LIFE IN THE FAST LANE: STRATEGIES TO DECREASE DOOR TO NEEDLE TIME IN ACUTE STROKE

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Swedish Medical Center
• Located in the Denver Metro
• Southwest Quadrant of Denver
• City of Englewood
• 368 Bed Acute Care Hospital
• 60,000 ED Visits Annually
• Joint Commission
Comprehensive Stroke Center
• >1200 Stroke Patients Annually
• Level 1 Trauma Center
• 42 Critical Care Beds
• Dedicated Neuro Critical Care Unit
• Swedish Neuroscience Hospital
• Currently under construction

Swedish Stroke Program: History
• Dedicated to Stroke Since 2002
• Certified Primary Stroke Center
• First PSC in Colorado in 2004
• Certified Comprehensive Stroke Center
• Survey in December 2012
• Certified January 2013
• First in the Rocky Mountain Region
• ASA Gold Plus Award for Stroke
• Target Stroke Elite Plus 2015

Comprehensive Stroke Alert Team
• Physician Team
  • 9 Board-Certified Inpatient Neurologists
  • Blue Sky Neurosciences
  • 24/7 Coverage
  • Median Door to Neurology Time at Bedside is 0 minutes
• APN Stroke Coordinator Team
  • 5 Advanced Practice Nurses
  • 2 Adult CNS’s
  • 1 ACNP
  • 8-5pm, 7 Days a Week
• ED Team
  • ED Physician
  • ED Nurse
  • ED Tech
  • Secondary RN and Tech if available

This is Our Story:
IV tPA Cases at Swedish

This is Our Story:
Median Door to Needle Time at Swedish
Making The Case For Faster DTN Times

Focus On Each Minute
1.9 million neurons
14 billion synapses

Making the Case for Faster DTN Times

Making the Case for Even Faster DTN Times
Target Stroke
- Launched in January 2010
- Goal: Increased the proportion of Stroke Patients Treated with a DTN Time < or = 60 Minutes
- 71,169 Stroke Patients Treated with IV tPA
- From 1,030 GWTG-Stroke Participating Hospitals
- 27,319 Patients Were From 2003-2009 (Pre-Intervention)
- 43,850 Patients Were From 2010-2013

Presented at ISC 2014, San Diego, CA
Five Domains of Early IV tPA Administration at Swedish

- Communication and Teamwork
  - Formal Meetings and Document Development
  - Electronic and In-Person Discussion of New Processes with Stakeholders
- Process
  - Standards of Practice Guidelines
- Organizational Culture
  - Supportive of Stroke Program and Process Change
- Performance Monitoring and Feedback
  - Sharing Success with the Team
  - Data Tracking and Evaluation
- Overcoming Barriers
  - Working with Many Department to Achieve Goals

How Did We Achieve A 25 Minute Median Door To Needle Time?

Lean Concept

- Lean Concept
  - Value from customers perspective
  - Identify the value steps for the process
  - Eliminate non-value added Steps
  - Make the flow uninterrupted
  - Continue to rework until state of perfection is achieved

Lean in Health Care

- Drive out waste so all work adds value and serves customers needs
- Identify value added vs. non value added steps
- Must identify every step in a process
- Lean is not cost containment
- Only sustainable process in one team believes in
  - Institute For Health Care Improvement
  - Going Lean in Health Care 2005

Acute Ischemic Stroke Treatment: 2002

- Patient Has a Stroke
- May or May Not Call 911
- EMS Arrival
- Check Patient and Glucose On-Scene
- EMS Transport to Hospital
- Often “Non Emergent”
- Enter Room
- Transfer to ED bed
- RN Takes Report
- Registration
- ED Doc Sees Sometime Later
- Put in Line for CT
- Sent to CT
- Often Wait for CR result
- Patient returns from CT
- CT Read by Radiologist
- CT Report Reviewed by ED doc
- ED Doc Pages Neurologist
- Neurologist Calls Back
- History Reviewed
- Decision to Administer tPA
- Patient Weight Obtained
  - Or Estimated
- Pharmacy Called
- Drug Mixed
- Drug Delivered to Bedside
- Drug Administered?

Swedish Stroke Program Created

- Began in 2003
- Processes remained linear
- Initial goal was to simply treat the acute stroke patient within the 3-hour window
2004 Stroke Program Initial Steps
Addition of “Stroke Alert” Process
• Modeled after successful Cardiac Alert program
• We learned that pre-arrival notification from EMS was key to improving process times
• Partnership and education with area EMS agencies
• First hospital in Colorado to recognize “stroke alert”
• 70% of first 100 Stroke Alerts were having a Stroke or TIA

Swedish Stroke Program 2006: Next Steps
• Initial stroke program not consistently staffed by Stroke Neurologists
• 24/7 Emergency Neurology coverage with dedicated stroke physicians 2007
• Neuro Hospitalists

2006 – 2012 Building A Referral Network
• Continued to fine tune our process
• Large increase in stroke cases
• Focused on outreach and building a larger referral network
• However DTN times for our own EMS patients plateaued

Making the Case for Faster DTN Times
• EMS Involvement
• Hospital Pre-notification
• Preorder of Test
• No-Delay CT Interpretation
• Premixing of tPA
• Delivery of tPA on the CT Table
• CT Relocated to ER
• CT Priority and CT Transfer
• Rapid Neurologic Evaluation
• Pre-Acquisition of History
• Point of Care INR
• Reduced Imaging

CT Direct Protocol:
Focus on Eliminating Wasted Time
• Process of EMS patients moving into an ED room and transferring to an ED bed is inherently wasteful
• Simply moving onto the ED stretcher and onto the ED monitor takes time
• Rooms differ in proximity to CT scan

Why Does The Patient Enter A Room Prior To Ct Scan?
• Process of EMS patients moving into an ED room and transferring to an ED bed is inherently wasteful
• Simply moving onto the ED stretcher and onto the ED monitor takes time
• Rooms differ in proximity to CT scan
2013 CT Direct Protocol

- ED Leadership Driven Process
- EMS Keeps Patient on Stretcher and Transports Patient to CT
- Fully Supported by Stroke Team
- Stakeholder Buy-In Obtained
- EMS
- Physicians
- Nurses
- ED Techs
- CT Techs
- Trial Period Initially
- Evaluation
- Process Change

Launch Pad

- Entering the ED Room is Waste
- We created a Stroke Launch Pad
- Directly between EMS entrance and CT
- Identified position of Neurologist and ED physician
- Script what part of exam are needed prior to CT scan
- Adjacent to registration printer
- Launch Pad Processes Occur Simultaneously
  - Clerk: Rapid registration
  - ED Physician: Assess CAB’s
  - Neurologist/APN: Brief assessment, IRA eligibility, order IRA
  - RN: VS, IV access
  - ED Tech: Weigh patient, IV access

Swedish Stroke Launch Pad

CT Direct Protocol: Avoiding Stop in ED Room
Saved 5 Minutes on DTN times

2014 Door-to-Needle Task Force

- DTN Meeting Early 2014
  - ED Medical Director
  - Stroke Medical Director
  - Stroke Coordinators
  - Pharmacists
  - Discuss IRA Admin in CT
  - Dedicated IRA Pump for IRA administration
  - Keep at the launch pad
  - IV IRA only
  - Call for IRA to be Mixed Prior to Transport to CT

- Use ED Weigh Bed at Launch Pad When Available for IV IRA Candidates
- IV Pump to Accompany Launch Pad Cart to CT
- Back-up IV Pump in CT
- IRA Dosing Chart in CT
- Complete IRA Time-Out Prior to Drug
- Start Date: April 1, 2014

2014 Time to Rethink: Can We Get Leaner?
Roll-Out to Clinical Staff

- Formal Communication
  - ED Physicians/Nurses/Techs
  - ED Nurse/Tech Champions started to emerge
- Neurologists
- Most On-Board
- All willing to participate
- CT Tech Staff
- Would this new process cause CT delays?
- Pharmacists
  - Is this safe?
  - Can we mix the drug faster?

What About Safety?

**tPA Time-Out and Other Safety Issues**

- Symptomatic ICH rate <1%
- Requirements to give tPA in CT
- Neurologist present
- RN, MD both must be comfortable with the plan to treat in CT
  - If not, return to ED room

Standard of Practice Guideline

Mock Stroke Alert the Morning of “Go-Live”

- 0800 Mock Stroke Alert
  - Participants
    - “Patient”
    - AirLife Ground Transport Team
    - Neurologist
    - Stroke Coordinator
    - ED Physician/Nurse/Tech
    - CT Techs
    - Pharmacy
  - Process
    - Used Bed Scale
    - Took approx. 1.5 minutes
    - Called for tPA at Launch Pad
    - To CT
    - Waited in hallway for approx. 2-3 minutes
    - tPA arrived at 12 min
    - tPA Timeout performed
    - Mock DTN 14 minutes

Performance Feedback

2014 DTN 32 Minutes

Still more work to do!
2015
- Hardwiring Processes
- Goal DTN < 30 minutes (Best < 20 minutes)
- Fastest DTN 11 minutes
- Stroke alert called from the field by EMS
- Pre-hospital Education and Collaboration
- Staff Buy-in
  - Leadership discusses fast DTN times with prospective ED RN candidates prior to hire
- Team Buy-in
  - Neurologist at the Launch Pad directly tied to fast DTN times

**Swedish Medical Center: DTN Times**

**Getting Even Faster: Mobile Mixing of tPA**
- DTN Task Force
  - Revisited August 2015
- Focus on mixing IV tPA at the bedside by Pharmacist
- Creation of tPA tackle box
- Pharmacist coverage 0800-2130 M-F
- Usual process after hours
  - RN’s will not have access to the tackle box
- Mock stroke alerts are planned
- Impact TBD

**Mission Possible!**
2015 YTD DTN 25 Minutes

**What are the risks of getting too lean?**
- Missing a Contraindication for IV tPA
- Near Miss Case Solidified Need for Time-Out Process
- Will Symptomatic ICH’s Increase?
  - Not at Present Time
- Wasting of tPA
  - Watch Number of Returns/Not Used
  - Discuss Each Case in Neuro Peer Review
- Will Faster Treatment Lead to Better Outcomes?
Where can waste be eliminated in your stroke alert process?

Questions?
Thank You!
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References