Case Study 1

Improving tPA Rates to Enhance Quality of Life for Stroke Patients

Presenters:

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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

“To every patient, every time, we will provide the care that we would want for our own loved ones.”
Baseline Data:
2016 tPA Administration Rates

- 5.5% GBMC Baseline tPA Administration Rate
- 10% State tPA Administration Rate
- 11% National tPA Administration Rate

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

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

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<td>Identification of waste</td>
<td>Implementation of process changes</td>
<td>Train associates on process changes</td>
<td>“Go-live” with new process</td>
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<td>Document current state map</td>
<td>Future state brainstorming of changes to eliminate waste</td>
<td>Document new work visuals, standards</td>
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<td>Observe and support associates in work area</td>
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<td>Document future state map</td>
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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

Patient presents to the ER

Nurse enters Chief Complaint Search Box pointing to possible CVA/Stroke

Chief Complaint consistent with Stroke?

Cues initiation of Stroke Alert Protocol/Order CT Brain Attack (standardized order set)

Stroke Checklist is used to ensure necessary interventions are complete: weight, allergies, labs, IV's, etc. (Stroke Narrator)

Radiology prioritizes CT Brain Attacks above all others based on name of order (in Worklist in Radiant)

CT is read STAT and is communicated to provider (via the phone number in the electronic order)

Performs NIH stroke scale, history, tPA indications/contraindications and obtains consent

Provider is notified of CT result

tPA indicated?

Provider orders tPA based on patient's weight (standardized order set)

Pharmacy is notified of STAT order for tPA; mixes tPA per order (in Willow)

Nurse barcode scans to administer, another Nurse dual signs prior to administration (in eMAR)

Frequent Neuro checks begin per policy, (documentation occurs in copy forward enabled flowsheets)

Door to CT Goal

Door to Needle Goal

“To every patient, every time, we will provide the care that we would want for our own loved ones.”
How Health IT is Utilized: Inpatient Stroke Alert Workflow

Patient experiences stroke symptoms

Nursing

Inpatient Nurse calls Stroke Alert

ICU Nurse arrives to assess patient

Radiology

Intensivist arrives to assess patient

Symptoms consistent with Stroke?

Provider

Intensivist orders CT Brain Attack (standardized order set)

Pharmacy

Head CT is read STAT and is communicated to provider (via the phone number entered in the electronic order)

Provider is notified of CT result

IPA indicated?

Provider orders IPA based on patient's weight (standardized order set)

Pharmacy is notified of STAT order for tPA; mixes tPA per order and another pharmacist dual signs (In Willow)

ICU Nurse Barcode scans to administe IPA, another Nurse dual signs prior to administration (In eMAR)

Frequent Neuro checks begin per policy, (documentation occurs in copy forward enabled flowsheets)

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

GBMC
Target 1: Cast a Wider Net

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

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

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

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Order Sets

**Intravenous t-PA for Ischemic Stroke**

- **Ordering Provider**
  - Most HOLD all anticoagulant or antiplatelet orders for 24 hours
    - e.g., Aspirin, Heparin, Warfarin, Enoxaparin, Fondaparinux, Dipyridamole, Clopidogrel, Ticlopidine, Dabigatran, Rivaroxaban
  - GBMC Inclusion & Exclusion Criteria
  - GBMC tPA Consent
  - GBMC Extended Criteria Consent
  - GBMC Stroke Page

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Interventions and Assessments

**Nursing**

- **Consider POCT Glucose (fingerstick) QGH**
  - Notify: Stroke Coordinator at 8177
  - Routine, Until discontinued, starting today at 1541, Until Specified

- **Provide Stroke Education**
  - Nurse to provide ongoing education to patient and family for the following: -Activation of Emergency Medical System (EMS) -For stay and at discharge -Warning signs and symptoms of stroke -Personal modifiable risk factors, lifestyle, family history -Provide discharge instructions

- **Bleeding Precautions**
  - Routine, Continuous, starting today at 1541, Until Specified
  - For 24 hours from the start of the t-PA

- **No Straight Stick Blood Draws**
  - Routine, Continuous, starting today at 1541, Until Specified
  - No arterial, peripheral or phlebotomy sticks for 24 hours from the start of the t-PA infusion

- **No Injections**
  - Routine, Continuous, starting today at 1541, Until Specified
  - For 24 hours from the start of t-PA infusion

- **Cardiac monitoring**
  - Routine, starting today at 1540, Until Specified
  - Continuous bedside monitoring is only for ICU, IMC, ED, PEDS

- **Pulse oximetry, continuous**
  - Routine, starting today at 1540, Until Specified

- **Keep SgO2 greater than/equal to 94%**
  - Routine, Continuous, starting today at 1541, Until Specified
  - Place 2-6 L O2 via Nasal Cannula if needed

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**alteplase (ACTIVASE) injection 6.1 mg**

- **Dose**: 0.09 mg/kg
- **Admin Amount**: 6.1 mL
- **Route**: Intravenous
- **Frequency**: Once
- **Starting**: 7/12/2019
- **Dosing**
  - Max bolus dose: 9 mg
  - Initial Bolus = 10% of Total Dose (0.60 mg/kg) administer over 1 minute
  - Flush IV line with 20 ml NS after infusing t-PA
  - *Door to needle goal LESS than or equal to 60 minutes

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GBMC
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

“To every patient, every time, we will provide the care that we would want for our own loved ones.”
NIH Stroke Scale

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

“To every patient, every time, we will provide the care that we would want for our own loved ones.”
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.”
Nurse Stroke Alert Checklist

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

“\textit{To every patient, every time, we will provide the care that we would want for our own loved ones.”}
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

“To every patient, every time, we will provide the care that we would want for our own loved ones.”
Target 1 - ED Stroke Alert Door to CT Time (through October 21, 2018)

Improvement with Nurse-Driven Protocol

40% improvement from baseline

Avg. Door to CT (minutes)
UCL Pre-Kaizen (minutes)
UCL Post-Kaizen (minutes)

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

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

25% improvement from baseline

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

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


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