Does patient have focal neurological deficit with onset within the last 24 hours?

Yes

Call OneCall (720-777-3999), Option 1, to place a text page to Neurology Inpatient Resident “Emergency page, stroke concern NOC or OSH”

OneCall RN will coordinate conference call between Neurology Inpatient Resident, referring physician, and any other physicians requested to determine optimal patient evaluation, treatment and disposition

Obtain CT Head

If advised by stroke team, obtain MRI/MRA or CTA Head/Neck

Is there a demonstrated large vessel (ie internal carotid artery or M1) occlusion or high likelihood of a large vessel occlusion?

Yes

Initiate conference call via OneCall (720-777-3999) with:
- Peds stroke attending
- Neuro interventional physician
- Attending of record

No

Is patient candidate for thrombectomy?

Yes

Continue transfer center call:
- Mobilize MRI team, if needed (Operator 7-5555)
- Mobilize Neuro-IR team (Operator 7-5555)

(If Neuro-IR mobilized, Neuro to ask primary team to order Neuro IR Stroke/Thrombectomy Pre-Procedure order set)

No

Continue transfer center call:
- Mobilize MRI team, if needed (Operator 7-5555)
- Mobilize Neuro-IR team (Operator 7-5555)

(If Neuro-IR mobilized, Neuro to ask primary team to order Neuro IR Stroke/Thrombectomy Pre-Procedure order set)

Transfer to CHCO Anschutz as appropriate

- Once ETA is known, OneCall to call Operator and send ETA and MRN to:
  - Stroke alert team
  - MRI team (if previously mobilized)
  - Neuro-IR team (if previously mobilized)

(In rare occasions when CHCO is unable to care for patient, may consider transfer to University or other adult comprehensive stroke center. Decision made by stroke, ED, and IR attendings)

Thrombolytic therapy (such as IV tPA) is not FDA approved for treatment of stroke below the age of 18. Use of thrombolytic therapy in children for stroke may be considered in appropriate cases with neurology and stroke consultation. If thrombolytic therapy use is being considered review the “tPA for stroke” checklist, and obtain consent. IV tPA is not currently available at the NOC sites.

Inclusion Criteria:
Patients older than 1 month of age with onset of signs/symptoms of focal neurological deficit within last 24 hours

Patient presenting with signs/symptoms of focal neurological deficit such as:
- Weakness on one side of the body or face
- Numbness on one side of the body or face
- Aphasia, including:
  - Able to understand, but not speak
  - Awake and alert, but “word salad” speech
- Uncoordinated on one side of body
- Unable to see on one side

Contact CHCO Neurology via OneCall (720-777-3999) for appropriate disposition:
8am – 5pm: Neurology Inpatient ICU Resident
5pm – 8am: Neurology Inpatient Resident

Patient presenting with signs/symptoms of focal neurological deficit such as:
- Weakness on one side of the body or face
- Numbness on one side of the body or face
- Aphasia, including:
  - Able to understand, but not speak
  - Awake and alert, but “word salad” speech
- Uncoordinated on one side of body
- Unable to see on one side
Algorithm 2. Stroke Alert - Anschutz Campus

**Stroke Alert Criteria:**
Patients older than 1 month of age with onset of signs/symptoms of focal neurological deficit within last 24 hours

Patient presenting with signs/symptoms of focal neurological deficit such as:
- Weakness on one side of the body or face
- Numbness on one side of the body or face
- Aphasia, including:
  - Able to understand, but not speak
  - Awake and alert, but “word salad” speech
- Uncoordinated on one side of body
- Unable to see on one side

**Does patient meet Stroke Alert Criteria?**

- Yes: Call a Stroke Alert ext. 7-5555
- No: Call for a neurology consult ext. 7-3999

**Options for work up outside of stroke alert:**
Epic order - MRI Stroke or TIA (urgent perform within 24 hrs); can be expedited to be as soon as possible but outside of pathway requires attending to attending discussion
Algorithm 2. Continuation of Stroke Alert - Anschutz Campus

**Anschutz Procedures:**
- May use EPIC Stroke Alert order set.
- No normothermia: treat all temps > 38.0 with acetaminophen.
- Normotensive: check BP every 15 minutes and notify treating provider and neurology if SBP < 90th or > 95th percentile for age. Neuro to assist with BP management.
- Normal O2: Nasal cannula to maintain SpO2 >90%.
- Euvolemic with normal saline, CAUTION: No IV fluid bolus until mass ruling out.
- Establish IV access.
- NPO.
- Head of Bed Flat: FLAT, keep head of bed flat. CAUTION: If signs of increased ICP, please elevate head of bed to 30 degrees and order STAT Head CT.
- EKG & Chest X-Ray.
- Transfer to ICU if patient is on floor (excludes ED).

