WISCONSIN COVERDELL
STROKE PROGRAM

Wisconsin Telestroke Toolkit

WISCONSIN DEPARTMENT
of HEALTH SERVICES

P-03458 (05/2023)

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OVERVIEW

Every second counts when treating a patient afflicted with stroke. Stroke is the fifth leading cause of death in the United States and a leading cause of disability. About 795,000 people have a stroke each year in the United States. This means one stroke occurs every 40 seconds (CDC, 2021). State and regional stroke systems of care, and initiatives that combine and utilize resources and expertise within them, have been shown to be an effective way to reduce morbidity and mortality. The stroke system of care (SSoC) begins with an increase in public awareness around stroke signs and symptoms, and continues from stroke onset, "…through emergency medical services evaluation and transport, in-hospital, and to outpatient care and follow up." (CDC, 2021). It is incumbent on Wisconsin hospitals to offer stroke patients seamless, timely care regardless of where they fall in the care continuum. The goal of a SSoC is to ensure all stroke patients receive rapid recognition, treatment, and transport to a hospital capable of providing the appropriate level of stroke care, and to optimize their recovery.

Opportunities for improving SSoC exist across Wisconsin. Stroke care delivery may at times lack systematic stroke protocols or have limited personnel with stroke expertise, which may result in a lack of clear coordination and inefficient resource allocation leading to unfavorable stroke outcomes. Hospitals without substantial stroke-specific resources (spoke), which are disproportionately smaller and located in rural areas, may encounter these situations and require transfer to a larger hospital (hub) that is able to manage and treat more complex stroke patients. The interfacility transfer process between hub and spoke are not always feasible or a viable option. Telestroke offers an opportunity for virtual expert neurological consultation to otherwise underserved areas regardless of the patient's physical location. To ensure timely and evidence-based treatment is provided and the best outcomes are achieved for the acute stroke patient, specific, clear, and standardized telestroke protocols, as well as communication and feedback, are essential.

Telestroke is a rapidly growing application of telemedicine, with variations existing across different hospitals, clinics, and settings. This *Telestroke Toolkit* will focus on the prototype of the telestroke consultation in the treatment of stroke patients from a larger hub hospital to its network of smaller spoke hospitals (Weschler, 2017). To assist all Wisconsin stroke care providers in providing the best care to our communities, the Wisconsin Coverdell Stroke Program (Coverdell) and American Heart Association (AHA) partnered to develop a Telestroke Quality Improvement Task Force (TF).

ACKNOWLEDGEMENTS

This publication was made possible through federal funds provided by the Paul Coverdell National Acute Stroke Program (grant cycle 2021–2024) through the Centers for Disease Control and Prevention (CDC).

