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>Responsible: Neurosciences Clinical Program</td>
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<tr>
<td>Accountable: Neurosciences Clinical Program Senior Leadership</td>
</tr>
<tr>
<td>Consulted: Emergency Medicine Operations Lane</td>
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<td>Informed: VP of Clinical Programs</td>
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</tbody>
</table>

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
**ALGORITHM 1: CLASSIFICATION**

Patient presents with signs and symptoms of stroke (a)

Have symptoms entirely resolved?

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

- **no**
  - Determine time last known well (b)

**0 – 6 hours**

On-site Neurology available?

- **yes**
  - Activate ED Code Stroke 1
  - Order ED Code Stroke 1 PP*
  - Neurologist consider WAKE-UP protocol

- **no**
  - Activate ED Code Stroke Telestroke 1
  - Call Transfer Center
  - Order ED Code Stroke Telestroke 1 PP*

**6 – 24 hours**

On-site Neurology available?

- **yes**
  - Order ED Neuro Stroke 3 PP*
  - Order NIHSS Physician Documentation

- **no**
  - Activate ED Code Stroke 2
  - Order ED Code Stroke 2 PP*
  - Neurologist consider WAKE-UP protocol
  - Order ED Code Stroke Telestroke 2 PP*

**> 24 hours**

Order ED Code Stroke 2
Order ED Code Stroke Telestroke 2 PP*

**ALGORITHM NOTES**

(a) Signs and symptoms

Assess using BE FAST:
- **Balance**: Sudden loss of balance or coordination
- **Eyes**: Sudden loss of vision or double vision
- **Face**: Sudden weakness of the face
- **Arms**: Sudden weakness of an arm or leg
- **Speech**: Sudden difficulty speaking
- **Time**: 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)

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

**See introduction page for EVT-related data points and metrics.

ALGORITHM 2: EMERGENCY MANAGEMENT OF ACUTE ISCHEMIC STROKE (0–6 HOURS)

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

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

‡ Indicate an Intermountain measure

† Thrombolytic† recommended per criteria?
- yes
- no

- yes
  - 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

- no
  - 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
ALGORITHM 3: EMERGENCY MANAGEMENT OF ACUTE ISCHEMIC STROKE (6 – 24 HOURS)

Acute ischemic stroke (6-24 hours)

*PSCs follow this pathway when using telestroke

ED Code Stroke 2*

Conduct stat imaging (CT/CTA/CTP)**

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

yes

no

Appropriate candidate per 6 – 24 hr criteria?

Activate Interventional Radiology (IR) Team†

Discuss with Neurology to determine if candidate for WAKE-UP protocol or admission‡

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

**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.