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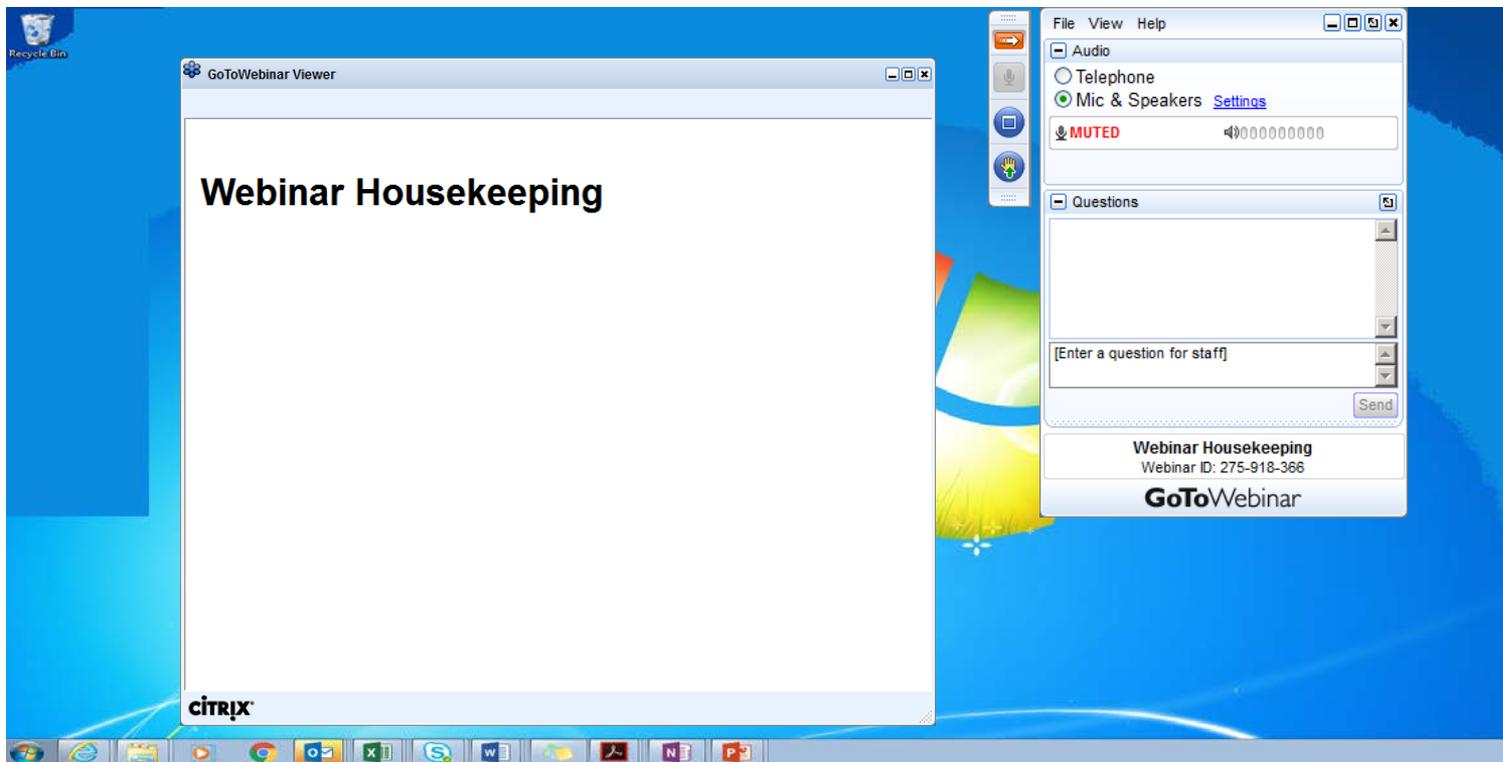
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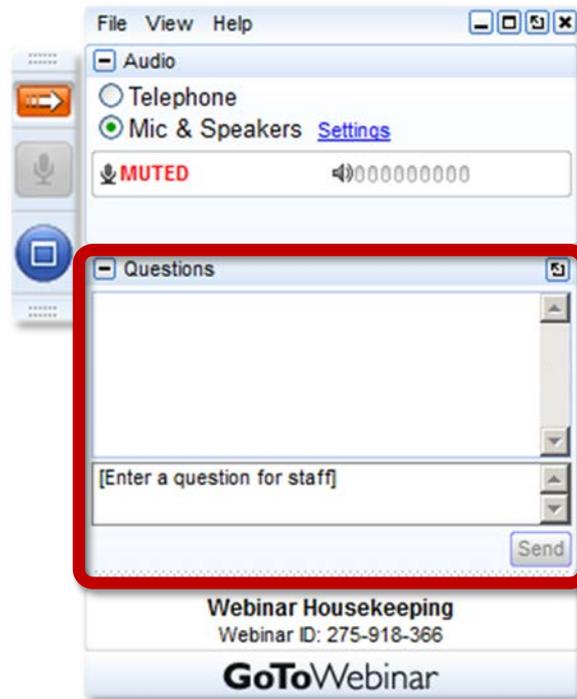
Endovascular Therapy: Deep Dive into the New Metrics & Recent Updates to the Patient Management Tool

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August 16, 2017

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Presenter Disclosure Information:

L.H. Schwamm: Clinical trials consultant to Medtronic (Steering Committee VICTORY AF, REACT AF; Co-PI Stroke AF). DSMB member for Novo-Nordisk DeVOTE trial, Penumbra Separator 3D trial. Executive Vice Chairman, Department of Neurology at Harvard Medical School. Chair, Stroke Clinical Workgroup AHA GWTG [®] - Stroke

J. Saver: Clinical trial design and conduct consultant to: Medtronic, Stryker, Neuravia, Boehringer Ingelheim (prevention only); Employee of the University of California, which holds a patent on coil retriever devices for stroke. Member, Stroke Clinical Workgroup AHA GWTG[®] - Stroke

Objectives:

By the end of the presentation, you will be able to:

- Understand the rationale behind the Endovascular Therapy (EVT) metrics

- Recognize when a patient is included or excluded from the EVT measure(s)

- Differentiate between the Get With the Guidelines® and The Joint Commission measures for thrombectomy

- Explain the recent changes made in the Patient Management Tool (PMT)

Background

Endovascular Recommendations for Eligibility:

1. Patients eligible for intravenous r-tPA should receive intravenous r-tPA even if endovascular treatments are being considered *(Class I; Level of Evidence B-R)*

2. Patients should receive endovascular therapy with a stent retriever if they meet the following criteria *(Class I; Level of Evidence A)*
   a. Pre-stroke mRS score 0 to 1
   b. Acute ischemic stroke receiving intravenous r-tPA within 4.5 hours of onset according to guidelines from professional medical societies
   c. Causative occlusion of the ICA or proximal MCA (M1)
   d. Age ≥18 yearC
   e. NIHSS score of ≥ 6
   f. ASPECTS of ≥ 6
   g. Treatment can be initiated (groin puncture)within 6 hours of symptom onset

