DIDO Performance Improvement Requirements

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LOUISIANA EMERGENCY RESPONSE NETWORK

What is DIDO?

- Door In-to-Door Out
- Arrival-to-Departure



Why do we care about DIDO?

• Every minute matters during a stroke due to large vessel occlusion (LVO)

Time frame	Neurons lost	Ages the brain by	
Every second	32,000	8.7 hours	
Every minute	1.9 million	3.1 weeks	
Every hour	120 million	3.6 years	
Every 10 hours*	1.2 billion	36 years	

What is the natural history of ischemic stroke due to LVO?

- mRS 3-6 more than double in LVO vs non-LVO patients
- 6-month mortality 26.2%
 vs 1.3%, P<0.0001.
- Even with IV lytic, <40% are independent at 90 days post stroke



Time from onset to start of thrombectomy and odds of improved functional outcome

A Odds ratio for less disability at 3 mo in endovascular thrombectomy vs medical therapy alone groups by time to treatment



Time from onset to start of thrombectomy and odds of improved functional outcome

Modified Rankin Scale



Thrombectomy 6 to 24 Hours after Stroke with a Mismatch between Deficit and Infarct

Type of stroke onset — no. (%)‡	Thrombectomy Group	Control Group
On awakening	67 (63)	47 (47)
Unwitnessed stroke	29 (27)	38 (38)
Witnessed stroke	11 (10)	14 (14)

Score on the Modified Rankin Scale

0 1 2	3 4	📕 5 or 6
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A Intention-to-Treat Population



Thrombectomy for Stroke at 6 to 16 Hours with Selection by Perfusion Imaging

Stroke onset witnessed — no. (%)	Endovascular Therapy	Medical Therapy
Yes <u>i</u>	31 (34)	35 (39)
No		
Symptoms were present on awakening	49 (53)	42 (47)
Symptoms began during wakefulness	12 (13)	13 (14)



2018 Guideline sections

Mechanical Thrombectomy

- Extended window:
 - In selected patients with AIS within 6 to 16 hours of last known normal who have LVO in the anterior circulation and meet other DAWN or DEFUSE 3 eligibility criteria, mechanical thrombectomy is recommended (Class I: LOE A)
 - In selected patients with AIS within 6 to 24 hours of last known normal who have LVO in the anterior circulation and meet other DAWN eligibility criteria, mechanical thrombectomy is reasonable (Class IIa: LOE B)



Louisiana Hospital Stroke Endovascular- Drive Time Polygons



2022 Drive Times to Comprehensive, Certified Thrombectomy, Primary Stroke w/Endovascular, Primary Stroke, and Acute Stroke Ready Hospitals

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LOUISIANA

EMERGENCY RESPONSE



	Q3 2020 data from ASRH ALL <24hrs from LSN N=771	Q4 2020 data from ASRH ALL <24hrs from LSN N=876	Q1/Q2 2021 data from ASRH ALL <24hrs from LSN N=1946	Q3/Q4 2021 data from ASRH ALL <24hrs from LSN N=1851
% arriving by ambulance	50.4%	48.8%	50.3%	48.1%
NIHSS, median (range), [IQR]	3 (0-41), [1-9] N=662 (85.9%) LVO+ 13.5 (0-37), [8-19], n=114 LVO- 3 (0-36), [0-6], n=465	3 (0-40), [1-9] N=761 (86.9%) LVO+ 12 (0-37), [7-20], n=137 LVO- 2 (0-33), [1-6], n=495	3 (0-42), [1-7] N=1653, 84.9% LVO+ 12 (0-39), [6-19] n=273 LVO- 2 (0-39), [1-5] n=1205	3 (0-42) [1-8] N=1614, 87.2% LVO+ 13 (0-42), [8-22] N=250 LVO- 2 (0-36), [0-5] n=1170
% screened for LVO	86.8%	85.0%	89.0%	90.0%
Method of LVO screening	VAN, 71.9% Other clinical, 4.4% Both clinical and vascular, 6.0% CTA, 15.8% Other vascular, 1.6%	VAN, 71.1% CTA, 17.0% Both clinical and vascular, 7.4% Other clinical, 2.5% Other vascular, 2.0%	VAN, 68.8% CTA, 15.1% Both clinical and vascular, 7.8% Other clinical, 6.2% Other vascular, 2.0%	VAN, 67.3% CTA 17.2% Both, 8.3% Other clinical 4.9% Other vascular 2.3%
% LVO screen positive	18.7% 115/615	21.5% 144/669	18.1% 288/1591	17.2% 259/1509
Door in-transfer request, median (range), [IQR] minutes	56 (6-260) [37-114] N=72	59 (13-420) [37-92] N=96	58 (7-1191) [38-103] N=188	63 (0-1263) [42-96] N=134
Transfer request- departure, median (range), [IQR] minutes	54 (5-385) [43-88] N=70	57 (10-398) [39-97] N=99	66 (10-889) [49-97] N=190	80 (10-785) [56-142] N=132
Door in-door out time, median (range), [IQR] minutes	113 (36-481) [95-181] N=70	119 (55-501) [95-174] N=101 22% of transfers <90min	141 (33-1279) [99-210] N=193	157 (32-1350) [120- 225] N=144 9.7% of transfers <90min

Q3 2020 data from ASRH	Q4 2020 data from ASRH	Q1/Q2 2021 data from ASRH	Q3/Q4 2021 data from ASRH
ALL <24hrs from LSN	ALL <24hrs from LSN	ALL <24hrs from LSN	ALL <24hrs from LSN
N=771	N=876	N=1946	N=1851
DIDO delays due to: Secondary transfer = 3 Getting accepted/bed = 11 Not ELVO = 12 Delayed dx = 1 Delay in request = 2 Refused = 5	Reasons LVO+ patients not transferred 24/37: No LVO = 1 No penumbra = 2 Not a candidate = 9 No significant deficit = 4 Refused = 3 Unstable = 1 Hemorrhagic changes = 1 MER on site = 3 DIDO delays due to: Secondary transfer = 8 Getting accepted = 17 Patient unstable = 3 Delay in request (patient) = 5 Delay in request (facility) = 1 Delayed diagnosis = 1 Telestroke = 1	Reasons LVO+ patients not transferred: No reason = 58 No LVO = 5 Mimic = 4 No penumbra = 0 Not a candidate = 7 No significant deficit = 4 Refused = 8 Unstable = 2 Hemorrhagic changes = 2 MER on site = 3 DIDO delays due to: Secondary transfer = 23 Getting accepted = 43 Patient unstable = 3 Delay in request (patient) = 2 Delay in request (facility) = 4 Delayed diagnosis = 3 Not emergent = 4 Other = 1	

	Q3 2020 data from PSC ALL <24hrs from LSN All LVO screen + N=47	Q4 2020 data from PSC ALL <24hrs from LSN and LVO screen + N=46	Q1/Q2 2021 data from PSC ALL <24hrs from LSN and LVO screen + N=109	Q3/Q4 2021 data from PSC ALL <24hrs from LSN & LVO screen+ N=107
% arriving by ambulance	81.4% 35/43	71.1% 32/45	77.1% 84/109	79.0% 83/105
NIHSS, median (range), [IQR]	14 (0-31), [7-18] 47/47	10 (0-36), [4-17] 45/46	13 (0-40), [8-20] 109/109, 100%	14 (0-37), [6-20] 104/107, 97.2%
% screened for LVO	100%	100%	100%	100%
Method of LVO screening	Not required of PSCs	Not required of PSCs	Not required of PSCs	Not required of PSCs
% LVO screen positive	100%	76.1% transferred 35/46	100%	100%
Door in-transfer request, median (range), [IQR] minutes	43 (6-241), [28-68] 39/42	47 (13-183), [39-83] 34/35	52 (7-591), [30-100] 103/109	56 (9-632), [30-101] 94/94
Transfer request- departure, median (range), [IQR] minutes	62 (23-176), [50-80] 39/42	57 (27-214), [48-87] 34/35	59 (13-834), [43-94] 102/109	67 (13-232), [46-87] 94/94
Door in-door out time, median (range), [IQR] minutes	112 (58-340), [84-142] 42/42	117 (66-298), [95-175] 35/35	124 (55-1134), [87-196] 105/109	125 (55-701), [92- 165] 94/94 20.2% of transfers <90min