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TASK FORCE AND CHARTER

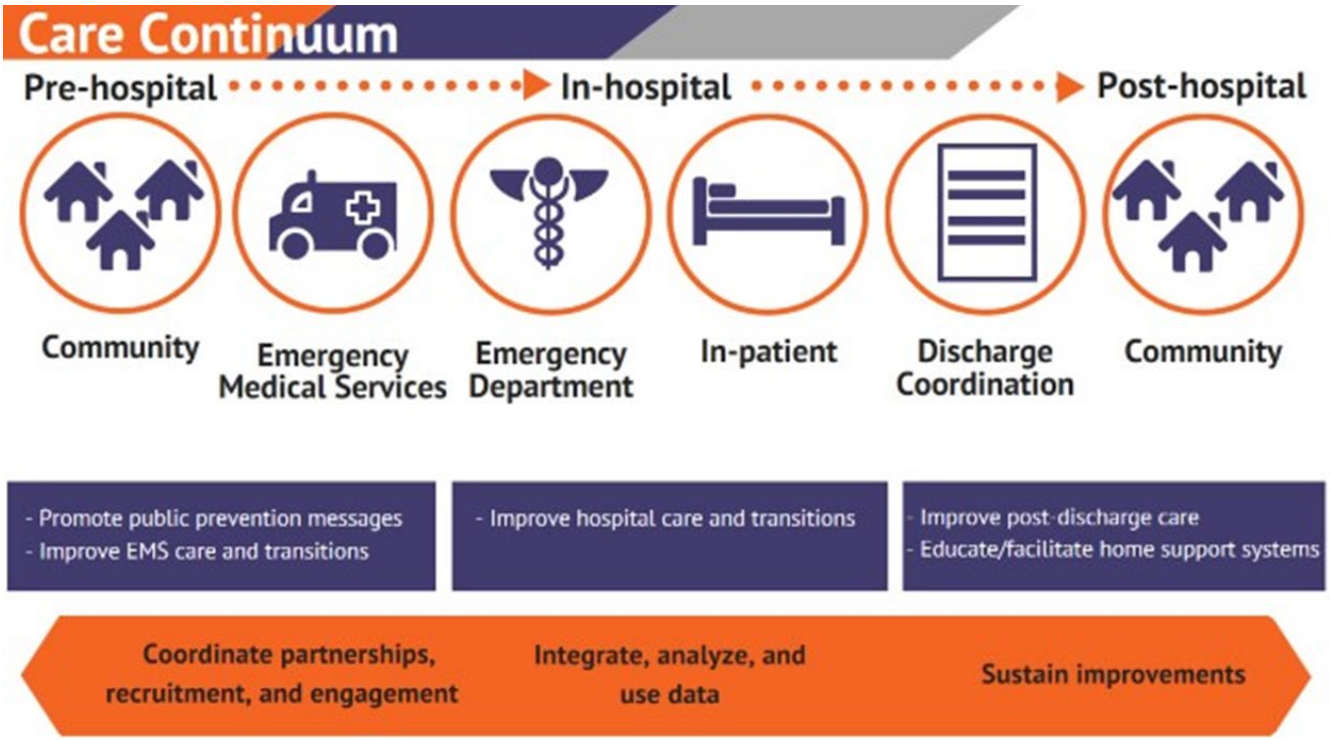
Coverdell and AHA in Wisconsin (WI) received feedback from stroke coordinators throughout the state regarding barriers to the effective use of telestroke networks and SSoC, and the benefit that conversations among peers may provide in identifying and addressing these barriers. With this, the Telestroke TF was created in June 2021, facilitated by Coverdell and AHA, with 15 participating hospital systems.

The mission of the TF was to develop an extensive guide for telestroke care in Wisconsin by identifying and directly addressing challenges spoke hospitals encounter in providing time-sensitive, evidence-based stroke care. A pre-meeting survey was completed by participating hospitals, which was utilized to inform current challenges and successes. A charter was created (see Appendix 1) to guide the TF with the defined mission, vision, and goals. Starting in the summer of 2021, the Telestroke TF met on eight occasions with ad hoc communication among members in between formal meetings. The TF reviewed hospitals' telestroke protocols, algorithms, order sets, and model share guidelines. This toolkit is a result of the TF's work, summarizes our findings from this review and incorporates the AHA and American Stroke Association recommendations for telestroke published in January 2017.

The scope of this toolkit is on the acute stroke patient arriving to the emergency department of a community hospital (ED). The toolkit will provide the end-user with resources to coordinate effective telestroke processes and involvement within the local SSoC. In doing so, this will assist the hospital site or system in building a telestroke program and infrastructure.

Emergency Medical Services (EMS)

Any effort to improve SSoC processes requires EMS involvement that stresses the importance of their pre-arrival actions. In the stroke care continuum, the initial assessment and actions performed prior to hospital arrival by EMS providers will have significant impact on the patient's subsequent care.



For quicker and more effective treatment, EMS providers are ideally the first contact a stroke patient has with medical professionals. The TF created a document titled: *The Importance of EMS Pre-notification* (Wisconsin, 2021). EMS pre-notification of a suspected acute stroke patient assists the receiving hospital in assembling the appropriate personnel and resources before the patient arrives, which will increase the probability of the appropriately screened acute stroke patient receiving time-sensitive treatment. Eligible stroke patients can receive intravenous (IV) thrombolytics within 4.5 hours of last known well (LKW), and mechanical thrombectomy within 24 hours of LKW.

To further assist EMS in care of the acute stroke patient, the Wisconsin Coverdell team developed a document to assist EMS in identifying an accurate LKW time titled, *The Importance of an Accurate Last Known Well and Symptom Onset Time* (Wisconsin, 2019). Precise identification of LKW and symptom onset time are essential to direct patient care, treatment, and for the purposes of determining eligibility for thrombolytic therapy.

In January 2022, the TF formed a subgroup to review existing EMS education to discern if additional education is needed. Next steps for this subgroup included reviewing existing EMS education and needed resources to fill potential gaps that exist.