**Clinical Pathway:**

<table>
<thead>
<tr>
<th>Patients without Sickle Cell Disease (SCD)</th>
<th>Patients with Sickle Cell Disease (SCD)</th>
</tr>
</thead>
</table>
| STAT Labs: &bull; CBC; CRP; DIC panel; LFTs; ESR, CRP, urine toxicology screen; When appropriate serum or urine β-β-HCG or specialized testing for patient on anticoagulation. | STAT Labs: &bull; CBC; CRP; serum or urine β-β-HCG when appropriate, urine toxicology screen, type and cross match, and hemoglobin electrophoresis. Draw blood cultures if Sickle Cell Disease (SCD) patient is febrile.
| Imaging: MRI BRAIN STROKE ALERT – EMERGENT (perform ASAP) CT head; If MRI is not immediately available or patient symptoms are worsening. | Imaging: MRI BRAIN STROKE ALERT – EMERGENT (perform ASAP) CT head; If MRI is not immediately available or patient symptoms are worsening.
| Other: &bull; If neurology asks for CT/CTA, then proceed with that modality. &bull; Febrile patients: consider starting antibiotics and drawing blood cultures. | Other: &bull; If neurology asks for CT/CTA, then proceed with that modality. &bull; Febrile patients with Sickle Cell Disease (SCD): start antibiotics after drawing blood cultures.

**Neurology Procedures:**
- Neurology at bedside ASAP, responsibilities include:
  - Document Pediatric NIH Stroke Scale score.
  - May mobilize MRI team if:
    - Non-neurologic stroke (greater than 1 month old).
    - Presentation consistent with stroke.
    - Time of symptom onset within 24 hours.
  - Neurology may mobilize MRI team without exam if concern for large vessel occlusion or patient is a possible tPA candidate.

**Other Consulting Services**
- Cardiology: evaluate at bedside if patient has history of congenital heart disease or other cardiac concern.
- Hematology: evaluate at bedside if patient has Sickle Cell Disease.

**Goal:**
- Door to MRI start 60-90 minutes.

**Options for work up outside of stroke alert:**
- Epic order - MRI Stroke or TIA (urgent perform within 24 hrs); can be expedited to be as soon as possible but outside of pathway requires attending to attending discussion.

**Calculate/Disposition:**
- Neurology confirm patient meets Stroke Alert Criteria.

**Imaging consistent with a stroke?**
- Yes
  - Neurology to review tPA form (Appendix A) and IA checklist (Appendix F) for guidance.
  - Time since onset of symptoms:
    - Less than 4.5 hours:
      - Neurology to determine appropriate disposition.
    - More than 4.5 hours:
      - Confirm large vessel occlusion?
        - Yes
          - Initiate transfer center call:
            - Contact Operator at 7-5555.
            - Mobilize Neuro-IR team.
            - Alert ICU/CICU via conference call (IF Neuro-IR mobilized, Neuro to ask primary team to order Neuro IR Stroke/Thrombectomy Pre-Procedure order set).
        - No
          - Neurology to determine appropriate disposition.
- No
  - Neurology to determine appropriate disposition.

**Neurology to mobilize MRI team as needed (7-5555):**
- Neuro interventional physician.
- Attending of record.

**Initiate transfer center call:**
- Contact Operator at 7-5555.
- Mobilize Neuro-IR team.
- Alert ICU/CICU via conference call (IF Neuro-IR mobilized, Neuro to ask primary team to order NEuro IR Stroke/Thrombectomy Pre-Procedure order set).

**Likely candidate for thrombectomy?**
- Yes
  - Initiate conference call via OneCall (720-777-3999) with:
    - Peds stroke attending.
    - Neuro interventional physician.
    - Attending of record.
  - Continue transfer center call:
    - Contact Operator at 7-5555.
    - Mobilize Neuro-IR team.
    - Alert ICU/CICU via conference call (IF Neuro-IR mobilized, Neuro to ask primary team to order Neuro IR Stroke/Thrombectomy Pre-Procedure order set).
- No
  - Neurology to review tPA form (Appendix A) and IA checklist (Appendix F) for guidance.
  - Neurology to determine appropriate disposition.