Q3 2020 data from PSC	Q4 2020 data from PSC	Q1/Q2 2021 data from PSC	Q3/Q4 2021 data from PSC
ALL <24hrs from LSN	ALL <24hrs from LSN and	ALL <24hrs from LSN and	ALL <24hrs from LSN & LVO
All LVO screen +	LVO screen +	LVO screen +	screen+
N=47	N=46	N=109	N=107
DIDO delays due to: Secondary transfer = 8 Getting accepted/bed = 4 Pt unstable = 1 Delayed dx = 2 Delay in request = 3 COVID test = 1 Delay in report at accepting = 2	Reasons LVO+ patients not transferred: No LVO = 4 No penumbra = 2 No significant deficit = 3 No acute stroke = 2 DIDO delays due to: Receiving report = 1 Secondary transfer = 7 CTA = 1 Delayed dx = 4 Delay in request, patient factor = 1 Delay in imaging = 1 Other = 5	Reasons LVO+ patients not transferred: Not candidate = 1 Chronic occlusion = 1 Comfort care = 1 DIDO delays due to: Secondary transfer ambulance = 10 Delay in finding accepting = 18 Delayed dx = 8 Delay in request facility factor = 2 Delay in request facility factor = 4 Patient unstable = 6 Delay with EMS on site = 3	





- Target Door in-Door out Times: goal of ≤90 minutes in ≥50% of transferred patients
- Rapid administration of IV thrombolysis
- Rapid initiation of transfer process
- Participate in a regional System of Care
- Use of telemedicine
- Rapid acquisition, interpretation, and transmission of neuroimaging
- Expedited transport handoff
- Mock code strokes
- Prompt data collection, feedback, and quality improvement

DIDO Performance Improvement

- Required of all ASRH, PSC, and PSC-E without 24/7 coverage
- Effective July 1, 2022 start of Q3 2022
- DIDO applies to patients who:

- present within 24hrs of LSN (wake-up or discovered)
 AND
- screen positive for LVO (clinical and/or imaging)
 AND
- transferred for potential thrombectomy

Which patients get entered into the spreadsheet?

ASRH

- All patients who present to your ED with suspected stroke
- DIDO data elements are only for patients who present within 24hrs (or could be within 24hrs of LSN)

PSC

 Patients who present within 24hrs (or could be within 24hrs of LSN)

AND

 Screened positive for LVO

Hospital Identifier	Quarter Format: Q- YY e.g., 3-18	Date	Patient ID #	Last Seen Normal (Military Time)	Arrival Time at Door (Military Time)
	3-22	07/01/22	-3-22-001		
	3-22		-3-22-002		

Hospital Identifier was assigned by LERN. Do not substitute anything else. If you start with a fresh spreadsheet each quarter, the column will auto-populate after you enter your Hospital Identifier in the first row.

Quarter Format should be Q-YY. Do not add a 0 before the quarter. Do not 20 before the year.

Date of Arrival. Date Format should be MM/DD/YY. The first day of 3-22 would be 07/01/22. A zero should precede single digit number months and days. - PSCs

The patient ID# is the Hospital Identifier-Q-YY-001. Once you introduce your Hospital Identifer to the Column A, Row 5, your patient ID#s should auto-populate.

Hospital Identifier	Quarter Format: Q- YY e.g., 3-18	Date	Patient ID #	Last Seen Normal (Military Time)	Arrival Time at Door (Military Time)
	3-22	07/01/22	-3-22-001		
	3-22		-3-22-002		

- Last Seen Normal (LSN) is the time, in 24-hour military format, that the patient was last known to be at his or her normal neurological condition.
- LSN time is the same as time of onset for a person who was awake at onset and can provide his or her own history and for a person with a witnessed onset.
- If the stroke onset was not witnessed and the patient is unable to provide the time of onset, the LSN is the last time the patient was seen in his/her normal state.
- If the LSN time is known, enter that time in military format (e.g., 1:35pm would be 13:35).
 - Do not simply enter <3.5 hours; please enter the time
 - If the precise time is not known, please estimate and enter that estimate; for example, if the LSN is "1 hour before arrival" and the arrival was 13:35, enter 12:35 as the LSN.

Hospital Identifier	Quarter Format: Q- YY e.g., 3-18	Date	Patient ID #	Last Seen Normal (Military Time)	Arrival Time at Door (Military Time)
	3-22	07/01/22	-3-22-001		
	3-22		-3-22-002		

- If the LSN time is between 3.5 hours and 24 hours, enter ">3.5 hours" or military time. Do not make up your own categories (>3 hours, >4 hours, >12 hours, etc)
- If the LSN time is >24 hours, enter ">24 hours".
- If the LSN time is unknown and cannot be estimated, leave the cell blank.
- If the LSN date is before the arrival date and the patient arrives less than 3 hours after LSN, the earlier date will be assumed.
 - For example, if the patient was LSN at 22:00 on 07/02/19 and arrives at 00:20 on 07/03/19, it will be assumed that the patient arrived 2 hours and 20 minutes after LSN on the date 1. If the LSN was 22:00 on 07/03/19, >3.5 hours should have been entered instead of a time.
- If the onset of symptoms occurred while in the ED (whether for TIA or for unrelated symptoms), the LSN time after Arrival time will be noted.

Hospital Identifier	Quarter Format: Q- YY e.g., 3-18	Date	Patient ID #	Last Seen Normal (Military Time)	Arrival Time at Door (Military Time)
	3-22	07/01/22	-3-22-001		
	3-22		-3-22-002		

- Arrival Time at Door is the time (military time) that the patient was first acknowledged as being present.
 - If the patient arrives by ambulance, this is the time the ambulance arrives.
 - If the patient arrives by private vehicle or as a walk-in, this is the time stamp on the ED triage form.
- Arrival Time at Door should be documented for all patients who present within the first 24 hours of LSN.
- This timestamp may be left blank for patients arriving >24 hours from LSN.

Mode of Arrival

- A drop-down menu allows for selection of private vehicle, ambulance, air ambulance, and unknown.
- Hospitals with a higher proportion of patients arriving via private vehicle are more vulnerable to delays in evaluation and management.
 EMS prehospital notification increases the odds of receiving treatment and is associated with shorter door-to-needle time.
 - In Q3/Q4, a patient arriving to a PSC was 4x more likely to arrive via ambulance than a patient arriving to an ASRH (OR 4.074, 95% CI 2.524-6.575, p<0.001).
 - ASRH have significantly lower % arriving by ambulance. ASRH are more likely to be rural. Mode of arrival likely contributes to the geographical disparity in stroke outcomes in rural areas.
- Stroke educational initiatives can be better targeted

NIHSS total score

- The NIHSS exam should be performed by certified examiners on all patients with suspected stroke based on 2018 AHA Guidelines for the Emergency Management of Patients with Acute Ischemic Stroke.
- The NIHSS score will permit a more granular level interpretation of stroke code and transfer efficiency based on stroke severity.

Patient screened for LVO?

- Because only patients who screened positive for LVO are included in PSC datasets, <u>this column is not part of</u> <u>the PSC spreadsheet</u>.
- ASRH should select, from the drop down options, Yes, No, or Not applicable.
- If NIHSS was performed, the answer should be Yes, because the components of the NIHSS exam can be used to determine VAN (upper extremity motor >0, gaze, visual fields, language, and neglect).
- Not applicable is acceptable for patients whose deficits have resolved (TIA), ICH on imaging, or determined stroke mimic.

If yes (screened for LVO), what method?

- A drop-down menu of check boxes allows for multiple choices including VAN (Visual, Aphasia, Neglect assessment), CT Angiography (CTA), other clinical scale or score (RACE, FAST-ED, CPSS, total NIHSS), and other vascular imaging (MRA, TCD, and/or angiography).
- If screening was not performed, leave blank.
- this column is not part of the PSC spreadsheet

Result of LVO screening?

- A drop-down menu of choices LVO Positive and LVO Negative.
 - Do not create your own variables (VAN Positive/VAN Negative).
- If screening was not performed, leave blank.
- this column is not part of the PSC spreadsheet

DIDO Performance Improvement

- If a patient presents within 24 hours of LSN and screens positive on clinical test (such as VAN), but then has vascular imaging that does NOT support LVO:
 - the result of LVO screening should be "negative"
 - do not provide times for transfer

- If a patient presents within 24 hours of LSN and screens positive for LVO (clinical and/or imaging), but has been ruled out for thrombectomy:
 - do not include times for transfer
 - do include a comment indicating the patient was not transferred for thrombectomy and why ("not a candidate for thrombectomy due to large completed stroke", for example).

Decision Time

- This the time the decision was made for or against emergent transfer for possible thrombectomy <u>for a patient who screened</u> <u>positive for LVO</u>.
 - We want to know how long it took for your site to decide that the patient needed to be transferred. Ideally, this is within minutes of arrival.
- If the patient screened negative for LVO, leave blank (ASRH), even if the patient was transferred for higher level of care.
- If the decision was made for transfer for possible thrombectomy, you need to document the time of transfer request, acceptance and the time of transfer/departure/door out.
- If the decision was made against transfer for possible thrombectomy, do not include the time of acceptance or time of transfer/departure/door out, even if transferred, and include the reason the patient was determined to not be a candidate for thrombectomy in the Details Column.

Transfer Request Time

- Enter the time of transfer request, ideally within minutes of the decision time, for patients who screened positive for LVO and were presumed to be candidates for thrombectomy.
 - We want to know how long it took from the time you decided the patient needed to be transferred until the time you initiated that process. Ideally, this is within a minute or two of the decision time.
- If your site does not have a consistent method for source documentation of the time of transfer request, then this is a target for process improvement.

Acceptance Time

- This is the time the thrombectomy center accepted transfer of the patient.
 - We want to know how long your site had to wait until you had an acceptance for the patient.
- If the LERN Communication Center was used to facilitate acceptance, please indicate this in the Details Column.
- If it took so long to get accepted, that the patient was no longer transferred with the intent of offering thrombectomy, leave this blank and indicate the patient could not be transferred in time for thrombectomy in the Details Column.

EMS on Scene Time

- This variable is required only for sites who are active in the remediation process for DIDO.
 - For all sites for whom collection of this variable does not impose a burden, please include in your spreadsheet.
- This is the time that the secondary transfer EMS ground or air ambulance arrived to transfer the patient for thrombectomy to a thrombectomy center.
 - We want to know how long from acceptance to arrival of EMS it took.
 - We want to know how long it took for EMS to get the patient out of your ED.
 - One of the potential contributors to prolonged DIDO (and target for performance improvement) is poor efficiency of handoff between ED and EMS providers.

Transfer Time

- = Door Out
- = Departure Time
- This is the time that the patient physically leaves your ED, en route to the thrombectomy center.
- Transfer Time is necessary to calculate the Door Into-Door Out/DIDO interval.

Reason for Transfer Delay

A drop-down check box allows for multiple choices for:

- $\circ~$ delay in request patient factor
 - Something was going on with the patient which led to delay in seeking transfer for thrombectomy, such as patient unstable, delay in acquiring head CT scan because the patient was agitated, delay in patient/family agreeing to transfer
- \circ delay in request facility factor
 - Your facility requested transfer late due to delayed diagnosis of stroke, delay in ability to perform requested diagnostic imaging, or poor communication among staff
- $\circ~$ delay in recognition of LVO
- delay in finding accepting center
- o delay in arrival of interhospital ambulance
- o other (please include details in Details Column)

Details Column

- This is a free text cell which allows you to provide any information you think is helpful in understanding what happened.
- If a patient presents within 24 hours of LSN and screens positive for LVO (clinical and/or imaging), but has been ruled out for thrombectomy, please document why the patient is not being transferred for thrombectomy
 - LVO not accessible/distal
 - LVO chronic
 - deficits too mild
 - completed stroke
 - lack of penumbra
 - improved with IV lytic
 - patient not a good candidate due to age, pre-existing disability, goals of care, etc
 - took too long to get accepted to a thrombectomy center

Who needs to enter the remediation process?

