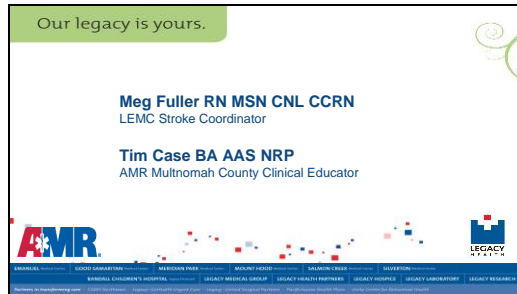


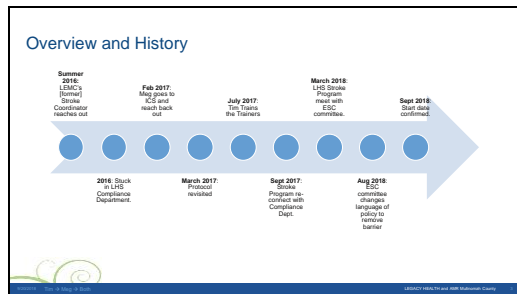
Slide 1



Slide 2



Slide 3



Slide 4

Overview and History

- What task are we trying to accomplish?
 - Get patient to definitive care faster
 - Smaller community / outlying hospitals :: reduced capability
 - Definitive care at CSC
 - Initiation of life saving interventions (definitive care) earlier in course of illness.

TIME IS BRAIN!

Slide 5

AHA/ASA 2018 Guidelines: Early thrombectomy

| | | |
|---|----|------|
| 3. Patients should receive mechanical thrombectomy with a stent retriever if they meet all the following criteria: (1) penstroke mRS score of 0 to 1; (2) causative occlusion of the internal carotid artery or MCA segment 1 (M1); (3) age ≥ 18 years; (4) NIHSS score of ≥ 6 ; (5) ASPECTS of ≥ 6 ; and (6) treatment can be initiated (groin puncture) within 6 hours of symptom onset. | I | A |
| 4. Although the benefits are uncertain, the use of mechanical thrombectomy with stent retrievers may be reasonable for carefully selected patients with AIS in whom treatment can be initiated (groin puncture) within 6 hours of symptom onset and who have causative occlusion of the MCA segment 2 (M2) or MCA segment 3 (M3) portion of the MCAs. | Ib | B-R |
| 5. Although the benefits are uncertain, the use of mechanical thrombectomy with stent retrievers may be reasonable for carefully selected patients with AIS in whom treatment can be initiated (groin puncture) within 6 hours of symptom onset and who have causative occlusion of the anterior cerebral arteries, vertebral arteries, basilar artery, or posterior cerebral arteries. | Ib | C-ED |

Slide 6

System Considerations

- Adequate Training
 - Multiple realms in medicine coinciding
 - All need to know capabilities of the other
 - Education consistent with current guidelines and accepted hospital practice
- Protocol Compliance
 - Unforeseen system issues
 - How to measure process outcomes
 - Chart review
 - Data points
 - DIDO
 - Initial door (sending) in to thrombectomy
 - Average travel time
 - Is there measurable improvement with this process vs. previous
 - Are patients being treated faster?

Slide 10

Hospital Consideration – Addressing Concerns

- **Sending RN leadership:**
 - > Current language of Legacy's Transfer of Critical Care Patient policy needed revision
 - Refocus that language did not impact this project
 - Legacy's policy wording addressed
 - > Assure that RN would not be in violation of EMTALA if handing care over to EMS
 - Added EMS' scope to transfer policy.

KEY POINT: AMR in Multnomah and Clatsop counties can continue an Alteplase infusion, draw a neurolytic infusion which has already been initiated, and give labetalol IV without a RN for Acute Ischemic Stroke patients

- **Sending MDs:**
 - > Ownership vs Connecting EMS with best provider to address needs not addressed in protocol
 - Legal (EMTALA), expertise, practical
- **Clinical Practice Support:**
 - > Sending a nurse concerns
 - Refocus scope of project
 - > Concerns often raised related to the general safety of transferring patient
 - Refocus to if a RN was there, what would they do differently than a trained paramedic?

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Hospital Consideration – Addressing Concerns cont.

- **Compliance department:**
 - > Sending MD to send Paramedic with orders
 - Overturned by Legal and ESC
 - > Sending MD to have working knowledge of EMS protocols
 - Overturned by Legal and ESC
 - > Sending RN to know training of EMS
 - Written into Legacy's Transfer of Critical Care Patient policy
- **Legal department:**
 - > Can Paramedics even follow orders written by hospital MDs?
 - Rewriting Legacy's policy made this a moot point.