**Time since onset of symptoms:**
- Less than 4.5 hours:
  - Neurology to determine appropriate disposition.
- More than 4.5 hours:
  - Confirmed large vessel occlusion?
    - Yes
      - Consensus among stroke & IR attending that patient is a good IA therapy candidate?
        - Yes
          - Neurology to determine appropriate disposition (to be contacted by neurology).
        - No
          - Continue transfer center call:
            - Contact Operator at 7-5555.
            - Mobilize Neuro-IR team.
            - Alert ICU/CICU via conference call (IF Neuro-IR mobilized, Neuro to ask primary team to order Neuro IR Stroke/Thrombectomy Pre-Procedure order set).
    - No
      - Neurology to determine appropriate disposition.
Algorithm 3. Stroke Alert - Colorado Springs Hospital

Patient presenting with signs/symptoms of focal neurological deficit such as:
- Weakness on one side of the body or face
- Numbness on one side of the body or face
- Aphasia, including:
  - Able to understand, but not speak
  - Awake and alert, but “word salad” speech
- Uncoordinated on one side of body
- Unable to see on one side

Does patient have focal neurological deficit with onset within the last 24 hours?

Yes: Contact Colorado Springs Neurology via OneCall (720-777-3999)

No: Call OneCall (720-777-3999), Option 1, to place a text page to the on-call Colorado Springs Neurologist. The Neurologist will determine whether to include the stroke team on the call, which the transfer center can arrange.

OneCall RN will coordinate conference call between Neurology, referring physician, and any other physicians requested to determine optimal patient evaluation, treatment and disposition.

Obtain CT Head
If advised by stroke team, obtain MRI/MRA or CTA Head/Neck

May consider IV tPA*

Yes: Is patient potential candidate for tPA?

Yes: Initiate conference call via OneCall (720-777-3999) with:
- Colorado Springs Neurology attending
- Peds stroke attending
- Neuro interventional physician
- Attending of record

Is there a demonstrated large vessel (ie internal carotid artery or M1) occlusion or high likelihood of a large vessel occlusion?

Yes: Continue transfer center call:
- Mobilize MRI team, if needed (Operator 7-5555)
- Mobilize Neuro-IR team (Operator 7-5555)
- In rare occasions when CHCO is unable to care for patient, may consider transfer to University or other adult comprehensive stroke center. Decision made by stroke, ED, and IR attendings)

No: Continue transfer center call:
- Mobilize MRI team, if needed (Operator 7-5555)
- Mobilize Neuro-IR team (Operator 7-5555)
- (If Neuro-IR mobilized, Neuro to ask primary team to order Neuro IR Stroke/Thrombectomy Pre-Procedure order set)

No: Is patient candidate for thrombectomy?

Yes: Continue transfer center call:
- Mobilize MRI team, if needed (Operator 7-5555)
- Mobilize Neuro-IR team (Operator 7-5555)

No: Transfer to CHCO Anschutz as appropriate.

Inclusion Criteria:
Patients older than 1 month of age with onset of signs/symptoms of focal neurological deficit within last 24 hours

*Thrombolytic therapy (such as IV tPA) is not FDA approved for treatment of stroke below the age of 18. Use of thrombolytic therapy in children for stroke may be considered in appropriate cases with neurology and stroke consultation. If thrombolytic therapy use is being considered review the “tPA for stroke” checklist, and obtain consent.
TARGET POPULATION

Inclusion Criteria

- Patients older than 1 month of age, with onset of signs/symptoms of focal neurological deficit within last 24 hours

Age Considerations

- Patients appropriate for acute stroke care at Children’s Hospital Colorado (CHCO) Anschutz:
  - Children under the age of 18
  - Young adults admitted to CHCO (or in the CHCO Anschutz ED) with pediatric disease
  - Adults admitted to CHCO for heart procedures or other care

- Patients who should usually be transferred to an Adult Stroke Center if they have acute stroke symptoms:
  - Employees, Visitors or Parents in our facility who are 18 years of older

- Adult Patients (18 years or older) cared for at CHCO who are outside of our facility should usually be triaged to an Adult Stroke Center
BACKGROUND | DEFINITIONS

Focal neurological deficit: signs/symptoms of focal neurological deficit may include one or more of the following:

- Weakness on one side of body or face
- Numbness on one side of the body or face
- Aphasia, including:
  - Able to understand, but not speak
  - Awake and alert, but “word salad” speech
- Uncoordinated on one side of body
- Unable to see on one side