3. Treatment of patients ineligible for IV r-tPA, but meeting other criteria above, with endovascular therapy with stent retrievers is reasonable *(Class IIa; Level of Evidence C)*

New Measures:
Endovascular Therapy (EVT)

EVT Measure Set:

#	Measure Name	TJC CSTK	GWTG® - Stroke
1	Mechanical Endovascular Reperfusion Therapy for Eligible Patients		✔
2	Median Door to Puncture (DTP) Time	✔	✔
3	Door to Puncture Time within 90 minutes		✔
4	Median Door to Start of Revascularization (DTSR)		✔
5	Door to Start of Revascularization within 120 minutes		✔
6	Door to Recanalization/Reperfusion (DTRp) within 120 minutes		✔
7	Picture to Puncture (PTP) Time within 60 minutes		✔
8	Median Puncture to Recanalization/Reperfusion (PTRp) Times		✔
9	TICI Post-Treatment Reperfusion Grade (0,1,2a, 2b, 3)	✔	
10	Rate of Substantial Reperfusion (TICI 2b or 3)		✔
11	Thrombolysis in Cerebral Infarction (TICI) Post-Treatment Reperfusion Grade (2b vs. 3)		✔
12	Discharge Disposition following MER (EVT)		✔
13	90-Day Modified Rankin Scores (mRS) following MER (EVT)	✔	✔

General Measure Inclusions and Exclusions:

Inclusion	Exclusion	Exceptions

• Patients age 18 years and old admitted to the hospital who have a diagnosis of acute ischemic stroke
 	
AND
 	
• Patient received endovascular thrombectomy therapy
	• Stroke occurred after hospital arrival
	
	• Missing or Unknown date/time fields for the following:
	  – Arrival time
	  – Time Last Known Well
	  – Brain Imaging
	  – Arterial Puncture
	
	• Negative time calculations
	
	• Patients with length of stay > 120 days
	
	• Enrolled in a clinical trial as part of their treatment for stroke
	
	• Elective carotid intervention
		• Documented reason for delay in performing Mechanical Endovascular Reperfusion
		
		AND
		
		• Specific reason for delay:
		  – Initial refusal
		  – Care team unable to determine eligibility
		  – Management of concomitant emergent
		  – Investigational or experimental protocol for thrombolysis

Unique to Patient Eligibility:

Acceptable Reasons for Not Performing Endovascular Therapy:

1. Pre-stroke mRS >1

2. No evidence of proximal occlusion

3. NIHSS < 6

4. Brain imaging not favorable/hemorrhagic transformation (ASPECTS score < 6)

5. Groin puncture could not be initiated within 6 hours of symptom onset

6. Anatomical reason-unfavorable vascular anatomy that limits access to the occluded artery

7. Patient/family refusal

8. MER performed at outside hospital

Percentage of eligible patients with ischemic stroke due to large vessel occlusion who received endovascular therapy

Inclusions:

1. All patients age 18 years and older admitted to the hospital who have a diagnosis of acute ischemic stroke

2. Patients with a clinical impression of stroke due to occlusion of the distal intracranial carotid artery (ICA) or the proximal middle cerebral artery (MCA/M1)

3. NIHSS closest to the start of the procedure is greater than or equal to 6

4. Whose time last known well is ≤ 4.5 hours prior to arrival

Exclusions: Same as general exclusions

Exception: Patients who had a contraindication or documented reason for not performing MER


Comparison of the percentage of eligible patients who received MER at one hospital against all hospitals performing endovascular therapy for each quarter in 2017.

11

Histogram of all times from hospital arrival to arterial puncture for patients with acute ischemic stroke who receive endovascular therapy

Door to Puncture (DTP) Times

Legend: My Hospital-Q1 2017 | My Hospital-Q2 2017 | All Hospitals-Q1 2017 | All Hospitals-Q2 2017
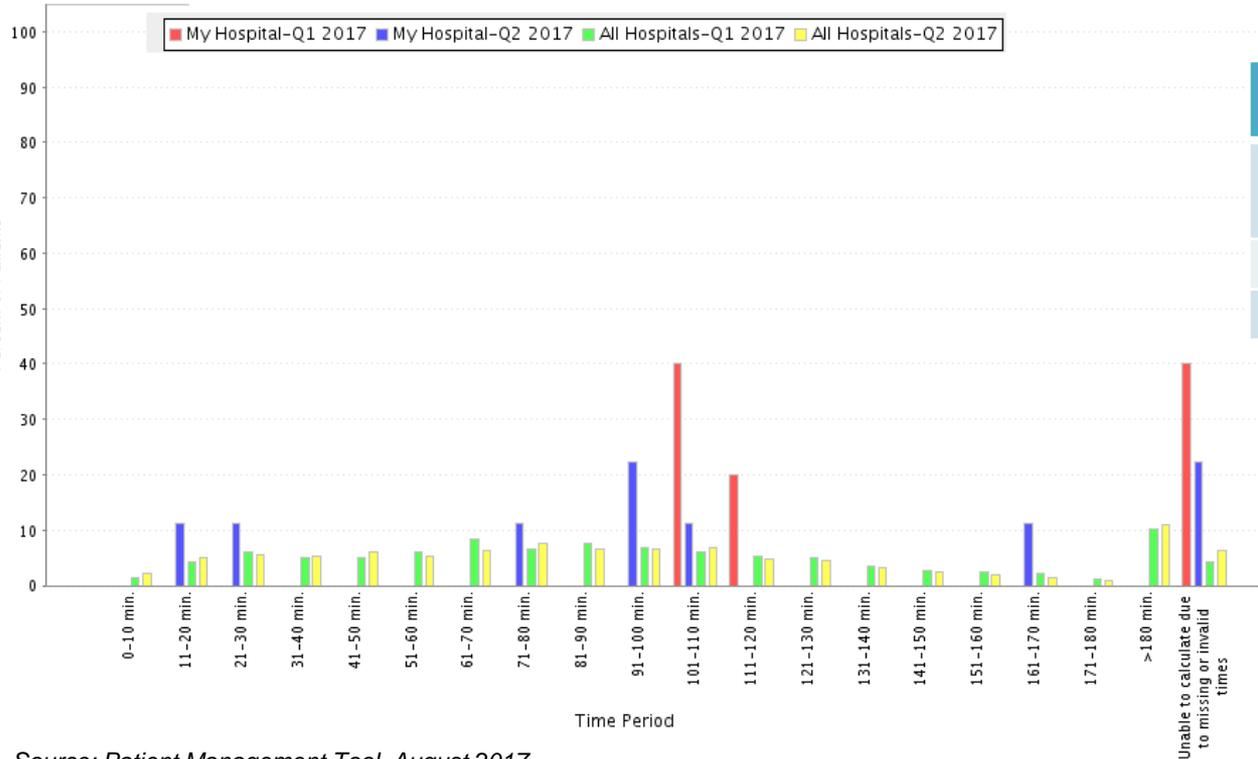
Median DTP Times (minutes)		
	My Hospital	All Hospitals
Q1 2017	106	86
Q2 2017	95	85

The median DTP rate for this one hospital decreased by 11 minutes from Q1 2017 to Q2 2017. However, its median DTP times remained higher against all the hospitals.