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EMS Considerations

- **Protocol development**
 - > Who should be involved
 - Neurology
 - ED staff (MDs/RNs/mgmt.)
 - EMS Medical Director
 - Field Providers
 - Legal
 - > Multi-disciplinary approach
 - > Need consensus
 - > Protocol + training
 - > Easy to adopt by other Health Care systems
- **Overall mission**
 - > Get patient to definitive care. TIME IS BRAIN

Slide 13

EMS Considerations

- Training
 - > New elements to already robust system
 - New medications
 - Alteplase
 - Nicardipine
 - labetalol
 - Pump operations
 - Facility pump
 - Receiving and hand-off nuances
 - Timestamp of alteplase / flush
 - Going directly to cath
 - Who to call when "things get sideways"
 - OUMC

Slide 14

AMR Multnomah County Alteplase Protocol

- Ostensibly a two part protocol
 - > Medication page
 - > Protocol page
- Used current best practice recommendations and health system guidelines
- Lives outside system protocols
 - > IFT
 - > Transport agency only

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AMR Multnomah County Alteplase Protocol

- **PURPOSE:**
 - > Monitoring and assessments while transferring a patient with an acute stroke who has alteplase (tPA) infusing during interfacility transfer.
- **SCOPE:**
 - > AMR transports between Legacy Health facilities
- **Patient Assessment**
 - > Continuous cardiac monitoring
 - > Alteplase runs through a dedicated IV site. No other medications should be given through this site.
 - > Vital signs should be assessed every 5 minutes
 - Goal is SBP under 180 mmHg and DBP under 105 mmHg
 - Goal oxygen saturation above 94%

Slide 16

AMR Multnomah County Alteplase Protocol

- **Patient Assessment (con't)**
 - > Assess the following every 15 minutes or when any change occurs:
 - GCS
 - Dysarthria
 - Pupil size and reaction
 - Dysphasia
 - Lateral gaze
 - Movement of each extremity
 - Facial droop
 - Original deficit
 - > Constant surveillance for an adverse effect of alteplase (IPA):
 - Angioedema
 - Signs of intracranial hemorrhage
 - A spike in blood pressure
 - Vomiting with neuro changes
 - New severe headache
 - Decreased LOC
 - Sudden worsening of neurological exam
 - Signs of severe and uncontrolled hemorrhage
 - Sudden, increased HR and markedly lower BP
 - Sudden abdominal or flank pain




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AMR Multnomah County Alteplase Protocol

- **Treatment**
 - > Position patient on gurney with head of gurney less than 30 degrees as tolerated
 - > Maintain alteplase (IPA) infusion (initiated by hospital)
 - alteplase (ACTIVASE) injection 0.81 mg/kg, intravenous, over 60 Minutes.
 - Vial should have exact dose.
 - Max dose 81mg.
 - > Monitor of adverse effects of alteplase (IPA):
 - **STOP** alteplase (IPA) infusion and call OLMC for additional orders if any adverse effects (see above) develop.
 - Patient will no longer be direct to Cath Lab.
 - Notify receiving facility's Emergency Department.
 - Bring pt to receiving facilities Emergency Department.
 - > As soon as alteplase (IPA) bottle is empty, remove the bottle and spike a normal saline bag. Continue infusion at the same infusion rate until the pump indicates "volume to be infused complete".
 - Document the time you removed the alteplase (IPA) bottle, the rate of the normal saline flush (same as alteplase (IPA) infusion), and the time the pump indicated "volume to be infused complete".




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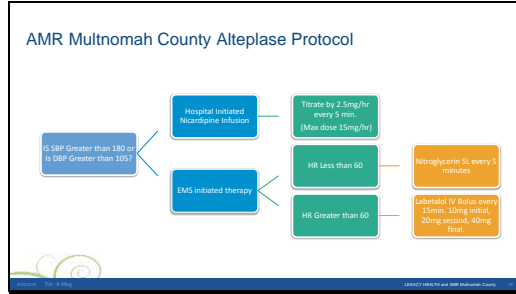
AMR Multnomah County Alteplase Protocol

- **BLOOD PRESSURE CONTROL**
 - > Attempt to maintain blood pressure SBP less than 180 mmHG and Diastolic less than 105 mmHg by **ONLY one** of the following methods:
 - IV Nicardipine (hospital initiated)
 - Titrate by 2.5 mg/hr every 5 minutes
 - Maximum dose of 15 mg/hr
 - Maintain SBP between 140 mmHg & 160 mmHg
 - Labetalol (EMS initiated) – If HR greater than 60 bpm
 - Administer labetalol 10 mg IV
 - May be repeated twice (3 total doses) every 15 minutes if BP not within target range (depending on effect of preceding doses, double remaining doses; eg. 1st dose is 10mg, 2nd dose is 20mg, 3rd dose is 40mg).
 - Stop administration if HR less than 60 bpm or other adverse effects
 - Maximum total dose is 30 mg
 - Formulation 4 mL (5 mg/mL, total 20 mg) Carpuject Sterile cartridge
 - Do not administer through same IV site as alteplase.
 - Nitroglycerin (EMS initiated) – If HR less than 60 bpm
 - Administer one (1) tablet SL
 - May be repeated every 5 minutes as needed