INITIAL TRIAGE (SEE ALGORITHM 1. STROKE ALERT NOC OR OSH)

For children located in Children’s Hospital Colorado Network of Care (NOC) or OUTSIDE Children’s Hospital Colorado

If patient displays symptoms 24 hours or less and focal neurological deficit:

- Call OneCall (720-777-3999), Option 1, to place a text page to Neurology Inpatient Resident: “Emergency page, stroke concern NOC or OSH”.
- OneCall RN will coordinate conference call between Neurology Inpatient Resident, referring physician, and any other physicians requested, to determine optimal patient evaluation, treatment, and disposition.
- The Neurology fellow is expected to call back immediately and provide further guidance.
- If the patient has sickle cell disease (SCD) or known bleeding disorder, the neurology resident and transfer center will conference in the hematology fellow/attending immediately.
- If the patient has heart disease the neurology resident and transfer center will conference in the cardiology fellow/attending immediately.

Most patients who need stroke care, including intra-arterial such as mechanical thrombectomy, will be transferred to Children’s Hospital Colorado Anschutz Campus.

In rare occasions when CHCO is unable to care for patient, may consider transfer to University or another adult comprehensive stroke center. Decision made by stroke, ED, and IR attending.

Treatment considerations for NOC or OSH provider to discuss with Neurology:

- Notify hematology for SCD patients or known bleeding disorder
- Notify cardiology for children with known heart disease
- Obtain CT head (or MRI brain, if indicated) prior to transport, if available
- Thrombolytic therapy (such as IV tPA) is not FDA approved for treatment of stroke below the age of 18. Use of thrombolytic therapy in children for stroke may be considered in appropriate cases with neurology and stroke consultation. If thrombolytic therapy use is being considered review the “tPA for stroke” checklist, and obtain consent. IV tPA is not currently available at the NOC sites.
- Consider aspirin after hemorrhage ruled out by imaging
- Transportation
  - Utilize most rapid means of transportation available for hyperacute therapy candidates, based upon timeframe for potential treatment. Take into account distance, weather, and the patient’s clinical status
Transfer Center can assist in arranging transportation
- Transport with 1 parent if possible, to facilitate rapid stroke treatment consent
- Frequent neurological checks en route
- Obtain CT head (or MRI brain, if indicated) prior to transport, if available

Symptoms more than 24 hours:

Contact CHCO Neurology via OneCall (720-777-3999) for appropriate disposition:

- 8am – 5pm: Neurology Inpatient ICU Resident
- 5 pm – 8am: Neurology Inpatient Resident

INITIAL TRIAGE (SEE ALGORITHM 3. STROKE ALERT COLORADO SPRINGS HOSPITAL)

For children located at Colorado Springs Hospital Campus

If patient displays symptoms 24 hours or less and focal neurological deficit:

- Call OneCall (720-777-3999), Option 1, to place a text page to the on-call Colorado Springs Neurologist. The Colorado Springs Neurologist will determine whether to include the stroke team on the call, which the transfer center can arrange.
- OneCall RN will coordinate conference call between the on-call Colorado Springs Neurologist, referring physician, and any other physicians requested, to determine optimal patient evaluation, treatment, and disposition.
- The Neurology fellow is expected to call back immediately and provide further guidance.
- If the patient has sickle cell disease (SCD) or known bleeding disorder, the neurology resident and transfer center will conference in the hematology fellow/attending immediately.
- If the patient has heart disease the neurology resident and transfer center will conference in the cardiology fellow/attending immediately.

Most patients who need stroke care, including intra-arterial such as mechanical thrombectomy, will be transferred to Children’s Hospital Colorado Anschutz Campus.

In rare occasions when CHCO is unable to care for patient, may consider transfer to University or other adult comprehensive stroke center. Decision made by stroke, ED, and IR attending.

