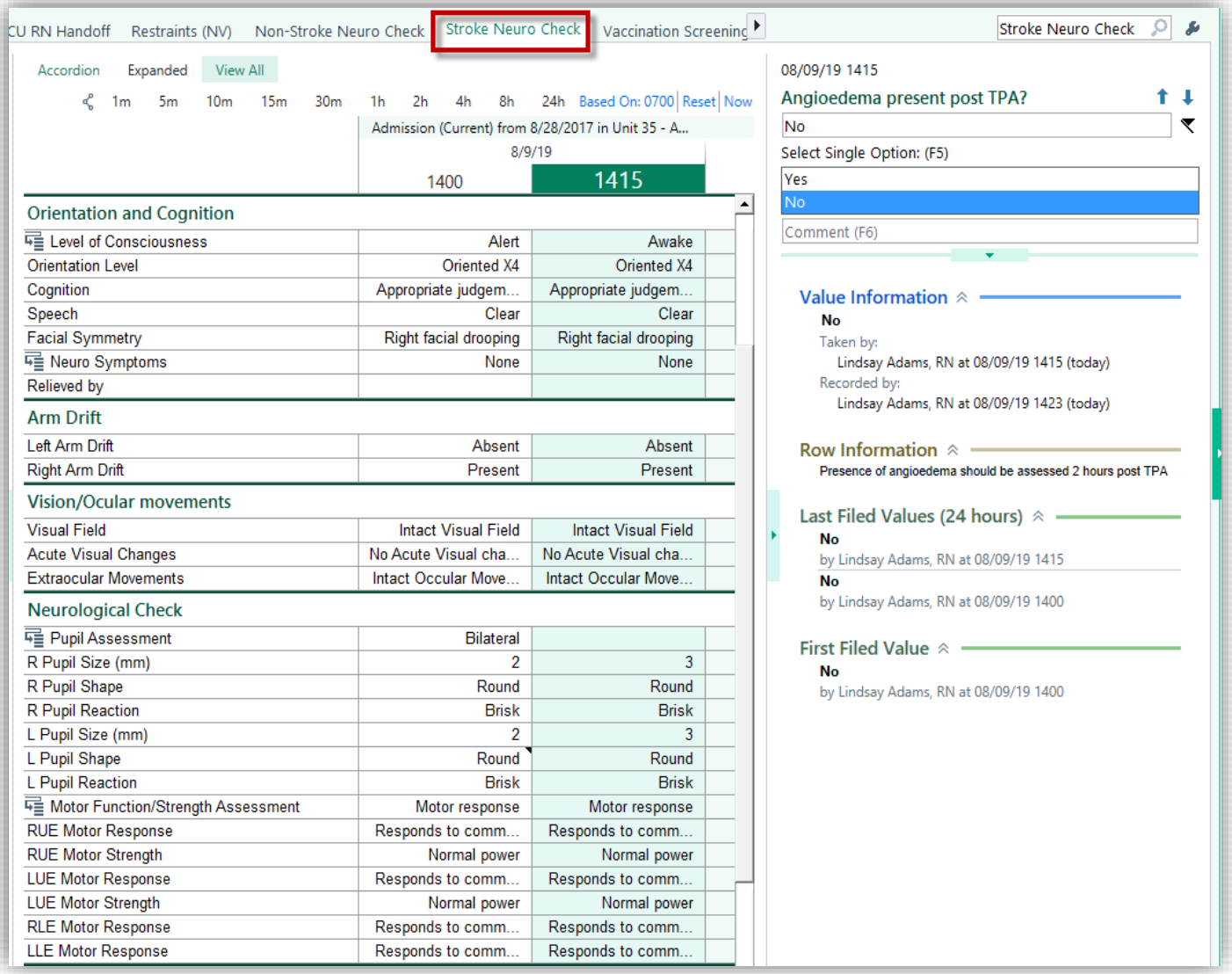
Los Angeles Motor Scale (LAMS)