It is important to be aware that, in addition to this subgroup, there are multiple committees in Wisconsin that also look into ways to continually improve EMS service delivery which includes ongoing EMS education:

- Professional Ambulance Association of WI (PAAW)
- Wisconsin Fire Chiefs Association
- Wisconsin EMS Association
- Professional Firefighters of Wisconsin
- Physicians Advisory Committee, EMS Advisory Board (PAC)
- WI EMS Advisory Board
- Wisconsin Chapter, American College of Emergency Physicians

FRAMEWORK OF A TELESTROKE NETWORK

For a Telestroke Network that links hub and spoke hospital(s), the TF had working assumptions that: the telestroke infrastructure between the hub and spoke has been attained and implemented with all necessary training; legal, regulatory, and financial agreements have been secured and finalized; and methods of sustaining the relationship between hospitals and clinics have been identified.

Prior to the start of a "go live date" for the use of telestroke, hub and spoke stakeholders should engage in pre-implementation activities including: a review of the spoke hospital's stroke code protocol; thrombolytic administration protocol; and transfer agreements. Other topics to address include ability of the spoke site to obtain advanced imaging exceeding head computed tomography (CT), and training needs for nurses to assist with the National Institutes of Health Stroke Scale (NIHSS) with the telestroke provider. The hub and spoke should also determine an alternate or back-up plan in the event of equipment failures. The TF created a framework (see Appendix 2) where the following process items for developing and maintaining a telestroke program were defined:

- Decision to call-identification of stroke
- Clinician panel
- Telestroke consult through video
- Treatment and transfer process
- Feedback
- Patient satisfaction

Decision to call-identification of stroke

A one-page resource *Telestroke Consult Criteria* (see Appendix 3) was developed to assist in communicating the current rationale and guidelines for a telestroke consult to emergency providers participating in stroke codes. Also included in this resource is a timeline illustrating critical data points with target time goals, based on the AHA Target: Stroke Phase III Suggested Time Interval Goals.

Clinician panel

The TF determined the need for an enduring video resource of peer stroke providers discussing telestroke that could be accessed on demand. To meet this need, a roundtable discussion took place and was video recorded in January 2022. This educational session featured stroke experts across Wisconsin, each representing different professional roles within the telestroke process from four different hospital systems in Wisconsin. The Telestroke Task Force Clinical Panel included two vascular neurologists, an emergency department physician, and a registered nurse (RN) who is also a stroke coordinator. The experts presented on items such as their system's telestroke process, perceived barriers to utilizing telestroke and solutions to overcome them, as well as challenges in performing a telestroke consult.

Telestroke consult through video

The TF discussed the challenges with the video consult process, including the need for a local clinician, typically the bedside nurse, to assist the telestroke provider in assessing the NIHSS. Among spoke sites, there exists large variability in confidence and competence in performing the NIHSS in the telestroke setting. An important distinction during a telestroke video exam is that the scoring is often completed and documented by the telestroke provider. Making this clear to those at the spoke site is an important characteristic in the process. The nurse should be confident in the assessment components of the NIHSS, particularly visual fields, limb ataxia, sensation, and extinction and inattention, which are often performed incorrectly. Additionally, spoke sites should incorporate annual NIHSS training with teach-back to increase overall NIHSS use in addition to maximizing fidelity to the protocol. To aid in this training, with a focus on the aforementioned assessment components, a demonstration video was developed, which is available as an open-source resource: NIHSS Training.

Treatment and transfer process

With respect to the treatment and transfer process, the TF identified barriers that can adversely impact patient outcomes, including:

- Delays in thrombolytic mixing.
- Hospitals at capacity and have difficulty in accepting IV thrombolytic patients.
- Delays in actual transfer after transfer decision made.
- Difficulty in finding ground transport, or EMS with qualified personnel to transport.

Delays in thrombolytic administration were identified as a hindrance towards reducing stroke impact and were addressed as part of the TF's efforts. Identifying staff member(s) and their role(s) in the mixing process, once the recommendation is given to administer IV thrombolytics (Alteplase or Tenecteplase), was determined to be critical to meeting an optimal treatment time. It is recommended to collaborate with the pharmacy department to develop reconstitution guidelines and protocols. For review, Genentech has Reconstituting Guidelines for Activase® (alteplase). There are also publicly available resources, including videos on YouTube and other sites, containing demonstrations of the reconstitution of IV thrombolytics. The TF recognized the

importance of performing annual competency training for mixing IV thrombolytics. The Wisconsin Hospital Association provides an example of a hospital's IV Alteplase competency (Aspirus Langlade).