Treatment considerations for CHCO-Colorado Springs provider to discuss with Neurology:

- Notify hematology for SCD patients or known bleeding disorder
- Notify cardiology for children with known heart disease
- Obtain CT head (or MRI brain, if indicated) prior to transport, if available
- Neurologist in Colorado Springs may consider IV tPA as a treatment. Thrombolytic therapy (such as IV tPA) is not FDA approved for treatment of stroke below the age of 18. Use of thrombolytic therapy in children for stroke may be considered in appropriate cases with neurology and stroke consultation. If thrombolytic therapy use is being considered review the “tPA for stroke” checklist, and obtain consent.
- Consider aspirin after hemorrhage ruled out by imaging
- Transportation
  - Utilize most rapid means of transportation available for hyperacute therapy candidates, based upon timeframe for potential treatment. Take into account distance, weather, and the patient’s clinical status
Transfer Center can assist in arranging transportation
- Transport with 1 parent if possible, to facilitate rapid stroke treatment consent
- Frequent neurological checks en route

**INITIAL EVALUATION AND CLINICAL MANAGEMENT (SEE ALGORITHM 2)**

For children located at Children's Hospital Colorado Anschutz Campus

**STROKE ALERT - Procedures**

**Stroke Alert should be called for any patient who meets the following:**

**Stroke Alert Criteria:**
- **Focal Neurological Deficit**
- Older than 1 month of age
- Onset of symptoms less than 24 hours ago
- **Note:** Any provider in the hospital can call a stroke alert

**Roles and Responsibilities**

- **Neurology Inpatient Resident** is expected to evaluate patient ASAP and direct management of all non-sickle cell patients. Neurology responsibilities include:
  - Document Pediatric NIH Stroke Scale score
  - Notify hematology for SCD patients or known bleeding disorder
  - Notify cardiology for children with known heart disease
  - Contact Stroke Attending for patients that may require IV tPA and/or intra-arterial therapy (call Neurology Attending for all nonacute stroke cases. Afterwards, Stroke Attending is available for consult)
  - If appropriate and approved by Stroke Attending, mobilize MRI team and/or IR team (x7-5555)
    - May activate MRI and/or IR teams without exam if concern for large vessel occlusion
- **Acute Stroke Team Attending** will co-attend with the neurology attending for any hyperacute treatment candidates, including thrombolyisis and thrombectomy from arrival to CHCO through treatment completion. Stroke attending with be available for tPA consent and to assist with thrombectomy decision.
- **Hematology fellow** is expected to evaluate sickle cell disease (SCD) patients and/or known bleeding disorder ASAP and hematology will direct management of all SCD patients. If red cell exchange is indicated, hematology will contact apheresis team. Hematology fellow is also expected to review hematology/coagulation labs, dosing of tissue plasminogen activator (tPA), and contraindications for patients with known bleeding disorders.
- **Primary team** (ED/PICU/CICU/Floor) is expected to order initial labs and start basic stroke care (Epic orderset: ED STROKE ALERT)
- **PICU Fellow** is expected to identify bed in PICU (or CICU as appropriate) & prepare for possible post-tPA/IA therapy. If patient has SCD, preparations will include line placement for red cell exchange.
- **Anesthesiology** is expected to notify attending and prepare for sedated MRI, likely with Propofol, and possible sedation for thrombectomy.
- **Radiology MR Tech** is expected to schedule STAT MRI – MRI Brain STROKE ALERT – EMERGENT (performed ASAP).
- **Pharmacy** is expected to prepare for possible need for tPA.
- **Nursing Supervisor** is expected to identify bed and nursing support.
• Cardiology Fellow is expected to evaluate patient within 30 minutes if there is known/suspected cardiac disease.
• Neuroradiology attending is expected to immediately review acute imaging and contact Stroke Attending with results. May contact neurology fellow if MRI/MRA is normal.

**Stabilization of Patient: In Emergency Department (ED) or PICU/CICU**

May use Epic Stroke Alert orderset

- Normothermia: treat all temps greater than 38.0 with acetaminophen
- Normotensive: check BP every 15 minutes and notify treating provider and neurology provider if SBP less than 50th or greater than 95th percentile for age. Neuro to assist with BP management.
- Normal O2: Nasal cannula to maintain SpO2 greater than 90%
- Euvolemia with normal saline, CAUTION: No IV fluid bolus until mass ruled out
- Establish IV access
- NPO
- Head of Bed Flat: FLAT, keep head of bed flat. CAUTION: If signs of increased ICP, elevate head of bed to 30 degrees and order STAT Head CT
- EKG & Chest X-Ray
- Transfer to ICU if patient is on floor (excludes ED)