Source: Patient Management Tool. August 2017.

12

3. DTP Time within 90 minutes

Percentage of patients with acute ischemic stroke who receive endovascular therapy and for whom arterial puncture time is ≤ 90 minutes after hospital arrival.

|	
Inclusions:	1. All patients age 18 and older admitted to the hospital who have a diagnosis of acute ischemic stroke 2. Received mechanical endovascular reperfusion therapy during the hospital admission
Exclusions:	Same as general exclusions
Exceptions:	Patients whose arterial puncture time is > 90 minutes after arrival **AND** Patients who had a documented reason for delay in performing mechanical endovascular reperfusion

Door to Puncture (DTP) Time within 90 minutes
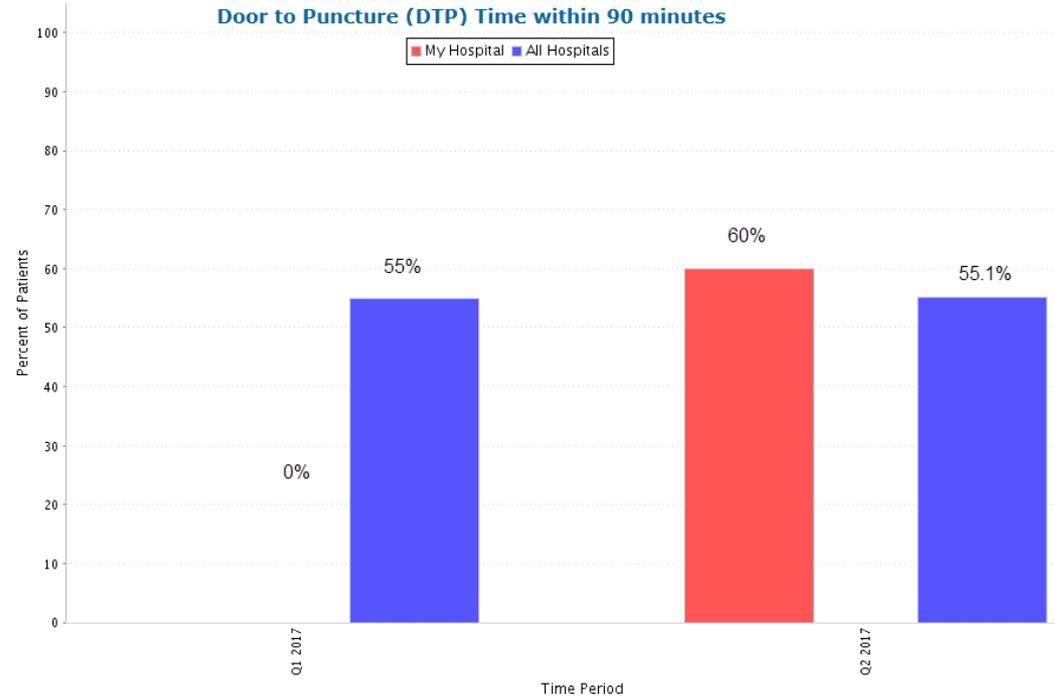
Comparison of one hospital against all hospitals for DTP time within 90 minutes. No data available for "My hospital" in Q1 2017. Performance for "My hospital" in Q2 2017 was higher than all other hospitals participating in GWTG ®.

Source: Patient Management Tool. August 2017.

13

Histogram of all times from hospital arrival to first pass (i.e. deployment) of device for patients with acute ischemic stroke who receive endovascular therapy

(DTSR)

Door to Start of Revascularization (DTR) Times
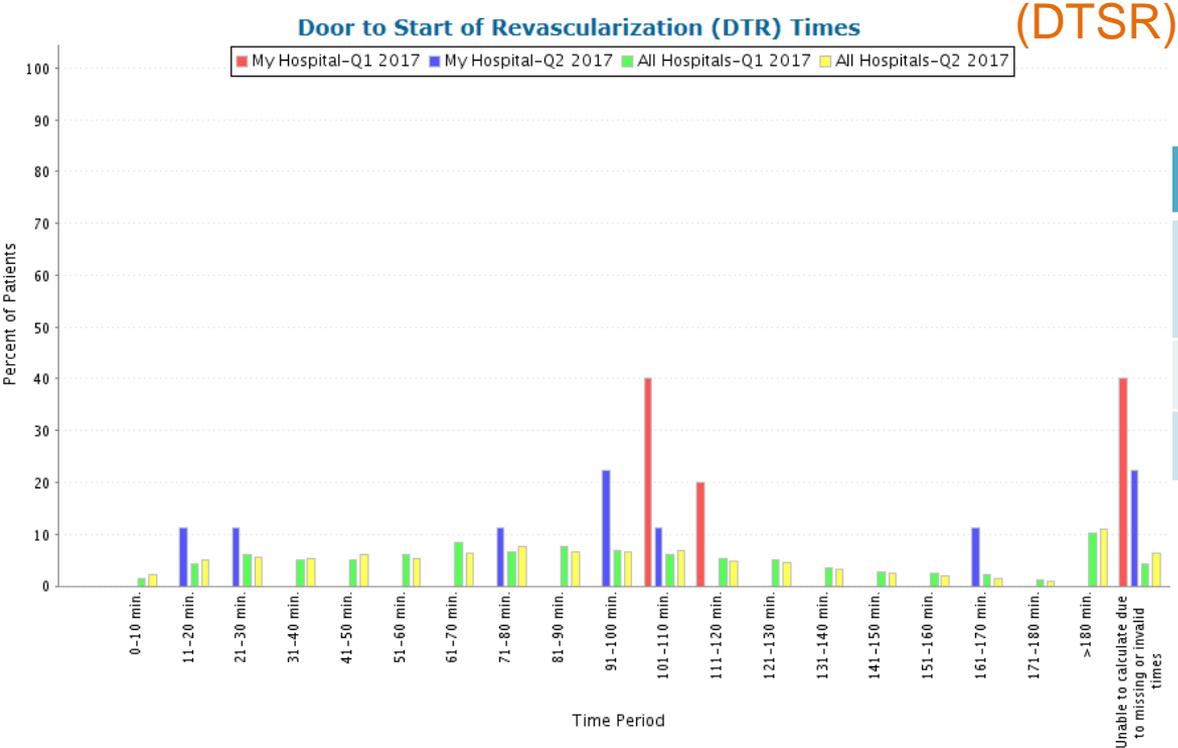
Median DTFP Time (minutes)		
	My Hospital	All Hospitals
Q1	106	86
Q2	95	85

The median DTR rate for this one hospital decreased by 11 minutes from Q1 2017 to Q2 2017. However, its median DTR times remained higher against all the hospitals.