- Assists triage nurses in the identification of acute cerebral ischemia because of large vessel occlusion

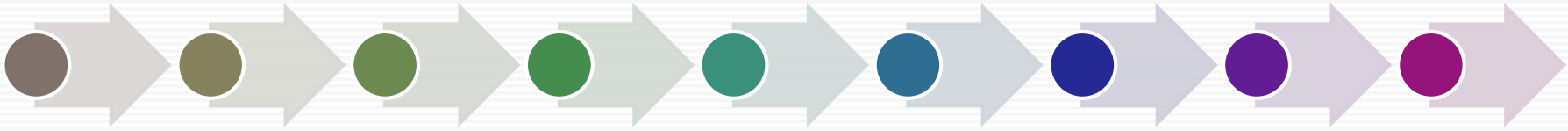


Neuro Checks: Copy Forward Allowed

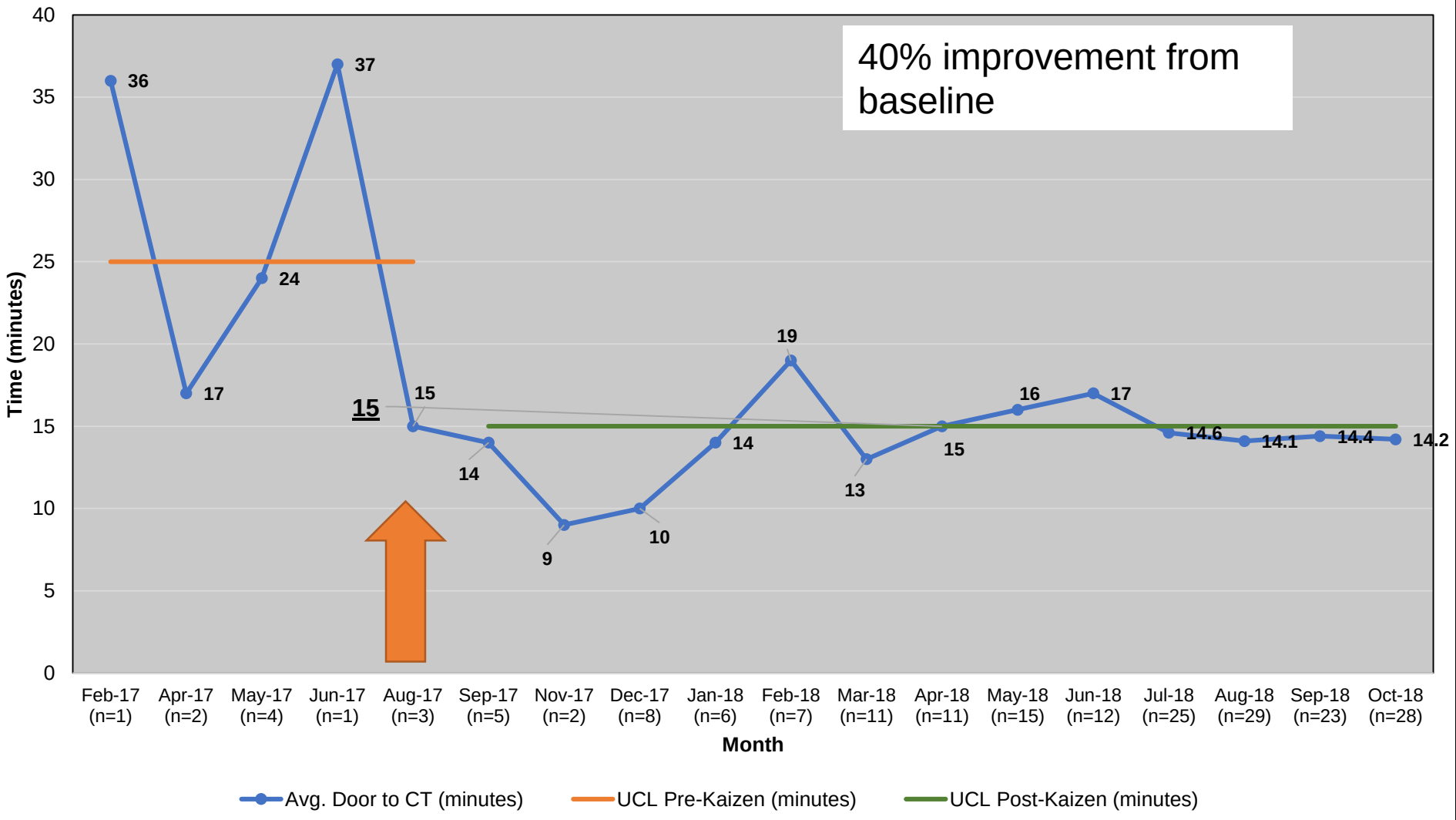
- Quickly/easily see changes in neuro assessments
- Supports efficient documentation of patient condition over time