<table>
<thead>
<tr>
<th>Patients <strong>without</strong> Sickle Cell disease (SCD)</th>
<th>Patients <strong>with</strong> Sickle Cell disease (SCD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Labs:</strong></td>
<td></td>
</tr>
<tr>
<td>CBC, CMP, DIC panel, LFTs, ESR, CRP, urine toxicology screen. When appropriate serum or urine β- HCG or specialized testing for patient on anticoagulation.</td>
<td>CBC, CMP, serum or urine β- HCG when appropriate, urine toxicology screen, type and cross match, and hemoglobin electrophoresis. Draw blood cultures if SCD patient is febrile.</td>
</tr>
<tr>
<td><strong>Imaging:</strong></td>
<td></td>
</tr>
<tr>
<td>MRI BRAIN STROKE ALERT – EMERGENT (perform ASAP)</td>
<td>MRI BRAIN STROKE ALERT – EMERGENT (perform ASAP)</td>
</tr>
<tr>
<td>CT head - if MRI is not immediately available or patient symptoms are worsening.</td>
<td>CT head- if MRI is not immediately available or patient symptoms are worsening.</td>
</tr>
<tr>
<td><strong>Other:</strong></td>
<td></td>
</tr>
<tr>
<td>If neurology asks for a different imaging modality, such as CT/CTA, then proceed with that modality.</td>
<td>If neurology asks for a different imaging modality, such as CT/CTA, then proceed with that modality.</td>
</tr>
<tr>
<td>Febrile patients: consider starting antibiotics and drawing blood cultures.</td>
<td>Febrile patients <strong>with</strong> SCD: start antibiotics after drawing blood cultures.</td>
</tr>
</tbody>
</table>
CLINICAL PATHWAY

STROKE ALERT - Procedures

Post-MRI Case Review:

- Neuroradiology reviews MRI for confirmation of acute infarction with restricted diffusion in an arterial territory consistent with the clinical syndrome.
- Neuroradiology confirms no contraindications to tPA and/or provides stroke volumes (Intra-Arterial Therapy Checklist).
- Neurology to complete IA/IV tPA criteria form (Stroke Alert – tPA Form), dose tPA (via order set: tPA for stroke), and educate family. Neurology to also review IA therapy checklist (Intra-Arterial Therapy Checklist).
- Neuroradiology will call Stroke Attending to discuss abnormal MRI findings. May contact neurology fellow if MRI/MRA is normal.
- If hyperacute therapies are being considered, Stroke Attending and any other necessary services (neuroradiology, neurointerventional physician, cardiology, hematology, etc.) will review case (can be via One call, 7-3990) to discuss MRI findings, clinical presentation and treatment options. Stroke Attending will notify Attending of record of treatment decisions.
- If there is consensus that patient should be considered for IV tPA and/or thrombectomy, then therapy may be offered.
- If patient has a large stroke (greater than 50% of MCA), they should be followed by the Early Decompressive Surgery in Malignant Infarction guideline.

TREATMENT

If less than 4.5 hours from symptom onset (and does not have SCD):

If less than 4.5 hours from symptom onset and good intravenous (IV) tissue Plasminogen Activator (tPA) candidate, IV tPA will be offered if:

- Consent is signed (Patient Informed Consent – IV-tPA for Stroke)
- Care team consensus is to offer therapy

If less than 24 hours from symptom onset (and does not have SCD):

If less than 24 hours from symptom onset and good intra-arterial therapy candidate, therapy will be offered if:

- Consent is signed (Patient Informed Consent - Mechanical Thrombectomy)
- Care team consensus is to offer therapy

In special circumstances, such as basilar thrombosis, the decision to provide intra-arterial therapies beyond established guidelines may be made but are outside the scope of this guideline.

Management of tPA administration

- Once tPA is brought to the PICU for administration (or ED/CICU if appropriate), the tPA will be physically held by the Stroke Team or Pharmacist until the decision is made by the Stroke Team Attending to administer the drug.
- Usual Dosage Range and Route for Systemic tPA (use tPA for stroke ORDERSET):
  0.9 mg/kg to a maximum of 90 mg:
  - First 10% of calculated dose given as intravenous bolus dose.
  - Remaining 90% of calculated dose given in infusion over 1 hour.
FURTHER WORK-UP AND MANAGEMENT OF PATIENTS WITH ARTERIAL ISCHEMIC STROKE OR TIA (NON-SICKLE CELL DISEASE)

- Use Epic order sets for complete work-up and management guidelines (see below).
- Admitted patients should be monitored in PICU or CICU for at least 24 hours.