The TF partnered with the Wisconsin Department of Health Services (DHS) EMS Section to discuss ground transport challenges, as well as finding qualified personnel to transport stroke patients. Coverdell has met with statewide EMS partners to address these transport and personnel issues and will continue to keep this communication open as a bridge between hospitals and EMS. While improving ground transport availability requires significant resources, many of which are not under local control, hospitals involved in this Telestroke Taskforce identified promising practices they could incorporate to mitigate this resource-dependent impact:

Education

- Establish a protocol illustrating not every stroke needs to be transferred as urgently as a large vessel occlusion (LVO)
- Ensure education on LVO scales and diversion among EMS and hospitals is provided to establish an understanding that a Code LVO is on the same level as a Code ST-elevation myocardial infarction (STEMI), and should be treated with the same urgency

Process and practice

- Call ground EMS or air transport early in the process (prior to imaging) and have on stand-by
- Establish processes to ensure EMS time and other resources are used efficiently
- Track internal quality metrics (including inter-facility transfer) to ensure processes are supporting expedited patient transfer practices

Structural

- If possible, pursue regionalization of care to streamline transfer opportunities and communication
- Investigate the possibility of contracting with a private transport agency

There have been recent resources addressing the door-in door-out (DIDO) time of acute stroke patients. One of these is AHA's Door-in-Door Out Best Practice Strategies, developed by the Western States Task Force. A second resource, titled Massachusetts Acute Stroke: Idealized DIDO Protocol can be found on the American Heart Association's Target: Stroke Clinical Tools and Resources webpage.

Successes in treatment and transfer were determined by the TF while developing this document. These are available in the Framework (see Appendix 2).

Feedback

Communication between hub and spoke hospitals is essential in building a telestroke network. It is beneficial for these two entities to develop a trusting working relationship. Spoke hospitals must vigilantly collect work-flow times and metrics of the acute stroke patient to assess their processes. Hub hospitals should share data results on individual or median times to stroke care with the spokes on, at least, a quarterly basis. This level of interactive communication will help assure patients receive the best care.

Get With The Guidelines® (GWTG)-Stroke is an online continuous quality improvement AHA stroke data registry. Stroke programs utilize GWTG-Stroke for thorough and comprehensive stroke care data collection in order to identify areas for improvement. It is recommended that spokes move to collecting their stroke data in GWTG-Stroke, which provides easy-to-access hospital and comparison data. While GWTG does have a cost associated with it, there are agencies in Wisconsin that can assist with this. Please contact Kelsey McCauley, at Kelsey.mccauley@heart.org for more information.

GWTG has stroke collection platforms for all levels of stroke certification as well as developed telestroke measures that can be conveniently collected, analyzed, compared, and shared. These measures able to be entered into GWTG include:

- Time from decision to treat to thrombolytic administration
- Door to telestroke consultation request
- Door to telestroke provider (start of video session)
- Telestroke consultation done
- Telestroke consultation and thrombolytic therapy received
- Reasons for transfer to higher level of care
- Reasons for transfer to this facility
- Transfer status after telestroke consult

It is essential the hub hospital provides spoke hospitals with the following data: comparison of initial and final diagnoses to identify stroke mimics, and outcomes data, including length of stay, complications, and discharge disposition. This feedback assists in building the relationship and provides loop closure, learning, and celebratory opportunities for the spoke hospital. To aid in data transparency and sharing, *Mission: Lifeline Stroke Feedback Form* is available in GWTG for users, and contains the following time-based, valuable metrics that can be easily shared with spoke hospitals:

- EMS pre-notification to stroke team activated
- Referring hospital discharge to receiving hospital arrival
- Patient arrival to first NIHSS score performed
- Patient arrival to ED Physician assessment
- Stroke team activation to stroke team arrival

- Patient arrival to brain imaging initiated
- Patient arrival to IV alteplase initiated
- Patient arrival to first pass of a clot retrieval device