 If a hospital (ASRH or PSC) has a median DIDO exceeding 90 minutes AND the upper end of the IQR (in the highest 25% of centers), that hospital will enter the remediation process.

ASRH

	Q3/Q4 2021 data from ASRH ALL <24hrs from LSN N=1851		Q3/Q4 2021 data from PSC ALL <24hrs from LSN & LVO screen+ N=107
Door in-door out time,	157 (32-1350)	Door in-door ou	125 (55-701)
median (range), [IQR]	[120 <mark>-225</mark>]	median (range),	[IQR] [92-165]
minutes	N=144	minutes	94/94

PSC

What's involved in the remediation process?

- Submit an Action Plan, no later than the deadline for submission of data in the following quarter, which details how the processes will be modified in order to reach the target.
- Hospitals entering the remediation process for DIDO will be required, regardless of patient volume, to perform mock stroke codes utilizing the AHA/ASA stroke scenarios #2 and #3 (suspected LVO scenarios) on a quarterly basis and submit the documentation along with the quarterly data.
 - The intent of the mock stroke codes is to work through barriers to rapid identification and transfer of patients with emergent LVO to centers with thrombectomy capability.

Who is going to know that your site is in the remediation process?

- The requirement for participation in the remediation process will not be known by anyone other than the <u>Stroke</u> <u>Medical Director and key LERN administration</u> at this stage.
- The hub will be notified only if remediation fails to achieve the target within two quarters.

What happens if the remediation process does not yield results?

- If an ASRH or PSC cannot meet the target DIDO within 2 quarters of receipt of the Action Plan, the hospital will receive an on-site visit by LERN's Stroke Medical Director OR the center's hub (whichever the <u>hub</u> prefers, after review of spoke performance), within 90 days of the center's continued demonstration of inability to meet the Phase 1 target DIDO.
 - For example, if Q3 2022 report requires Action Plan, to be submitted by January 31, 2023, with Q4 2022 data, the center will have until Q2 2023 to meet the Phase 1 target DIDO. If not achieved by Q2 2023, a site visit will occur by the end of Q3 2023.
- The site visit will review the center's processes for evaluating patients who present by private vehicle and ambulance with suspected stroke, up to 24 hours from last seen normal, focusing on methods of LVO screening and the process for identifying the need for transfer of suspected LVO patients.

Who needs to enter the remediation process?

- If a hospital (ASRH or PSC) has a median DIDO exceeding 90 minutes AND the upper end of the IQR (in the highest 25% of centers), that hospital will enter the remediation process. submit an Action Plan, no later than the deadline for submission of data in the following quarter, which details how the processes will be modified in order to reach the target.
- The requirement for participation in the remediation process will not be known by anyone other than the Stroke Medical Director and key LERN administration at this stage (the hub will be notified only if remediation fails to achieve the target within two quarters).
- Hospitals entering the remediation process for DIDO will be required, regardless
 of patient volume, to perform mock stroke codes utilizing the AHA/ASA stroke
 scenarios #2 and #3 (suspected LVO scenarios) on a quarterly basis and submit
 the documentation along with the quarterly data.
 - The intent of the mock stroke codes is to work through barriers to rapid identification and transfer of patients with emergent LVO to centers with thrombectomy capability.

DIDO performance feedback

- 1. The hub and spokes will receive feedback on DIDO performance over time.
- 2. The remediation process will be re-evaluated over time and modified, as needed, to help ASRH and PSCs reach the goals for acute stroke care.
- Only biannually aggregated ASRH or PSC data, will be presented to individuals other than Stroke Medical Director, key LERN administration, and hub representative.
- 4. Hospitals failing to meet the target DIDO will not have a consequence such as demotion, as may occur in ASRH who cannot reach targets. The status of ASRHs and PSCs will not be influenced by the proposed remediation process.

Questions??