If outside time window or excluded for other reasons, options for workup include:

- If stroke concern still exists but patient is not appropriate for acute intervention due to contraindication or timeline, obtain neurology consult to decide upon further workup and disposition.
- Admitted patients outside of the acute pathway (e.g. possible stroke outside of the 24 hour time-window or with a high suspicion Transient Ischemia Attack [TIA]) should receive cerebral and neurovascular imaging within 24 hours of presentation as tolerated, or sooner if indicated. Exact timing of MRI (and consideration of interval head CT) for patients in this latter category should involve an attending-to-attending discussion between neurology (and/or stroke attending) and radiology.
  - MRI Stroke or TIA (Urgent, perform within 24 hours). This will include MRI brain and MRA head and neck (time of flight with contrast and T1 fat sat images) performed at less than 24 HOURS.

EPIC ORDER SETS, PHONE NUMBERS, FORMS AND DOCUMENTS

<table>
<thead>
<tr>
<th>Epic:</th>
<th>Important phone numbers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke alert order set:</td>
<td>Stroke Alert: Operator (75555)</td>
</tr>
<tr>
<td>• ED Stroke Alert</td>
<td></td>
</tr>
<tr>
<td>IV tPA order set:</td>
<td>Mobilize MRI and/or IR teams: Operator (75555)</td>
</tr>
<tr>
<td>• tPA for Stroke</td>
<td></td>
</tr>
<tr>
<td>Post-stroke management order set:</td>
<td>Inpatient On-call Neurology Resident: One-call (7-3990)</td>
</tr>
<tr>
<td>• Neuro IP Stroke Management &amp; Evaluation</td>
<td></td>
</tr>
<tr>
<td>Pre-thrombectomy order set:</td>
<td>Stroke Attending: One Call (7-3990)</td>
</tr>
<tr>
<td>• Neuro IR Stroke/Thrombectomy Pre-Procedure</td>
<td></td>
</tr>
<tr>
<td>Post-thrombectomy order set:</td>
<td>University Hospital Stroke Service: UH ICU (720-848-5490)</td>
</tr>
<tr>
<td>• Neuro IP Post Procedure</td>
<td></td>
</tr>
<tr>
<td>Resident Epic smart phrases:</td>
<td>Conference Call: One-Call (7-3990)</td>
</tr>
<tr>
<td>• NRESSTROKEALERTPHONEINTAKE</td>
<td>Call One-Call with time of conference call (typically in 5-10 minutes) &amp; desired participants. One-Call will page everyone and set-up call.</td>
</tr>
<tr>
<td>• NRESSTROKEALERTCHECKLIST</td>
<td>Transfer center: 720-777-8838</td>
</tr>
<tr>
<td>• NRESSTROKEALERTIATHERAPY</td>
<td></td>
</tr>
<tr>
<td>• NRESSTROKEALERTTPACHECKLIST</td>
<td></td>
</tr>
</tbody>
</table>

Stroke MRIs:

<table>
<thead>
<tr>
<th>Related forms and documents:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI Stroke Alert (Emergent, perform ASAP) – MRI/MRA head and neck for stroke alert</td>
</tr>
<tr>
<td>MRI Stroke or TIA (Urgent, perform within 24 hours) – MRI/MRA head and neck for inpatient needing urgent imaging (i.e. stroke concern greater than 24 hours or TIA)</td>
</tr>
<tr>
<td>MRI Stroke (Routine) – MRI/MRA head and neck that is not urgent</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
APPENDIX A. STROKE ALERT – TPA FORM
APPENDIX B. PATIENT INFORMED CONSENT - IV-TPA FOR STROKE
APPENDIX C. CHILDHOOD ACUTE ISCHEMIC STROKE EDUCATIONAL MATERIAL
APPENDIX D. PEDIATRIC NIH STROKE SCALE (NIHSSPED)
APPENDIX E. EARLY DECOMPRESSIVE SURGERY IN MALIGNANT INFARCTION
APPENDIX F. INTRA-ARTERIAL THERAPY CHECKLIST
APPENDIX G. PATIENT INFORMED CONSENT – MECHANICAL THROMBECTOMY

REFERENCES

Child Neurology Society Ad Hoc Committee on Stroke in Children.
CLINICAL IMPROVEMENT TEAM MEMBERS

Tim Bernard, MD | Pediatric Neurology
Megan Barry, DO | Pediatric Neurology
Amy Clevenger, MD | Critical Care
Tim Luebbert, MD | Pediatric Neurology
Tim Schardt, PharmD | Clinical Pharmacy

Children’s Hospital Colorado Stroke Council:

- Cardiology: Scott Auerbach
- ED/NOC: Kevin Carney, Cortney Braund
- Neuro-IR: Josh Seinfeld, David Case, Chris Roark
- Adult Neurology: Sharon Poisson
- Anesthesia: Morris Dressler
- Neuroradiology: Nick Stence, David Mirsky
- Hematology: Beth Warren
- Neurosurgery: Corbett Wilkinson
- Neurology: Craig Press, Andra Dingman, Ricka Messer, Jan Martin, Jennifer Armstrong
- Transport: Joe Darmofal
- OneCall: Christine Silva, Erin Carey

APPROVED BY
Children's Hospital Colorado Stroke Council – April 15, 2021
Clinical Pathways & Measures Committee – April 26, 2021
Pharmacy & Therapeutics Committee – April 26, 2021

<table>
<thead>
<tr>
<th>MANUAL/DEPARTMENT</th>
<th>Clinical Pathways/Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORIGINATION DATE</td>
<td>November 14, 2014</td>
</tr>
<tr>
<td>LAST DATE OF REVIEW OR REVISION</td>
<td>April 26, 2021</td>
</tr>
</tbody>
</table>

COLORADO SPRINGS REVIEW BY

Michael DiStefano, MD
Chief Medical Officer, Children’s Hospital Colorado – Colorado Springs

APPROVED BY

Lalit Bajaj, MD, MPH
Chief Quality and Outcomes Officer

REVIEW/REVISION SCHEDULE
Scheduled for full review on April 26, 2025
Clinical pathways are intended for informational purposes only. They are current at the date of publication and are reviewed on a regular basis to align with the best available evidence. Some information and links may not be available to external viewers. External viewers are encouraged to consult other available sources if needed to confirm and supplement the content presented in the clinical pathways. Clinical pathways are not intended to take the place of a physician’s or other health care provider’s advice, and is not intended to diagnose, treat, cure or prevent any disease or other medical condition. The information should not be used in place of a visit, call, consultation or advice of a physician or other health care provider. Furthermore, the information is provided for use solely at your own risk. CHCO accepts no liability for the content, or for the consequences of any actions taken on the basis of the information provided. The information provided to you and the actions taken thereof are provided on an “as is” basis without any warranty of any kind, express or implied, from CHCO. CHCO declares no affiliation, sponsorship, nor any partnerships with any listed organization, or its respective directors, officers, employees, agents, contractors, affiliates, and representatives.

Discrimination is Against the Law. Children’s Hospital Colorado complies with applicable Federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability, or sex. Children’s Hospital Colorado does not exclude people or treat them differently because of race, color, national origin, age, disability, or sex.

Children’s Hospital Colorado provides free aids and services to people with disabilities to communicate effectively with us, such as: Qualified sign language interpreters, written information in other formats (large print, audio accessible electronic formats, other formats). Children’s Hospital Colorado provides free language services to people whose primary language is not English, such as: Qualified interpreters, information written in other languages.

If you need these services, contact the Medical Interpreters Department at 720.777.9800.

If you believe that Children’s Hospital Colorado has failed to provide these services or discriminated in another way on the basis of race, color, national origin, age, disability, or sex, you can file a grievance with: Corporate Compliance Officer, 13123 E. 16th Avenue, B450, Aurora, Colorado 80045. Phone: 720.777.1234, Fax: 720.777.7257, corporate.compliance@childrenscolorado.org. You can file a grievance in person or by mail, fax, or email. If you need help filling a grievance, the Corporate Compliance Officer is available to help you.

You can also file a civil rights complaint with the U.S. Department of Health and Human Services, Office for Civil Rights, electronically through the Office for Civil Rights Complaint Portal, available at corporate.hhs.gov/ocr/portal/lobby.jsf, or by mail or phone at: U.S. Department of Health and Human Services 200 Independence Avenue, SW Room 509F, HH Building Washington, D.C. 20201 1-800-368-1019, 800-537-7897 (TDD) Complaint forms are available at www.hhs.gov/ocr/office/file/index.html.

Children’s Hospital Colorado complies with applicable Federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability, or sex.

ATENCIÓN: si habla español, tiene a su disposición servicios gratuitos de asistencia lingüística. Llame al 1-720-777-9800.


注意：如果您使用繁體中文，您可以免費獲得語言援助服務。請致電1-720-777-9800。

ВНИМАНИЕ: Если вы говорите на русском языке, то вам доступны бесплатные услуги перевода. Звоните 1-720-777-9800.


注意事項：日本語で話される場合、無料の言語支援をご利用いただけます。1-720-777-9800 まで、お電話にてご連絡ください。