Patient satisfaction

Stroke certifying bodies include in their reviews hospitals' ability to measure stroke patients' satisfaction with the hospital experience. During the certification process, hospitals will be asked what they learned and implemented from this information. The TF recommends including patient satisfaction as part of the telestroke care evaluation process. Satisfaction with, and perception of providers, technology, speed of receiving care, and overall experience are items to collect from patients (Weschler, 2017). Our TF identified patient satisfaction as a component of stroke measurement to improve upon. While the body of work on patient satisfaction surveys is limited, there are resources available that the TF found useful and of interest. Specifically, an article published in Stroke Journal in January 2021 (Lyerly, 2021) examined patient feedback of a national telestroke system within the Veterans Health Administration. The patient questionnaire the authors used was provided as a supplement, and divides the questions into two topics: the telestroke experience and overall satisfaction (Lyerly, 2021). Also, Bellin Memorial Hospital has developed a questionnaire to assess the patient's experience with telestroke (see Appendix 4). Bellin Memorial includes these questions when performing follow-up phone calls with stroke patients. The TF reviewed these resources and decided on five questions that could be added to their site's GWTG customizable fields. All questions are answered on a Likert Scale (1=Strongly Disagree to 5=Strongly Agree).

- The reason for my examination by a teleneurologist was explained.
- The teleneurologist took time to listen to me and answer my questions.
- I understood the recommendations made by the teleneurologist.
- The teleneurologist was knowledgeable about my condition.
- My overall experience with teleneurology was positive.

NEXT STEPS

The TF will continue to meet quarterly to discuss the telestroke system in WI. We will update this toolkit with additional resources as they become available.

LIST OF ACRONYMS

AHA	American Heart Association
ASRH	Acute Stroke Ready Hospital
CDC	Centers for Disease Control and Prevention
Coverdell	Wisconsin Coverdell Stroke Program
CT	Computed Tomography
ED	Emergency Department
EMS	Emergency Medical Services
GWTG	Get With The Guidelines®
LVO	Large Vessel Occlusion
NIHSS	National Institutes of Health Stroke Scale
QI	Quality Improvement
RN	Registered Nurse
SSoC	Stroke Systems of Care
TF	Taskforce
WI	Wisconsin

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APPENDICES

Appendix 1: Charter

<table>
<tr><th colspan="2">AHA and Coverdell Project Charter: Telestroke QI Task Force</th></tr>
<tr><td>Mission:</td><td>To develop comprehensive telestroke care in Wisconsin by discussing and directly addressing the issues of spoke hospitals in providing time-sensitive stroke care (for example, protocols, door to needle times) based on best practices and guidelines</td></tr>
<tr><td>Vision:</td><td>Bring together hub PSC and CSC hospitals' stroke coordinators to discuss and share current and needed practices in the on-boarding of spoke hospitals</td></tr>
<tr><td>Goals:
(all WI hospitals)</td><td>Process:
By February 2022, finalize a Wisconsin Telestroke Toolkit available for dissemination and sharing on virtual platforms (for example, Coverdell website)
By June 2023, report significant improvement of process flow and engagement of Critical Access Hospital (CAH) and rural hospitals, compared to baseline (June 2021) as assessed by partner query
Outcomes:
Increase % of stroke patients who receive a telestroke consult by three percentage points (15.1%) in Q1 2023 compared to Q1 2021
Reduce median time to consult by 12 minutes (down to national median of 29 minutes) in Q1 2023 compared to Q1 2021
Increase Alteplase administration rate by one percentage point (16.7%) in Q1 2023 compared to Q1 2021
Reduce DIDO times to < 133 minutes (20%) in Q1 2023 compared to Q1 2021
Increase Mechanical Endovascular Reperfusion Therapy (MER) rate by 2 Percentage Points (10.1%) in Q1 2023 compared to Q1 2021</td></tr>
<tr><td>Project leads</td><td>Sue Abelt, Quality Improvement Manager, AHA
John Bowser, Director, Wisconsin Coverdell Stroke Program, DHS
Dot Bluma, Coverdell Stroke Project Specialist, MetaStar</td></tr>
<tr><td>Milestones</td><td><table><tr><th>Date</th><th>Activity</th></tr><tr><td>May 17, 2021</td><td>Distribute query to Task Force members to determine the current landscape of telestroke in WI</td></tr><tr><td>June 3, 2021</td><td>Project leads analyze query responses</td></tr><tr><td>September 31, 2021</td><td>Task Force Stroke Coordinators will meet with project leads at three to five 1-hour meetings to discuss query results, share best practices, and determine documents with content needing creation regarding on-boarding spoke hospitals</td></tr><tr><td>December 31, 2021</td><td>Project leads to create best practice toolkit and documents</td></tr><tr><td>February 2022</td><td>Task Force review of draft documents</td></tr></table></td></tr>
<tr><td>Measurement of success</td><td>Identify and document necessary elements for, and capabilities of, spoke hospitals to fully realize the benefits of telestroke care that can be referenced for hospitals looking to improve or begin a telestroke relationship
Improvement in WI outcome data: increase Mechanical Endovascular Reperfusion (MER) rate, Alteplase administration, drip and ship times, and decrease in mortality</td></tr>
<tr><td>Communication</td><td>Inform Stroke Coordinators of Wisconsin (SCOW) and Coverdell Learning Collaborative (CLC) of activities and progress of this Task Force
Publish best practice toolkit and documents to AHA and Coverdell website</td></tr>
<tr><td>Issues and constraints</td><td>Possible constraints:
Stroke coordinators' lack of resource time for query completion or meeting attendance
Project leads with competing priorities that could delay content writing</td></tr>
</table>