Source: Patient Management Tool. August 2017.

14

5. DTSR within 120 minutes

Percentage of patients with acute ischemic stroke who receive endovascular therapy and for whom the first pass (i.e. deployment) of the device is ≤ 120 minutes after hospital arrival.

|	
Inclusions:	1. All patients age 18 and older admitted to the hospital who have a diagnosis of acute ischemic stroke 2. Received mechanical endovascular reperfusion therapy during the hospital admission
Exclusions:	Same as general exclusions
Exception:	Patients for whom first pass time is > 120 minutes **AND** Patients who had a documented reason for delay in performing mechanical endovascular reperfusion

Source: Patient Management Tool. August 2017.

Door to Start of Revascularization (DTR) within 120 minutes (DTSR)

Comparison of the Door to Start of Revascularization within 120 minutes after hospital arrival for one hospital benchmarked against all hospitals.

15
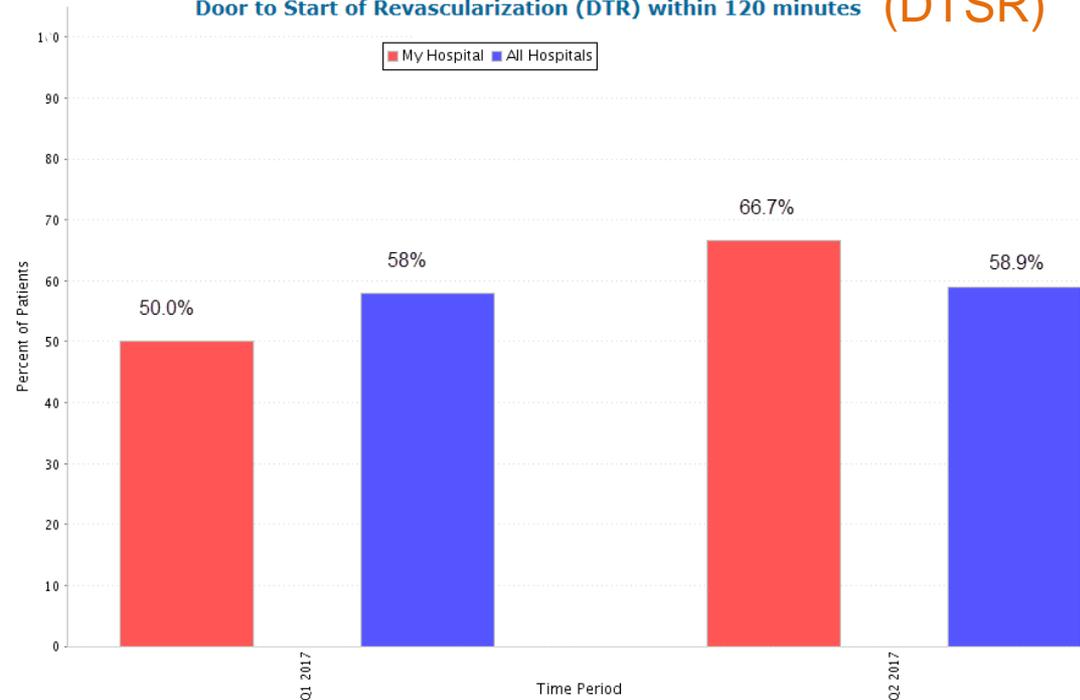
6. Door to Reperfusion within 120 minutes

Percentage of patients with acute ischemic stroke who receive endovascular therapy and for whom the time from hospital arrival to reperfusion with TICI grade 2b/3 is ≤ 120 minutes.

|	
Inclusions:	1. All patients age 18 and older admitted to the hospital who have a diagnosis of acute ischemic stroke 2. Received mechanical endovascular reperfusion therapy during the hospital admission
Exclusions:	Same as general exclusions
Exceptions:	Patients for whom first pass time is > 120 minutes **AND** Patients who had a documented reason for delay in performing mechanical endovascular reperfusion

Door to Recanalization/Reperfusion (DTRp) within 120 Minutes
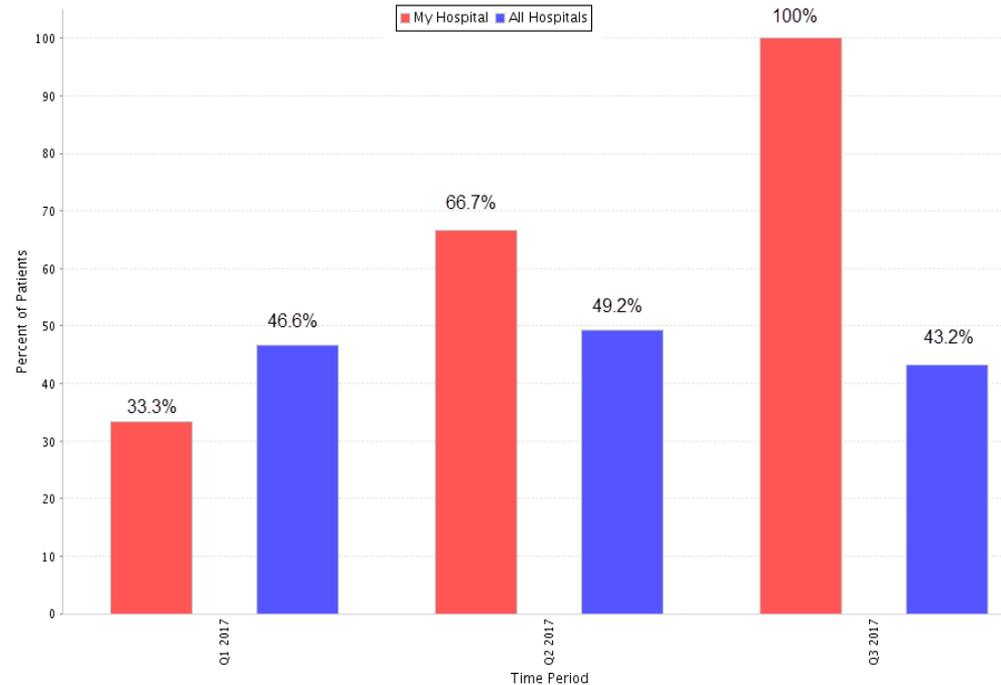
Snapshot of one hospitals performance in comparison to all hospitals in 2017 for achieving DTRp within 120 minutes.

Source: Patient Management Tool. August 2017.

Percentage of patients with acute ischemic stroke who receive endovascular therapy and for whom arterial puncture time is ≤ 60 minutes after brain imaging time.

|	
Inclusions:	1. All patients age 18 and older admitted to the hospital who have a diagnosis of acute ischemic stroke 2. Received mechanical endovascular reperfusion therapy during the hospital admission
Exclusions:	Same as general exclusions
Exception:	Patients for whom arterial puncture time was > 60 minutes **AND** Patients who had a documented reason for delay in performing mechanical endovascular reperfusion
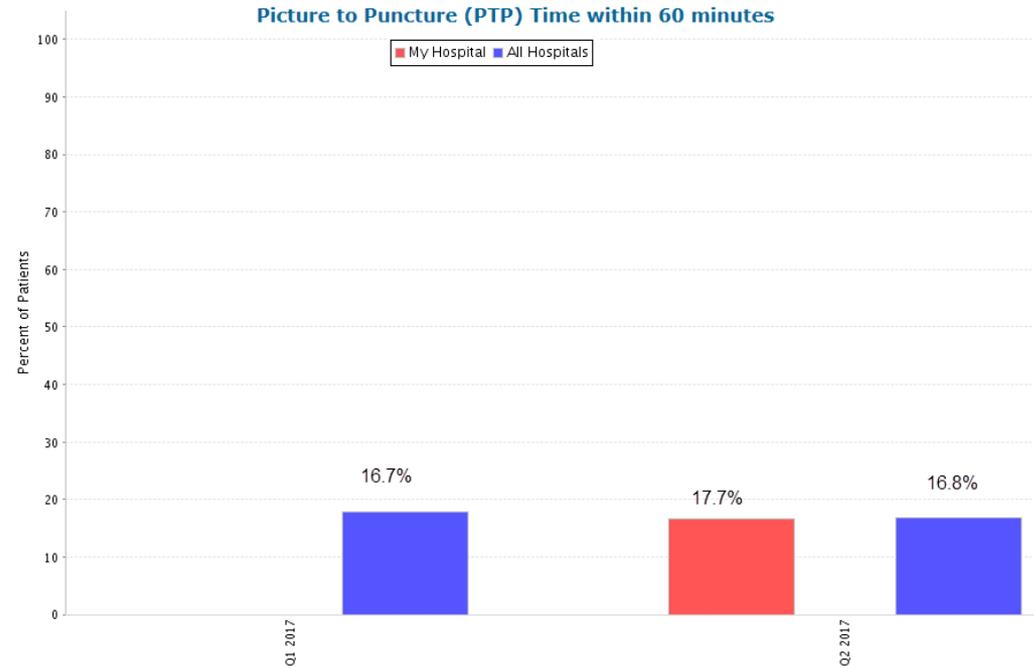
Comparison of one hospital against all hospitals. In Q2 2017, hospital A had a higher number of their patients within PTP times under 60 minutes.

17

Source: Patient Management Tool. August 2017.

Histogram of all times from arterial puncture to reperfusion with TICI grade 2b or 3 for patients with acute ischemic stroke who receive endovascular therapy.

Inclusions:	1. All patients age 18 and older admitted to the hospital who have a diagnosis of acute ischemic stroke
	2. Received mechanical endovascular reperfusion therapy during the hospital admission.
	3. Had a post-treatment TICI grade of 2b or 3
Exclusions:	Same as general exclusions
Exception:	None

Puncture to Recanalization/Reperfusion (PTRp) Times

Legend: All Hospitals–Q1 2017, All Hospitals–Q2 2017
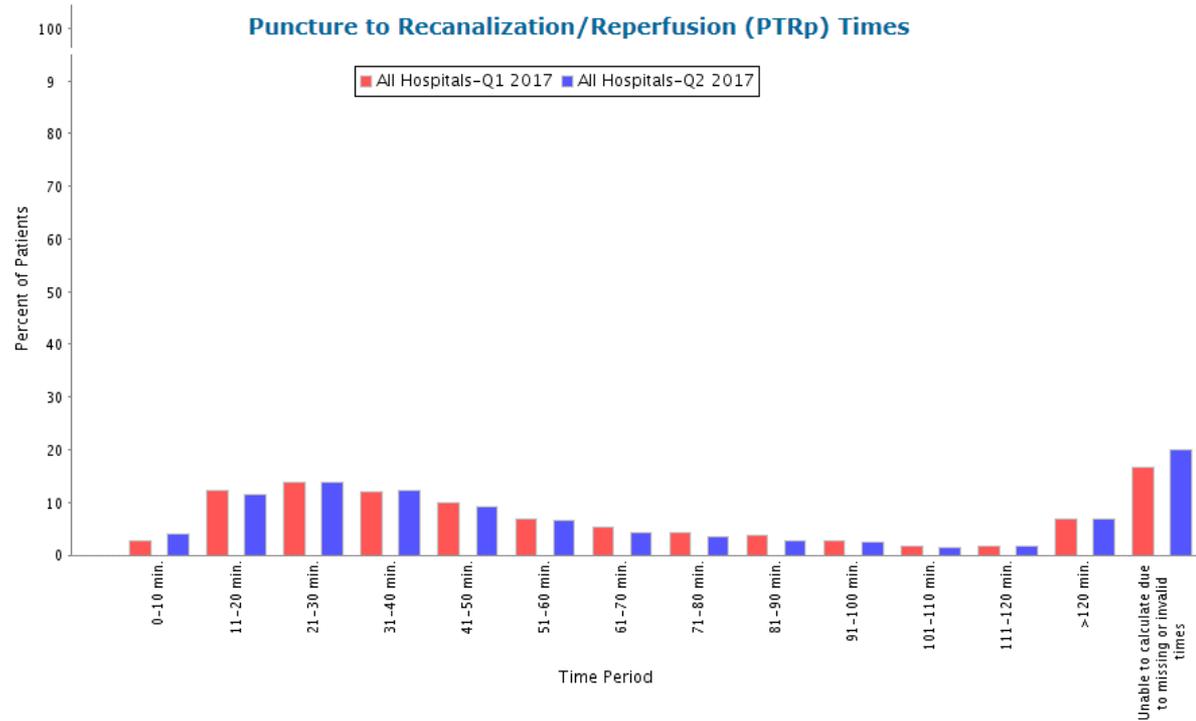
Comparison of the distribution of reperfusion times with TICI grade 2b or 3 for Q1 2017 and Q2 2017 for all hospitals.

Source: Patient Management Tool. August 2017.

18

Percentage of patients with acute ischemic stroke who receive endovascular therapy and have post-reperfusion TICI grade 2b or 3.

Inclusions:	1. All patients age 18 and older admitted to the hospital who have a diagnosis of acute ischemic stroke 2. Received mechanical endovascular reperfusion therapy during the hospital admission
Exclusions:	Same as general exclusions
Exception:	None

Rate of Substantial Reperfusion

Comparison of the Rate of Substantial Reperfusion for all patients who had TICI grade 2b or 3 for one hospital benchmarked against all hospitals for Q1 2017 and Q2 2017.

Source: Patient Management Tool. August 2017.

19

Patients with acute ischemic stroke who undergo successful endovascular therapy grouped by post-treatment TICI Grade (2b versus 3).

Inclusions:

1. All patients age 18 and older admitted to the hospital who have a diagnosis of acute ischemic stroke

2. Received mechanical endovascular reperfusion therapy during the hospital admission.

3. Patients who had a post-treatment TICI grade of 2b or 3

Exclusions:	Same as general exclusions
Exception:	None

Thrombolysis in Cerebral Infarction (TICI) Post-Treatment Reperfusion Grades for Successful Mechanical Endovascular Reperfusion Therapy
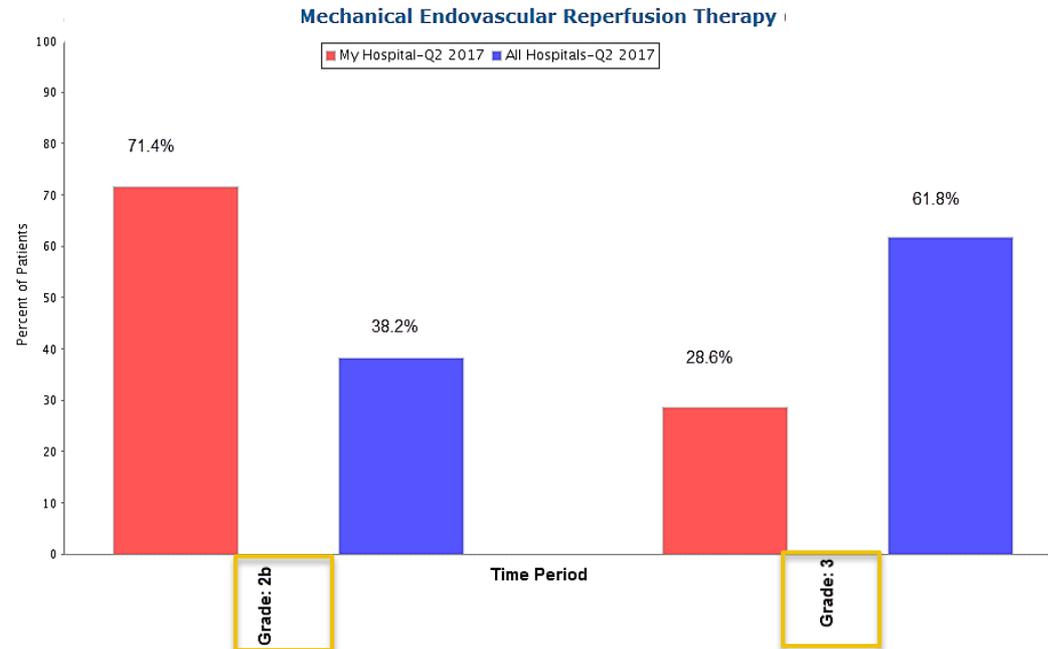
Comparison of the post-treatment TICI grade 2b and 3 against the benchmark (All hospitals) in Q2 2017. In the graph above, the individual hospital had higher % of patients with post-treatment TICI grade 2b and a lower percentage of patients with TICI grade 3 in comparison to the benchmark.

Source: Patient Management Tool. August 2017.

20

Patients with acute ischemic stroke who receive endovascular therapy grouped by Discharge Disposition

Inclusions:	1. All patients age 18 and older admitted to the hospital who have a diagnosis of acute ischemic stroke 2. Received mechanical endovascular reperfusion therapy during the hospital admission
Exclusions:	Same as general exclusions
Exceptions:	None

Discharge Disposition following Mechanical Endovascular Reperfusion Therapy
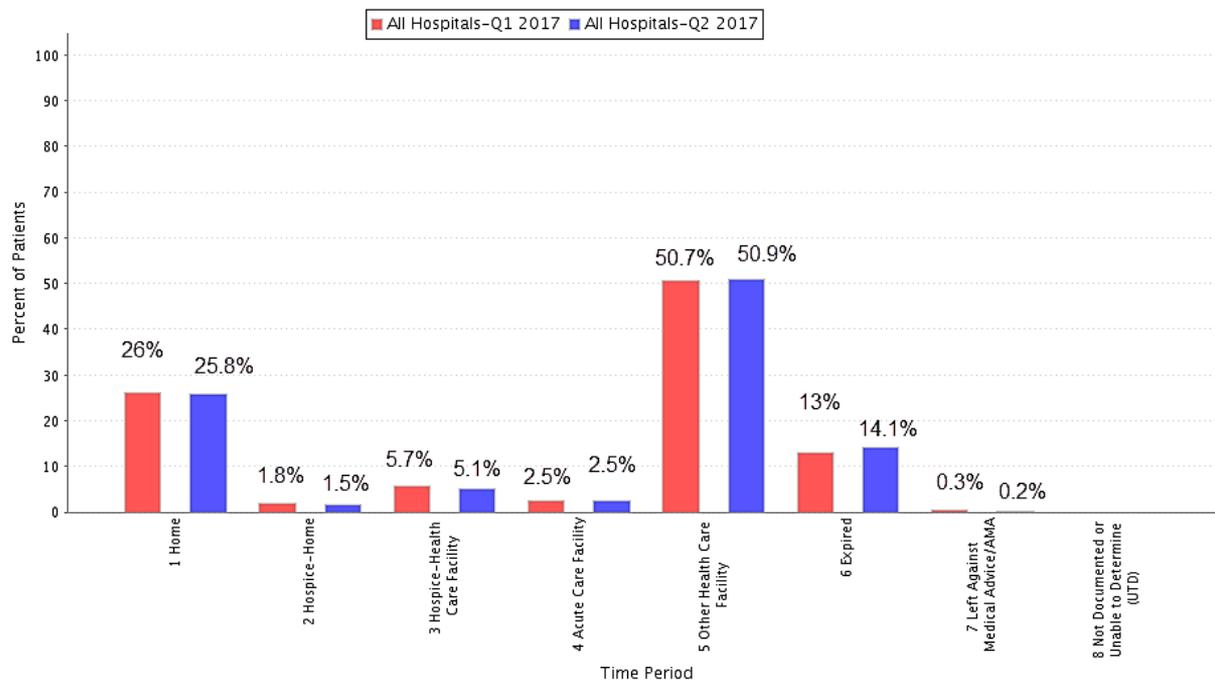
All patients for all hospitals grouped by discharge disposition, with one bar for each potential discharge location.

Source: Patient Management Tool. August 2017.

21

Patients with acute ischemic stroke who received endovascular therapy grouped by modified Rankin Score at 90 days post-discharge

Inclusions:

1. Patients age 18 and older admitted to the hospital who have a diagnosis of acute ischemic stroke
2. Patient received mechanical endovascular reperfusion therapy during the hospital admission.
3. Patient had a 90 day (≥75 days and ≤105 days) mRS obtained via telephone or in-person and documented

Exclusions: Same as general exclusions

Exceptions: None

90-Day Modified Rankin Scores (mRS) following Mechanical Endovascular Reperfusion Therapy

Legend: My Hospital–Q2 2017 ■ All Hospitals–Q1 2017 ■ All Hospitals–Q2 2017

- No symptoms
- No significant disability despite symptoms
- Slight disability
- Moderate disability
- Moderately severe disability
- Severe disability
- Dead
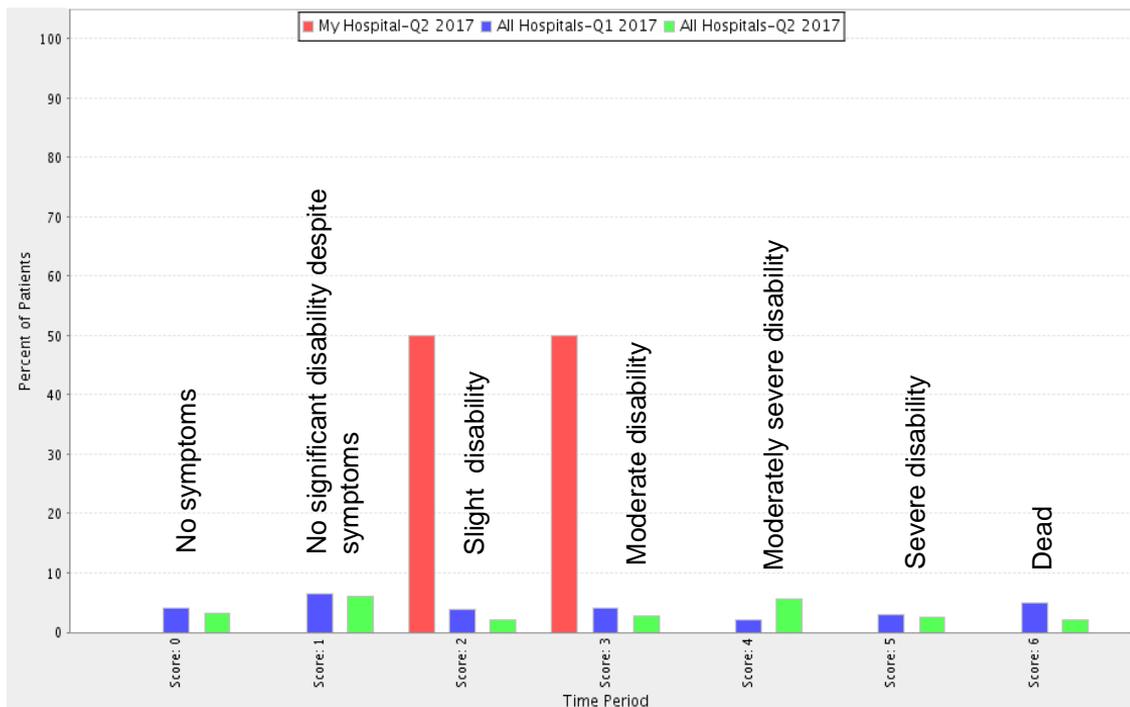
Measure displays histogram of the by 90-day mRs scores with one bar representing the potential mRS scores (0 – 6).

Source: Patient Management Tool. August 2017.

22

PMT Updates:
Hospitalization Tab

Brain Imaging Section:

Data Element: Was a target lesion identified?

| Admin | Clinical Codes | Admission | **Hospitalization** | Advanced Stroke Care | Discharge | Optional | Core Measures | Measures |

Brain Imaging

Was Vascular imaging (CTA, MRA) performed? ◯ Yes ◯ No ©

Was a target lesion identified? ◯ Yes ◯ No ©

Clarification to coding instructions:
Indicate if a target lesion (large vessel occlusion) is visualized in the advanced imaging

Brain Imaging Section Continued:

Data Element: If yes, select vessel(s) identified:

1. Updated the display label for a response option
2. Added two additional options for "Other/UTD"

Used to determine patient eligibility for EVT based on the vessel identified

| Admin | Clinical Codes | Admission | **Hospitalization** | Advanced Stroke Care | Discharge | Optional | Core Measures | Measures |

Brain Imaging

Was Vascular imaging (CTA, MRA) performed? ○ Yes ○ No ©
Was a target lesion identified? ○ Yes ○ No ©

If yes, select vessel(s) identified:

Indicate site(s) of occlusion visualized in the advanced brain imaging?

☐ ICA

Previously labeled as "ICA Terminus"

☐ Intracranial ICA
☐ Cervical ICA
☐ Other/UTD

Select "Other/UTD" when not able to determine which vessel segment or artery not listed (e.g. ACA, M3, etc.)

☐ MCA
☐ M1
☐ M2
☐ Other/UTD
☐ Basilar Artery
☐ Other

Select when 'other cerebral artery branch' is not listed (e.g. vertebral artery)

25

PMT Updates:
Advanced Stroke Care Tab

Endovascular Stroke Treatment Section

1st section: 7 GWTG® Data Elements Display

| Admin | Clinical Codes | Admission | Hospitalization | **Advanced Stroke Care** | Discharge | Optional | Measures | Historic |

Catheter-based/Endovascular Stroke Treatment

^What is the date and time of skin puncture at this hospital to access the arterial site selected for endovascular treatment of a cerebral artery occlusion?

MM/DD/YYYY HH24:MI

^^Was a mechanical endovascular reperfusion procedure attempted during this episode of care (at this hospital)? ○ Yes ○ No ©

^^Are reasons for not performing mechanical endovascular reperfusion therapy documented? ○ Yes ○ No ©

Yes: Patient taken to the procedure suite with the intent of performing endovascular thrombectomy and at minimum arterial puncture was performed.

No: Patient was taken to the procedure suite, but did not proceed with endovascular thrombectomy (e.g. improvement in patient condition or clot dissolved, thus procedure aborted).

Yes: There is a documented reason by a physician/ANP/PA for not initiating mechanical endovascular reperfusion therapy during this episode of care.

No: There is no documented reason in the medical record by a physician/ANP/PA for why mechanical endovascular reperfusion therapy was not initiated during this episode of care.

27

Asterisk (*) indicates reason selected does not exclude patient from MER measures.

Admin	Clinical Codes	Admission	Hospitalization	**Advanced Stroke Care**	Discharge	Optional	Measures	Historic

Catheter-based/Endovascular Stroke Treatment

^^Reasons for not performing mechanical endovascular reperfusion therapy (select all that apply):

☐ Significant pre-stroke disability (pre-stroke mRS > 1)
☐ No evidence of proximal occlusion
☐ NIHSS <6
☐ Brain imaging not favorable/hemorrhage transformation (ASPECTS score <6)
☐ Groin puncture could not be initiated within 6 hours of symptom onset
☐ Anatomical reason - unfavorable vascular anatomy that limits access to the occluded artery
☐ Patient/family refusal
☐ MER performed at outside hospital
☐ Equipment-related delay *
☐ No endovascular specialist available *
☐ Delay in stroke diagnosis *
☐ Vascular imaging not performed *
☐ Advanced Age *
☐ Other * [_____]

* These reasons do not exclude from measure population

Inferences for the following three reasons can be made:
1. **No evidence of proximal occlusion**
2. **NIHSS <6**
3. **Brain imaging not favorable/hemorrhage transformation (ASPECTS score < 6)**

All other reasons require documentation by a physician/APN/PA

Endovascular Stroke Treatment Section Continued

Asterisk (*) indicates reason selected does not exclude patient from MER measures.

Admin	Clinical Codes	Admission	Hospitalization	**Advanced Stroke Care**	Discharge	Optional	Measures	Historic

Catheter-based/Endovascular Stroke Treatment

^^If MER treatment at this hospital, type of treatment:

- ☐ Retrievable stent
- ☐ Other mechanical clot retrieval device beside stent retrieval
- ☐ Clot suction device
- ☐ Intracranial angioplasty, with or without permanent stent
- ☐ Cervical carotid angioplasty, with or without permanent stent
- ☐ Other

- **Examples of a Retrievable stent: Solitaire and Trevo**
- **Example of Other Mechanical Clot Retriever: Merci Retrieval System**
- **Example of a Clot Suction Device: Penumbra Stroke System**

Endovascular Stroke Treatment Section Continued

Asterisk (*) indicates reason selected does not exclude patient from MER measures.

| Admin | Clinical Codes | Admission | Hospitalization | **Advanced Stroke Care** | Discharge | Optional | Measures | Historic |

Catheter-based/Endovascular Stroke Treatment

^^Is a cause(s) for delay in performing mechanical endovascular reperfusion therapy documented?   ○ Yes ○ No ⊙

- ☐ Social/religious
- ☐ Initial refusal
- ☐ Care-team unable to determine eligibility
- ☐ Management of concomitant emergent/acute conditions such as cardiopulmonary arrest, respiratory failure (requiring intubation)

^^Reasons for delay (select all that apply):

- ☐ Investigational or experimental protocol for thrombolysis
- ☐ Delay in stroke diagnosis *
- ☐ In-hospital time delay *
- ☐ Equipment-related delay *
- ☐ Other * [   ]

The response options in December 2017 will expand to include the following 2 reasons:
   * Need for additional imaging
   * Endovascular suite not available

Yes: There is a documented reason for delay in initiating mechanical endovascular reperfusion therapy when it's greater than 120 minutes after hospital arrival.

No: There is no documented reason in the medical record for why there was a delay in initiating mechanical endovascular reperfusion therapy during this episode of care.

Endovascular Stroke Treatment Section Continued

The technical goal of the thrombectomy procedure should be a TICI grade 2b/3 angiographic result to maximize the probability of a good functional clinical outcome (Class I; Level of Evidence A).

| Admin | Clinical Codes | Admission | Hospitalization | **Advanced Stroke Care** | Discharge | Optional | Measures | Historic |

Catheter-based/Endovascular Stroke Treatment

^^Thrombolysis in Cerebral Infarction (TICI) Post-Treatment Reperfusion Grade
○ Grade 0　○ Grade 1　◉ Grade 2a　○ Grade 2b　○ Grade 3　○ ND ©

^Is there a documented TICI reperfusion gradepost-treatment?
○ 1 - A TICI reperfusion grade greater than or equal to (>=) 2B was documented posttreatment
○ 2 - A TICI reperfusion grade less than (<) 2B was documented post-treatment
○ 3 - A TICI reperfusion grade was not done post-treatment, OR Unable to determine (UTD) from the medical record documentation ©

^^Date/time of first post-reperfusion TICI grade that was 2b or 3
MM/DD/YYYY HH24:MI ▾
☐☐/☐☐/☐☐☐☐ ☐☐:☐☐ 🗓
MM　DD　YYYY　HH　MI
☑ ^^Grade 2b or 3 not achieved

Update to form logic:
When user selects TICI Post Treatment grade = 0,1, 2a, or ND THEN this question is automatically checked by the system.

If a TICI reperfusion grade was not done post treatment or cannot be determined from medical record, select "ND."
TICI grade must be documented by Physician/APN/PA.

Complications

2nd Section: New addition only appears for those sites submitting data to The Joint Commission.

Note: ^ (1 carat) indicates TJC element. ^^ (2 carats) indicates GWTG® - Stroke

2 Options:

1. Leverage the auto-population feature

2. Manually enter NIHSS score

32

- Patients should receive endovascular therapy with a stent retriever if they meet all of the eligibility criteria.*

- Reduced time from symptom onset to reperfusion with endovascular therapies is strongly associated with better clinical outcomes.**

- EVT measures capture the various time intervals prior to initiation of treatment. This may identify areas for improvement.

- Updates reflected in the PMT aim to harmonize TJC and GWTG® data elements.
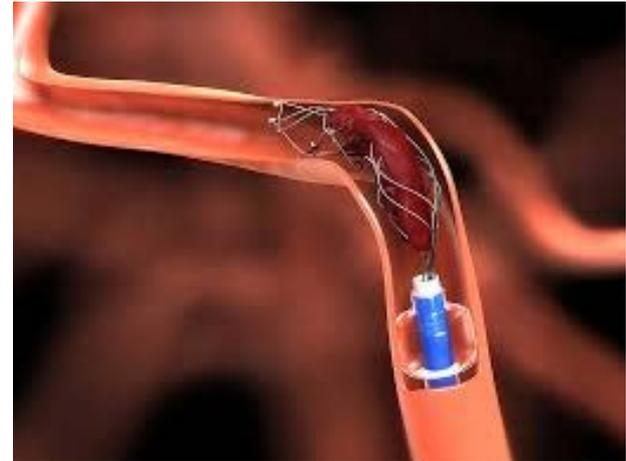
Note: * Class 1; Level of Evidence A. AHA/ASA recommended criteria includes the following: Age ≥ 18, pre-stroke mRs score 0-1, IV tPA within 4.5 hours of LKW, causative occlusion of the ICA or MCA, NIHSS score ≥ 6, ASPECTS ≥ 6, and if treatment can be initiated (groin puncture) within 6 hours of symptom onset. ** Class 1' Level of Evidence B-R.

Questions
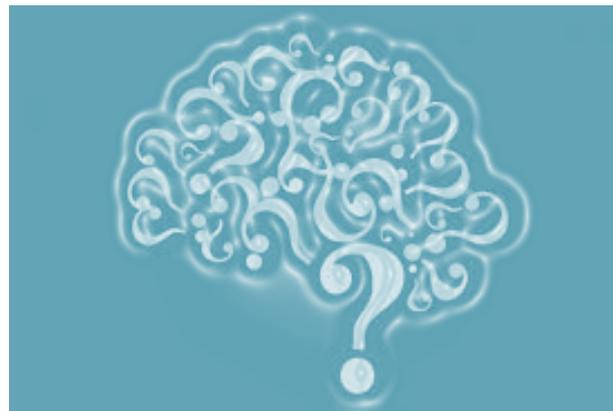
Thank you for your participation in
Get With the Guidelines® - Stroke