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AMR Clark/Cowlitz County Stroke Patient who is receiving or has received IV Alteplase Protocol

Stroke Patient who is receiving or has received IV t-PA

Transferring hospital to provide the following information to EMS:

- Date and time patient was last known normal
- Family contact information (name, relationship, phone)
- t-PA information:
bolus dose/time infusion dose / start time / end time (if complete)

Before departure from transferring hospital:

- Document F.A.S.T. findings, GCS and Vital Signs.
- Transferring hospital to stabilize BP prior to transport. Verify BP < 180/105 OR BP > 90 systolic.

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AMR Clark/Cowlitz County Stroke Patient who is receiving or has received IV Alteplase Protocol

During transport:

- Continuous cardiac monitoring
- Continuous pulse oximetry – SpO2 between 94% and 99%, ETCO2 35-40
- Monitor and document VS and neuro checks q 15 minutes. Keep patient NPO
- HOB to remain < 30 degrees unless otherwise directed by transferring facility
- t-PA infusion completion:
 - o When t-PA bottle is empty, replace with 50mL bag of NS (same tubing as t-PA) until IV pump indicates infusion complete, then continue at TKO rate or saline lock IV.
 - o Monitor for adverse effects of t-PA. For the following symptoms, **discontinue infusion immediately** and contact receiving facility for further instructions:
 - o Acute intracerebral hemorrhage (sudden severe HA, decreased LOC, acute HTN, etc.)
 - o Angioedema /allergic reaction.
 - o Serious bleeding (e.g., hematemesis, flank pain suggestive of retroperitoneal bleed, etc.)
 - o Sudden hypotension, BP < 80 systolic

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AMR Clark/Cowlitz County Stroke Patient who is receiving or has received IV Alteplase Protocol

Blood Pressure management during transport: (goal SBP < 180 mmHg and DBP < 105 mmHg)

- If SBP exceeds 180 mmHg or DBP exceeds 105 mmHg, **contact Medical Control at PHSW Medical Center for guidance.** Treatment may include the following:
 - **Labetalol** 10 mg IV push over 2 minutes. May repeat as directed every 10-15 minutes to reduce BP to within goal range. (Maximum total dose of 300 mg.) Hold for HR < 60.
 - If **Labetalol infusion** was started at transferring facility, increase by 1mg/min every 10 minutes as needed to maximum of 8 mg/min to maintain BP < 180/105. If SBP < 140 or HR < 60, turn off infusion and contact facility for further instructions.
 - If **Nicardipine infusion** was started at transferring hospital, increase dose by 2.5 mg/hr if needed every 5 minutes to maximum of 15 mg/hr until BP < 180/105. If SBP < 140, turn off infusion and contact receiving facility for further instructions.
- If patient develops hypotension (SBP < 80) begin dopamine drip at 10 mcg/kg/hour per protocol. Discontinue IPA drip if still infusing.
- Manage Angioedema as per allergic/anaphylactic protocol. Epinephrine drip at 2-4 mcg/min preferred over IM epinephrine.

Slide 23

Training

| EMS | Hospital |
|---|--|
| <ul style="list-style-type: none"> • Train the Trainer Model <ul style="list-style-type: none"> ○ FTO group • Hands on with Legacy pump • Video based component ☉ Titrating Nicardipine | <ul style="list-style-type: none"> • 6 hospitals + system office • Site-based education • 3 weeks of education before Go-Live |

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Next Steps


- EMS – Quality Assurance to review each case
- LEMC – Stroke Coordinator to review each case

- Both - Review at quarterly EMS meetings and as needed.

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Key Take Away

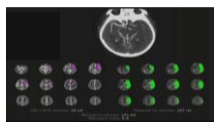
- Resolving ownership of patient and related communications
- Scope of project
- Challenge of bringing in new stakeholders
- Patience with partners



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CT Perfusion Transfer Process

- Similar themes
- EMS will make call, contingent on having a reminder
- Determining language for communication (Stroke pt direct to CT too close to typical stroke arrivals)
- Dry Run




Slide 27

AHA/ASA 2018 Guidelines: Late thrombectomy

7. 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.

8. In selected patients with AIS within 0 to 24 hours of last known normal who have LVO in the anterior circulation and meet other DAWN eligibility criteria, mechanical thrombectomy is reasonable.

| | |
|----|-----|
| I | A |
| Ba | B-R |



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