Appendix 2: Framework

Telestroke Task Force Topic Framework					
Before go-live date: Review and assist in creation of spoke hospital stroke protocol Have a back-up plan for equipment failures					
Process item	**Challenges**	**Practice successes**	**WI consensus criteria**	**WI consensus documents**	**GWTG measure**
Decision to call-identification of stroke	What stroke population to initiate the call	Every patient with s/s of stroke=patient meets code stroke criteria; TS consult takes place	Every patient with s/s of stroke=patient meets code stroke criteria; TS consult takes place	AHA and Coverdell to create a decision to call identification doc: Telestroke Consult criteria	Door to Telestroke Consultation request
	When to call before or after CT	Simultaneous process of going to Computed Tomography (CT) and making the TS consult call	Simultaneous process of going to CT and making the TS consult call Require CT/Computed Tomography Angiography (CTA) (if they have the capability)		
	Protocol not being followed Protocol communicated across disciplines	Rollout education to all affected disciplines (RN, MD, hospitalist) with clear expectations		Taped Q&A of Clinician panel (ED, hospitalist, neurologist) who are experts in telestroke	

Telestroke consult through video	RN unfamiliar or fearful with performing NIHSS on camera	Say what you are seeing Include NIHSS review in annual training with teach back	5" response time from call	Creation of short video of RN performing NIHSS	Door to Telestroke Provider (start of video session)
	Too many calls during decision making process • Several areas have to be touched for continuity to occur • A lot of moving parts, would like to automate some	ED clinician hear recommendations of TS Consult Electronically ping TS when return from CTA Activate-direct to video. TS stays on until all decisions made. One call TS to ED to "wrap-up" care			
	RN availability in small hospital	Delineation of rolls during stroke alert			
Treatment and transfer process	Door to CT	Promising new practice: those sites with no 24/7 CT tech-TS reviews case and assess pt. before CT is completed			
	Difficulty in finding ground transport, or EMS with qualified personnel to transport	IV Thrombolytics: Tenecteplase vs Alteplase Call EMS or FFL early (prior to imaging) and have on stand-by Work with your EMS so a Code STEMI is seen in the same light as a Code LVO Ensure EMS is not on-site long Work your process backwards from the goal time and focus on internal processes the hospital has control over (that is, aim for more aggressive times for DTN)			% Door to CT <= 25 min Telestroke consultation done Telestroke consultation and thrombolytic therapy received Transfer status after telestroke consult Time from decision to treat to thrombolytic administration Door-in-Door-Out Time
	Hospitals are at capacity and have difficulty in				

	accepting IV thrombolytic patients				at first hospital prior to transfer for acute therapy
	Delays with CTA being completed after IV thrombolytic begun	Reconstitute IV thrombolytic after head CT shows no hemorrhage			
	Delays in mixing	Develop process of who will mix once recommendation is given Provider can call pharmacy and request them to mix alteplase ahead of imaging results for a potential candidate. Pharmacy can initiate the mixing. Once the CT is resulted negative, the provider can then place the alteplase order, pharmacy then brings the calculated dose bedside.			
	Delays in transfer decision made to actual transfer	Break the process down to ID where the delays are Collect multiple times in the process beyond what GWTG collects Transparency of data			
Feedback	Data to HUB: o Who completes documentation o Metrics and information needed from spoke	Find a key person to collaborate with for data sharing		Create stroke alert log and data capture	
	Data to spoke o Very difficult to have capacity to do for all patients transferred to the hub	Use a step-approach and provide feedback initially to those receiving thrombolytic therapy Utilize the stroke feedback log in GWTG®			

