This care process model (CPM) defines the multidisciplinary coordination required to deliver the highest standard of care in the treatment of acute ischemic stroke. Patients experience the best outcomes and fewer complications when hospitals use standardized processes designed to improve evidence-based measures of success. This CPM serves as an interprofessional agreement to deliver care that results in the best outcomes by achieving the following goals:

- Increase access to thrombolytic and thrombectomy for ischemic stroke
- Decrease time from ED arrival to intervention for ischemic stroke
- Improve safety of acute intervention for ischemic stroke by reducing variation in the delivery of care

Intermountain’s quality of care for the treatment of ischemic stroke is measured against the following standards:

- **Joint Commission National Quality Measure:** STK-4 Thrombolytic Therapy
- **Vizient:** Inpatient Mortality
- **American Heart Association:** Get With the Guidelines®; Time to Intravenous Thrombolytic Therapy
- **American Heart Association:** Get With the Guidelines®; Time to Door to Start of Device

**RESPONSIBILITY MATRIX**

A Care Process Model is a system-wide continuous improvement project directed at improving outcomes through adherence to best practices. The Responsibility Assignment Matrix describes the commitment of different parts of the health system in this ongoing collaboration.

<table>
<thead>
<tr>
<th>CPM Responsibility Matrix</th>
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<tr>
<td>Content and Updates</td>
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<tr>
<td><strong>Responsible:</strong> Neurosciences Clinical Program</td>
</tr>
<tr>
<td><strong>Accountable:</strong> Neurosciences Clinical Program Senior Leadership</td>
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<tr>
<td><strong>Consulted:</strong> Emergency Medicine Operations Lane</td>
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<td><strong>Informed:</strong> VP of Clinical Programs</td>
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<td><strong>Informed:</strong> Acute Care Operations</td>
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**WHAT’S INSIDE?**

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**INTERMOUNTAIN GOALS AND MEASURES**

- ED arrival to Stroke/TeleStroke activation. **Goal:** ≤10 minutes
- ED arrival to CT scan. **Goal:** ≤15 minutes
- ED arrival to IV thrombolytic **Goal:** ≤60 minutes with stretch ≤45 minutes
- ED arrival to deployment of endovascular therapy (EVT) device **Goal:** ≤90 minutes for direct ED arrival; ≤60 minutes for transferred patients
- Rate of symptomatic hemorrhagic conversion of ischemic stroke after intervention. Watch metric.

**KEY SUPPORTING EVIDENCE**

2019 AHA/ASA Guideline for Early Management of Acute Ischemic Stroke

**CAREGIVER RESOURCES**

- Intermountain Stroke Services
- TeleStroke Dashboard
- IV Thrombolytic Exclusion Criteria
- NIH Stroke Scale (NIHSS)
- NIHSS AHA Learning Center

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ALGORITHM 1: CLASSIFICATION

Patient presents with signs and symptoms of stroke (a)

Have symptoms entirely resolved?

- yes
- no

Determine time last known well (b)

0–6 hours

On-site Neurology available?

- yes
- no

Activate ED Code Stroke 1
Order ED Code Stroke 1 PP *

Activate ED Code Stroke Telestroke 1
Call Transfer Center
Order ED Code Stroke Telestroke 1 PP *

Proceed to Algorithm 2: Emergency Management of Acute Ischemic Stroke (0–6 hr) (see pg 3)

6–24 hours

On-site Neurology available?

- yes
- no

Activate ED Code Stroke 2
Order ED Code Stroke 2 PP *
Call Transfer Center
Order ED Code Stroke Telestroke 2 PP *

Proceed to Algorithm 3: Emergency Management of Acute Ischemic Stroke (6–24 hr) (see pg 4)

>24 hours

Order ED Neuro Stroke 3 PP *
Order NIHSS Physician Documentation

(a) Signs and symptoms

Assess using **BE FAST:**
- **B**alance: Sudden loss of balance or coordination
- **E**yes: Sudden loss of vision or double vision
- **F**ace: Sudden weakness of the face
- **A**rms: Sudden weakness of an arm or leg
- **S**peech: Sudden difficulty speaking
- **T**ime: Time the symptoms started

(b) Determine time last known well

IDENTIFY:
- Time of last normal interaction with another person
- Bedtime and when patient awoke with deficits
- Patient-reported onset time, when this is dependable despite current deficits
Acute ischemic stroke (0-6 hours)

**ED Code Stroke 1**

1. **Conduct stat imaging (CT/CTA)**

**ED Physician:**
- **Review exclusion criteria for IV thrombolytic with Neurology consult**
- **Evaluate for endovascular therapy** (Perform CTA if using telestroke)

**ED Code Stroke Telestroke 1**

1. **Conduct stat imaging (CT)**

**Thrombolytic† recommended per criteria?**

- **yes**
  - **Discuss thrombolytic risk and benefits with patient/surrogate decision maker (written consent not required)**
  - **Administer IV thrombolytic†**
  - **Monitor patient**
  - **Record baseline stroke score**

- **no**
  - **Evaluate for endovascular therapy** (Perform CTA if using telestroke)

**Appropriate candidate for EVT per 0-6 hr criteria?**

- **yes**
  - **Activate Interventional Radiology (IR) Team**

- **no**
  - **Manage based on IV thrombolytic status**

**Endovascular Center**

- **Transfer to IR for EVT**

**Non-Endovascular Center**

- **Transfer to nearest Endovascular Center for EVT**

**Admit to ICU-level care for post hyperacute care**

**Consider** Tele-Neurocritical Care consultation

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Indicates an Intermountain measure

† Use tenecteplase as IV thrombolytic for adults with acute ischemic stroke

*Stat Stroke Imaging Power Plans (PP):
- ED Code Stroke 1
- ED Code Stroke Telestroke 1
- PR Stroke Symptoms (nurses)
- PR Stroke Symptoms Telestroke (nurses)

**See introduction page for EVT-related data points and metrics.**
Algorithm 3: Emergency Management of Acute Ischemic Stroke (6–24 Hours)

Acute ischemic stroke (6–24 hours)

*PSCs follow this pathway when using telestroke

1. **ED Code Stroke 2**
   - Conduct stat imaging (CT / CTA / CTP)**

2. **ED Code Stroke Telestroke 2**
   - Conduct stat imaging (CT / CTA)**

**ED physician:**
- Review criteria for endovascular therapy (EVT) with Neurology consult
- Order ED stroke management PP

- **Appropriate candidate per 6–24 hr criteria?**
- Yes
  - Activate Interventional Radiology (IR) Team†
  - Endovascular Center
    - Transfer to IR for EVT
    - Admit to ICU-level care for post-IR care;
    - Consider Tele-neurocritical care consultation
  - Non-Endovascular Center
    - Transfer to nearest Endovascular Center ED for CTP
    - Activate Code Stroke on arrival
    - Prioritize obtaining CTP
    - Order ED Code Stroke Power Plan
    - Transfer to IR if CTP imaging is favorable
- No
  - Discuss with Neurology to determine if candidate for WAKE-UP protocol or admission‡

**Stat Stroke Imaging Power Plans (PP):**
- ED Code Stroke 2
- ED Code Stroke Telestroke 2

**Stat Stroke Imaging Power Plans (PP):**
- ED Code Stroke 2
- ED Code Stroke Telestroke 2

†See introduction page for EVT-related data points and metrics.
‡STAT MRI will be ordered when WAKE-UP eligible

Note: This document presents an evidence-based model of care that is appropriate for most patients. It should be adapted to meet the needs of individual patients and situations and should not replace clinical judgment. Send feedback to Intermountain’s Neurosciences Clinical Program.