Value Derived



Target 1 -ED Stroke Alert Door to CT Time (through October 21, 2018)
Improvement with Nurse-Driven Protocol



"To every patient, every time, we will provide the care that we would want for our own loved ones."

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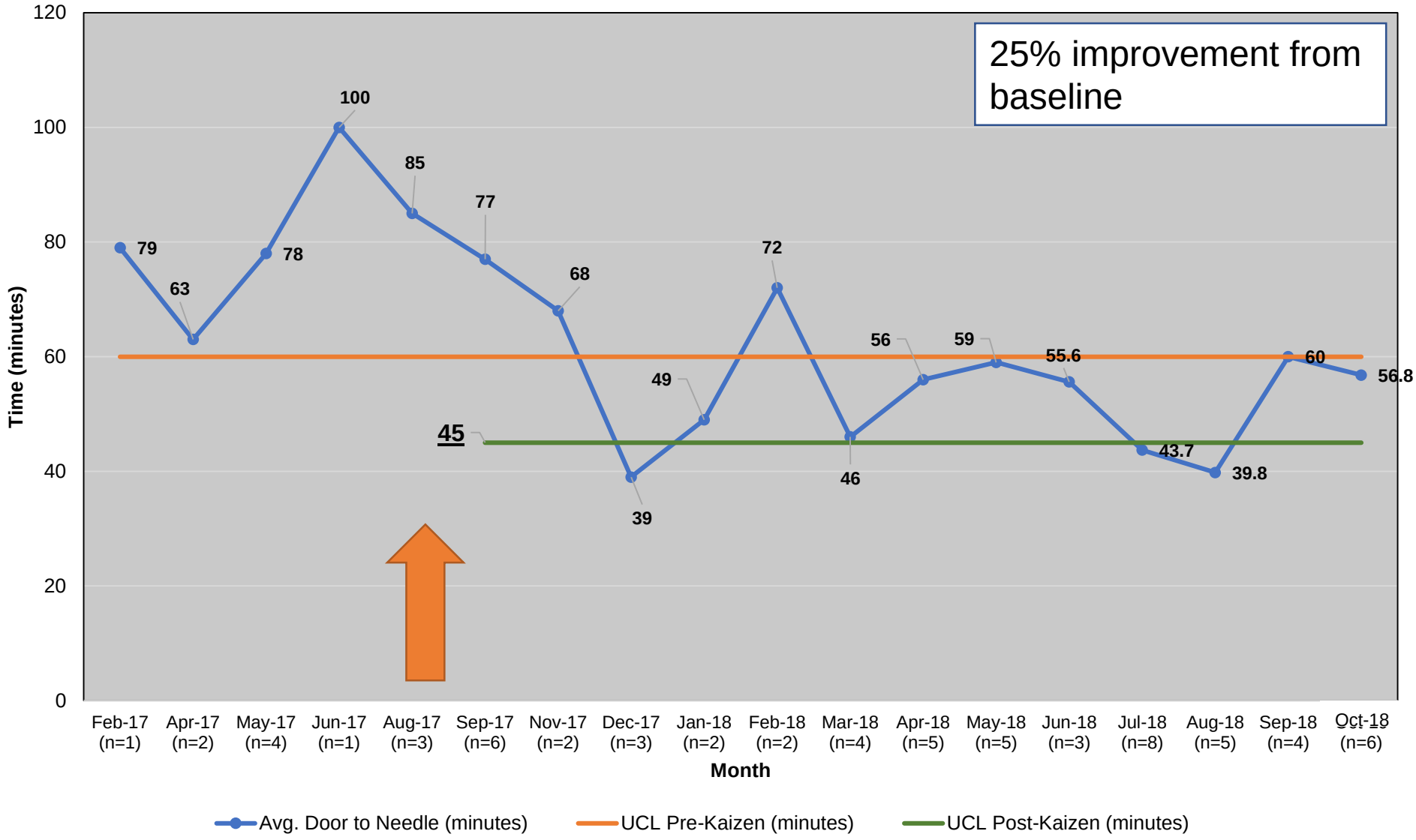
ED Stroke Alert Door to Needle Time (through October 21, 2018) Improvement with Provider Standardized Order Set Use



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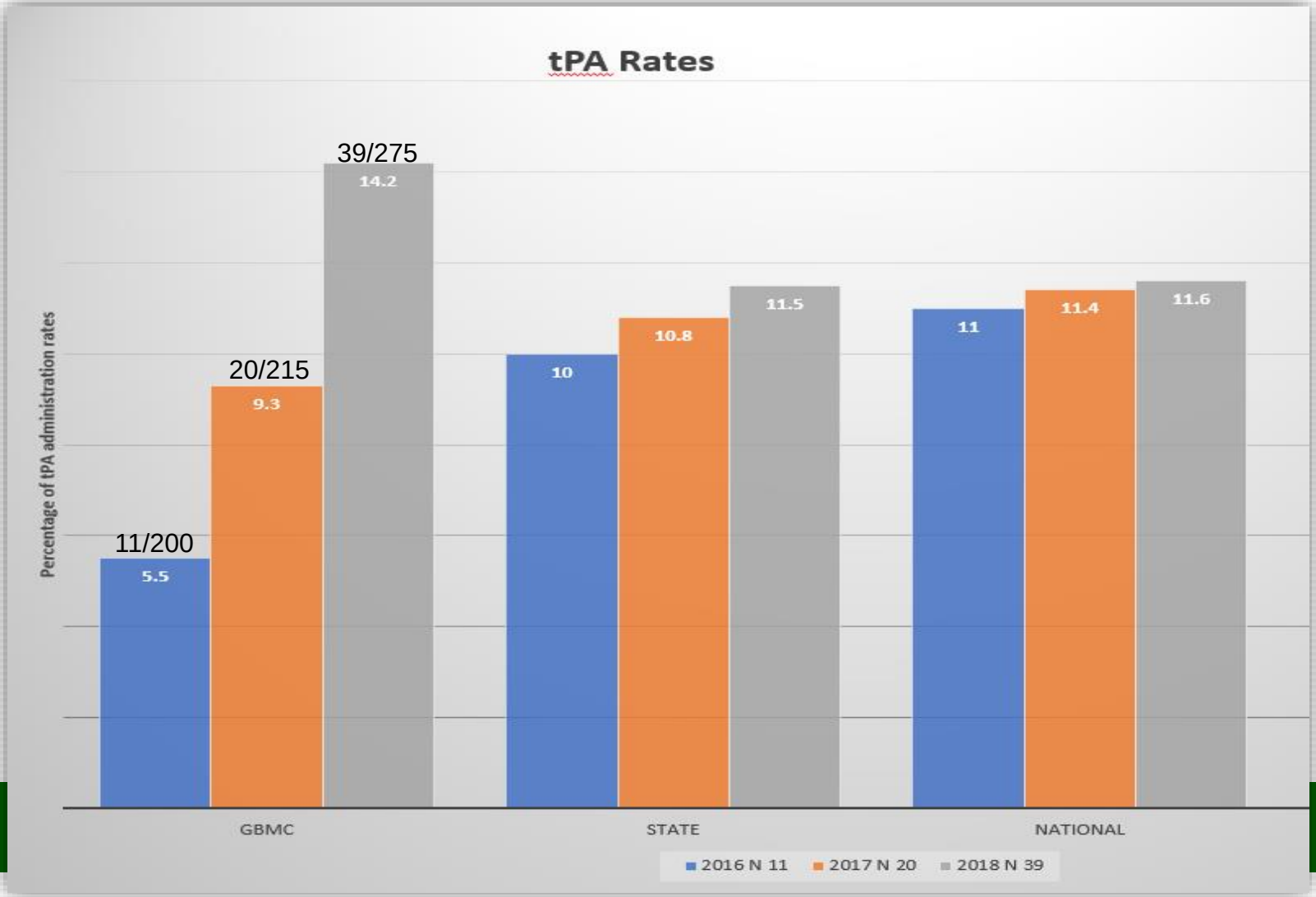
GBMC tPA Rates 2016, 2017, 2018