Patient satisfaction	Few resources and guidance	Bellin Memorial Hospital questionnaire Provider communication and telepresence enhance veteran satisfaction with telestroke consultations-article supplement GWTG® new IRP will have 30 optional fields which will provide the opportunity to customize a few for patient satisfaction questions to be asked during f/u phone calls			

Appendix 3: Telestroke Consult Criteria

Telestroke Consult Criteria

Telestroke: the application of telemedicine in the evaluation of patients presenting with acute stroke, with the goal of improving access and delivery of care to stroke patients who are unable to be immediately treated by a local neurologist

The use of telestroke is meant to assist providers in delivering advanced therapies to acute stroke patients in an efficient and cost-effective manner to ensure access to all available treatments. Currently, a small percentage of eligible patients receive intravenous (IV) thrombolytics. Part of the reason for this sub-optimal care provision is due to the lack of available neurology expertise during the acute stroke phase, particularly in rural areas. Eligible stroke patients can receive intravenous thrombolytics within 4.5 hours of last known well (LKW), and mechanical thrombectomy within 24 hours of LKW.

Utilizing telestroke has many benefits including: quicker diagnoses, identifying patients requiring transfer to a higher level of care, increased use of appropriate thrombolytic therapies (IV and mechanical), improved management of intracerebral hemorrhage patients, and improved outcomes for those not treated with thrombolytics.

The American Heart Association and Wisconsin Coverdell Stroke Program formed a Task Force of Stroke Coordinators at leading hospital systems in Wisconsin with a mission to develop comprehensive telestroke care by discussing and directly addressing the issues of spoke hospitals in providing time-sensitive stroke care based on best practices and guidelines. The Task Force determined criteria for initiating a telestroke consult:

Telestroke Consult Criteria

If a patient is 18 years or older, acute onset, LKW within 24 hours, and has one or more of the following BEFAST criteria, a telestroke consult will be initiated:

- BALANCE: Sudden loss of coordination or balance
- EYES: Sudden change in vision
- FACE: Sudden weakness on one side of the face or facial droop
- ARM: Sudden arm or leg weakness or numbness
- SPEECH: Sudden slurred speech, trouble speaking, trouble understanding speech
- TERRIBLE HEADACHE: Sudden onset of a terrible headache

The Telestroke Task Force developed a timeline for the patient who meets telestroke criteria. As interpretation of imaging is a key component to determining treatment, the Task Force determined the call to the telestroke consult needs to occur simultaneously while the patient is being taken for brain imaging. The acute stroke-ready hospital certifying agencies of the Joint Commission and Det Norske Veritas guidelines require the telemedicine link to be initiated within 20 minutes of the emergency physician and/or acute stroke team determining it is necessary.

*Hospitals are encouraged to reduce door-to-needle times for eligible patients being treated with intravenous thrombolytics by establishing more aggressive goals.

References:

Schwamm, L. et al. (2009) A Review of the Evidence for the Use of Telemedicine
Within Stroke Systems of Care. Retrieved from: A Review of the Evidence for the Use of Telemedicine within Stroke Systems of Care | Stroke (ahajournals.org)

Weschler, L. et al. (2017). Telemedicine Quality and Outcomes in Stroke. Retrieved from Telemedicine Quality and Outcomes in Stroke: A Scientific Statement for Healthcare Professionals from the American Heart Association/American Stroke Association (ahajournals.org)

Appendix 4: Bellin Memorial Hospital, Telestroke Patient Satisfaction Form

It was easy for me to hear the teleneurologist.	1	2	3	4	5
It was easy for me to see the teleneurologist.	1	2	3	4	5
The teleneurologist took time to listen to me.	1	2	3	4	5
The teleneurologist took time to answer my questions.	1	2	3	4	5
The teleneurologist was knowledgeable about my condition	1	2	3	4	5
I understand the recommendations made by the teleneurologist.	1	2	3	4	5
I am confident with the quality of my care.	1	2	3	4	5
I feel comfortable using telemedicine in the future.	1	2	3	4	5
My overall experience with teleneurology was positive.	1	2	3	4	5
I prefer to use telemedicine instead of seeing a provider face-to-face.	1	2	3	4	5

Strongly Disagree Neutral Strongly Agree

I am a (circle one): Patient/Family Member Male/Female Age

Have you used telemedicine in the past? YES NO

Do you feel comfortable using telemedicine in the future? YES NO

What went well?

What can be improved?

Comments: