**Description of the procedure or medication requested:**

Tissue Plasminogen Activator (tPA, Alteplase) is a thrombolytic agent used in the treatment of Acute Ischemic Stroke (AIS). It is considered the gold standard for treatment of AIS and is the only medication currently approved for treatment of AIS. tPA is typically administered in the hospital setting as an initial bolus, then IV drip lasting up to an hour. tPA works by dissolving clot and improving blood flow in the brain. If given within window (up to 4.5 hours in eligible patients), can reduce death and permanent disability. **We are applying for tPA to be added to the Local Optional Scope of Practice for Contra Costa County for inter-facility transfer of patients with AIS.**

**Description of the medical conditions for which the procedure/medication will be utilized:**

tPA infusions that have been initiated by hospital personnel on patients with AIS will be continued during inter-facility transfer. The inter-facility transfer and monitoring of the infusion and patient will be done by paramedic staffed ambulances. tPA is already in California EMS regulations for use by Critical Care Paramedics.

**Patient population that will benefit:**

Patients with AIS needing rapid interfacility transfer to a Comprehensive Stroke Center for a higher level of care.

**Description of proposed study design including the scope of the study, research question, method of evaluating the effectiveness of the procedure or medications and expected outcomes:**

N/A

**Alternatives (Please describe any alternate therapy(ies) considered for the same condition and any advantages and disadvantages:**

In Contra Costa County, patients that have had tPA infusions running have had three options for rapid transfer: Waiting until the tPA infusion has completed and transferring via 911 ALS, calling for contracted Critical Care Transport (RN level) services which are often delayed or having hospital personnel accompany the patient utilizing 911 ALS. In patients with specific types of ischemic strokes, those involving large vessel occlusions (LVO), tPA may not dissolve the entire clot or work at all. Once identified, these patients are still candidates for tPA however rapid transport to either an intervention capable facility or Comprehensive Stroke Center is needed. Waiting until the infusion is complete delays the transfer by an hour or more, and delays treatment. CCT resources are scarce in most counties even with hospital contracted providers. Hospital personnel are often reluctant to ride with the patient in the ambulance due to labor concerns from unions, risk management/legal issues, availability of nursing resources for transport and familiarization of ambulance equipment and nursing role.

**Estimated frequency of utilization:**

In 2016, 162 patients brought by EMS to Primary Stroke Centers in Contra Costa County received tPA, 34 of those were transferred to a comprehensive center for intervention. However, this only includes patients that were brought in by 911 initially and not patients that were brought in by some other means (BLS, POV), current inpatients or patients with initially resolved symptoms that started having symptoms again. This also does not include those transferred via CCT. Although patients with LVO or other types of occlusions requiring intervention typically have significant symptoms, it has been reported to the EMS agency that in one of the central county hospitals, approximately half of the patients having a stroke arrive by POV.

Since the Contra Costa County Stroke System was implemented, there has been steady growth in the administration of tPA to patients with AIS. We predict that this will continue to rise and the number of patients requiring transfer with tPA infusions will rise as well.

**Other factors or exceptional circumstances:**

Contra Costa County has a well-developed Stroke System of Care with 5 Primary Stroke Centers and the recent addition of a Comprehensive Stroke Center. Quality Improvement and Oversight is performed by the Stroke Program Coordinator at Contra Costa County and the EMS Medical Director. All of our PSC/CSC’s participate in quarterly quality improvement meetings, including the designated stroke neurologists for each of the health care systems in Contra Costa. The stroke program coordinators, ED physicians and neurologists all have significant input into the treatment and transport of stroke patients by EMS. The LEMSA depends on the subject matter experts for up to date information on stroke care. Ultimately, it is the LEMSA’s responsibility to ensure that stroke patients being transported by 911 or 911 inter-facility transfer are done so in the safest manner possible. Minimizing risk in these medically complicated patients is imperative.

Stroke care is rapidly evolving. The need for transfers with tPA may be made obsolete due to new drug therapies and/or stroke system redesign, getting patients who may need intervention to an intervention capable center quicker. Our request for the approval for tPA for Optional Scope of Practice is to enhance a transfer process that already currently exists.

**System Evaluation, Quality Improvement and Oversight**

Each transfer will be reviewed by the Stroke Program Coordinator. Data will be collected on time intervals, treatment delivered and any deviation from the field treatment guideline. In Contra Costa County, we support a Just Culture approach and feedback to the providers will be education and remediation driven. Sentinel events will be reported immediately to Contra Costa County EMS. All aggregate data will be reported at the quarterly Stroke Oversight meetings. Identified areas of improvement will be based on data from the system and the PDSA model for quality improvement will be utilized. Data is currently be collected on transfers and will be expanded to include any metrics or benchmarks necessary to ensure compliance and safety.

**Outstanding Issues – IV Pumps and Blood Pressure Control**

There are two issues that have not been addressed in this request: Use of IV pumps and blood pressure control. All attached examples of IFT treatment guidelines from other states include the use of medications to lower and maintain blood pressure within parameters set forth by the AHA/ASA. Currently, there are no IV blood pressure medications within Expanded or Local Scope of Practice. In review with our Comprehensive Center and the Kaiser Regional Neurologist, the majority of all transfers for patients with identified LVO’s to a higher level of care did not require blood pressure control. However, there will need to be an internal hospital algorithm that determines what type of transport is the safest for patients when faced with the need for blood pressure management. This will be developed with stroke system oversight stakeholders and the EMS Agency.

tPA must be on an IV pump during infusion. This will mean a review of the current infusion equipment in the hospitals and how to continue that infusion during transport. Training and education will be needed for use of the pumps and pump malfunction. IFT with tPA is done in other parts of the country with paramedics successfully; researching those processes will be necessary to determine the best equipment and processes to be implemented. There are multiple types of pre-hospital pumps and extension tubing for existing infusion equipment that can be used for IFT purposes. The IFT process is designed to decrease the time at the Primary Stroke Center to the time the patient receives intervention. Adding tPA into Local Optional Scope of Practice for Paramedics will give hospitals another option for rapid inter-facility transfer.

**Attachments**

Attachment A – Inter-facility Transfer of Stroke Patients, past field treatment guideline.

Attachment B – 2015 AHA/ASA Update

Attachment C – Improving Transfer Times for Acute Ischemic Stroke Patients to a Comprehensive Stroke Center

Attachment D – State of Wisconsin EMS IFT policy

Attachment E – State of Kentucky EMS IFT policy

Attachment F – State of Virginia EMS IFT policy

Attachment G – Past training on tPA, will be updated in collaboration with Stroke System Oversight partners.

Attachment H – Contra Costa County Stroke System Data