Compared to State and National Benchmarks

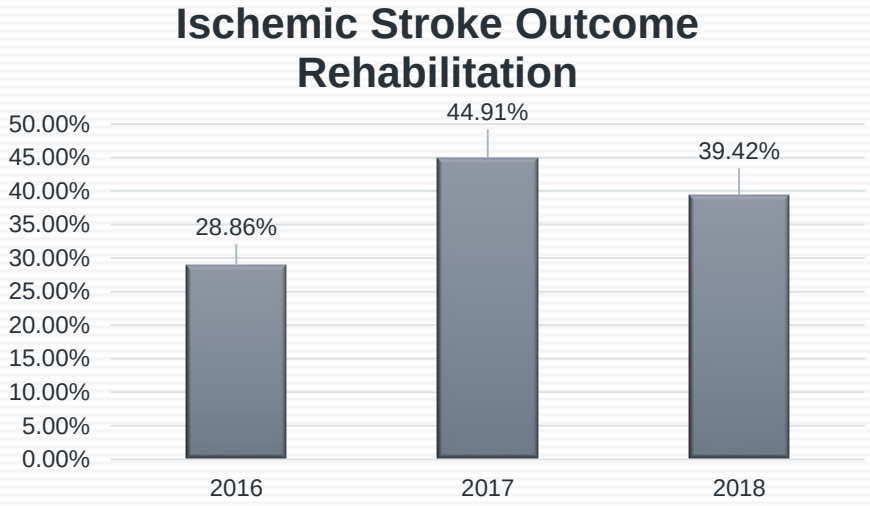
according to *Get With the Guidelines*

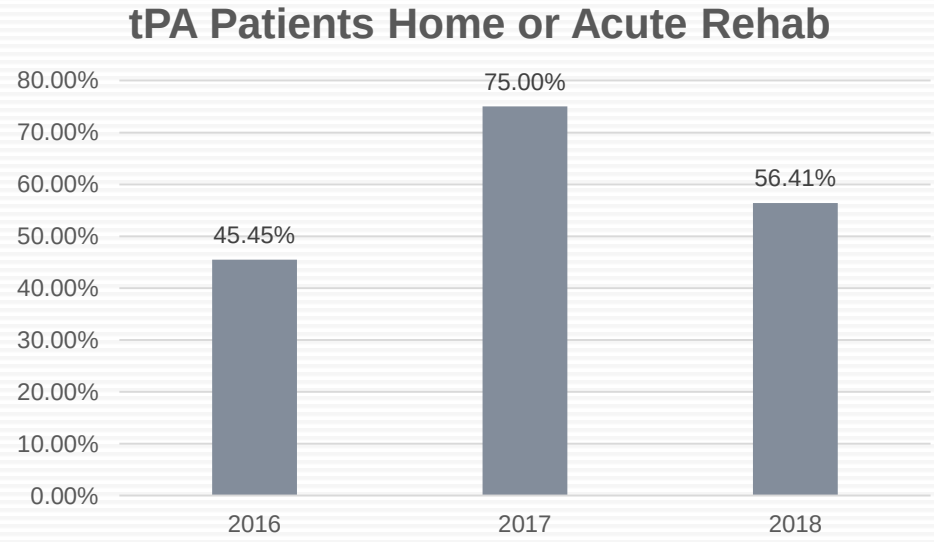


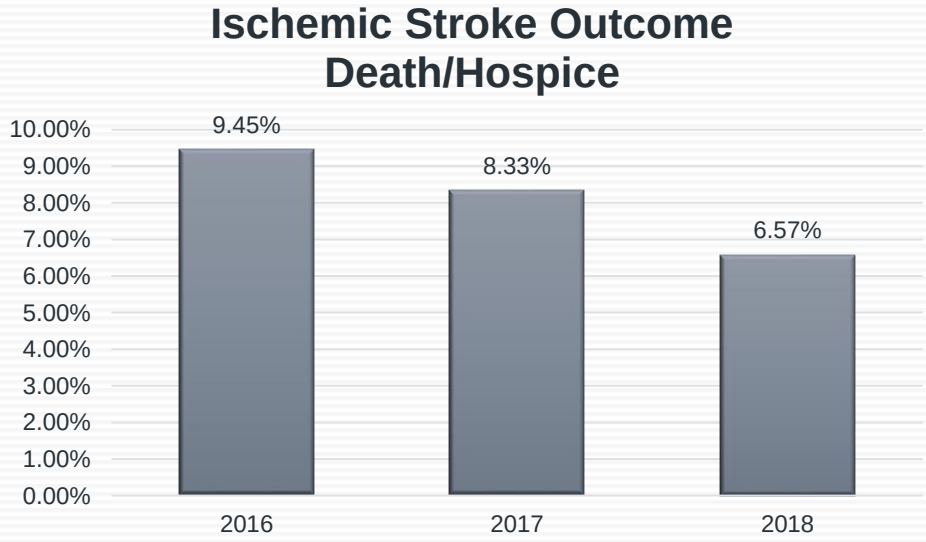
Lowered Mortality/Morbidity

After implementation of the new design for stroke treatment, more patients were discharged to home or acute rehab.

% of patients died or discharged to hospice also decreased.







Return on Investment

- Initial landmark study in Neurology has shown that qualified patients treated with tPA will produce health care cost savings of approximately $4,500 per patient[1]

- Using the estimation of $4,500 dollars cost savings per tPA treated patient:
  - 11 in 2016 = $49,500
  - 20 in 2017 = $90,000
  - 39 in 2018 = $175,500

1 https://www.ncbi.nlm.nih.gov/m/pubmed/9566367/ Cost Effectiveness of Tissue Plasminogen Activator for Acute Ischemic Stroke. Fagan SC, et al. Neurology. 1998.

Stroke Center Recognition

- Given by American Heart Association (AHA) in recognition of hospitals that meet specific quality measures for the diagnosis and treatment of stroke patients with the **goal of speeding recovery and reducing death and disability for stroke patients.**

Keys to Success

- Process must always be re-evaluated based on the data and changing workflows
  - Small workflow change can mean a big change in the data
  - Leverage PDSA and Epic
- Casting a wider net means:
  - Identify more stroke patients
    - Increases pharmacy expenses for tPA medication, which means budget planning
      - **Eventually pharmacy used the amount of medication wasted for central line de-clotting, contributing to savings of $1000**
  - More false alarms for possible strokes
- Essential that all members of the care team understand the high priority of a Stroke Alert