A Resident Guide to the
Primary Stroke Program

Organized by

t-Packard

Primary Business Address
Address Line 2
Address Line 3
Address Line 4
Phone: 555-555-5555
Fax: 555-555-5555
Email: someone@example.com
**Primary Stroke Program**

**Contacts**

- Neurointerventionalist: 856-361-1404
- Neurology Residents: Ext. 81620, 81621, 81787, 81788
- ICU Attending: Ext. 4829, 4084 (after midnight)
- ED Attending: Ext. 3278
- ED ACD: Ext. 8534
- MRI Technician: Ext. 2299
- CT Technician in ED: Ext. 4817
- Stroke Coordinator: 856-562-0557

**ED Protocol & NIHSS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a.</td>
<td>Level of Consciousness (Alert, drowsy, etc.)</td>
<td>0 = Alert, 1 = Drowsy, 2 = Stuporous, 3 = Coma</td>
</tr>
<tr>
<td>1b.</td>
<td>LOC Questions (Month, age)</td>
<td>0 = Answers both correctly, 1 = Answers one correctly, 2 = Incorrect</td>
</tr>
<tr>
<td>1c.</td>
<td>LOC Commands (Open/close eyes, make fist/let go)</td>
<td>0 = Obey by both correctly, 1 = Obey by one correctly, 2 = Incorrect</td>
</tr>
<tr>
<td>2.</td>
<td>Best Gaze</td>
<td>0 = Normal, 1 = Partial gaze palsy, 2 = Forced deviation</td>
</tr>
<tr>
<td>3.</td>
<td>Visual Fields (Introduce visual stimulus/threat to pt's visual field quadrants)</td>
<td>0 = No visual loss, 1 = Partial Hemianopia, 2 = Complete Hemianopia, 3 = Bilateral Hemianopia (Blind)</td>
</tr>
<tr>
<td>4.</td>
<td>Facial Paresis</td>
<td>0 = Normal, 1 = Minor, 2 = Partial, 3 = Complete</td>
</tr>
<tr>
<td>5a.</td>
<td>Motor Arm - Left</td>
<td>0 = No drift, 1 = Drift, 2 = Can't resist gravity, 3 = No effort against gravity, 4 = No movement, X = Untestable (Joint fusion or limb amp)</td>
</tr>
<tr>
<td>5b.</td>
<td>Motor Arm - Right</td>
<td>(Elevate arm to 60º if patient is sitting, 45º if supine)</td>
</tr>
<tr>
<td>6a.</td>
<td>Motor Leg - Left</td>
<td>0 = No drift, 1 = Drift, 2 = Can't resist gravity, 3 = No effort against gravity, 4 = No movement, X = Untestable (Joint fusion or limb amp)</td>
</tr>
<tr>
<td>6b.</td>
<td>Motor Leg - Right</td>
<td>(Elevate leg 30º with patient supine)</td>
</tr>
<tr>
<td>7.</td>
<td>Limb Ataxia</td>
<td>0 = No ataxia, 1 = Present in one limb, 2 = Present in two limbs</td>
</tr>
<tr>
<td>8.</td>
<td>Sensory</td>
<td>(Pin prick to face, arm, trunk, and leg - compare side to side)</td>
</tr>
<tr>
<td>9.</td>
<td>Best Language</td>
<td>(Name item, describe a picture and read sentences)</td>
</tr>
<tr>
<td>10.</td>
<td>Dysarthria</td>
<td>(Evaluate speech clarity by patient repeating listed words)</td>
</tr>
<tr>
<td>11.</td>
<td>Extinction and Inattention</td>
<td>(Use information from prior testing to identify neglect or double simultaneous stimuli testing)</td>
</tr>
</tbody>
</table>
**ED Acute Stroke Protocol**

Patient arrives

- CODE Stroke Initiated

Patient moved to Temporary ED Location

1. Initial Assessment
2. Place 18/20g IV in Antecutbital
3. Labs Drawn—PT/INR, CBC, BMP
4. POC Glucose

Patient to CT Bed

Decide Treatment

- IV tPA
- Intervention
- No Treatment

Admit to Stroke Unit or ICU
### Primary Stroke Core Measures

| STK-1* | Deep Vein Prophylaxis by the end of Hospital Day 2 |
| STK-2 | Discharged on Antithrombotic Therapy |
| STK-3 | Patients with Atrial Fibrillation/Flutter receive |
| STK-4 | Thrombolytic Therapy Administered |
| STK-5 | Antithrombotic Therapy initiated by the end of |
| STK-6 | Discharged on Statin Medication |
| STK-7* | Dysphagia Screening |
| STK-8* | Stroke Education |
| STK-9* | Smoking Cessation Education |
| STK-10* | Assessed for Rehab |

* Indicates the Core Measures that apply to ICH and SAH patients

### CODE Stroke & Timing Goals

#### Timing Goals

- **Door to Interventional Table** — 90 minutes

![Stroke Protocol](image-url)
STK-1: DVT Prophylaxis by the end of Day 2

Patients with ischemic or hemorrhagic stroke receive DVT prophylaxis by the END OF HOSPITAL DAY 2

Acceptable types of DVT Prophylaxis

- Low Dose Unfractionated Heparin—SubQ Heparin
- Low Molecular Weight Heparin—Lovenox, Fragmin
- Intermittent Pneumatic Compression Devices, FlowTrons, IPCs
- Graduated Compression Stockings
- Factor Xa Inhibitors
  - Oral—Xarelto (rivaroxaban), Eliquis (apixaban), Pradaxa (dabigatran)
  - SubQ—Arixtra (fondaparinux), Refludan (lepirudin)
  - IV—Refludan (lepirudin), Argatroban
- Warfarin
- Venous Foot Pumps

Reasons for NOT prescribing DVT Prophylaxis must be explicitly documented in the context of DVT Prophylaxis.

- Explicitly state your reasoning for not prescribing mechanical AND pharmacological DVT prophylaxis
- E.g. “Patient or family refuses,” or “Patient has GI bleeding risk and cellulitis of the lower extremities.”
STK-2: Discharged on Antithrombotic Therapy

Patients with ischemic stroke are prescribed antithrombotic agents at discharge to reduce stroke mortality and stroke-related morbidity.

<table>
<thead>
<tr>
<th>Antiplatelets</th>
<th>Anticoagulants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>Unfractionated Heparin IV</td>
</tr>
<tr>
<td>Aggrenox</td>
<td>Full Dose Low Molecular Weight Heparin</td>
</tr>
<tr>
<td>Plavix</td>
<td>Coumadin</td>
</tr>
<tr>
<td>Ticlid</td>
<td>Pradaxa</td>
</tr>
<tr>
<td></td>
<td>Argatroban</td>
</tr>
<tr>
<td></td>
<td>Arixtra (fondaparinux)</td>
</tr>
<tr>
<td></td>
<td>Xarelto (rivaroxaban)</td>
</tr>
<tr>
<td></td>
<td>Eliquis (apixaban)</td>
</tr>
<tr>
<td></td>
<td>Refldan (lepirudin)</td>
</tr>
</tbody>
</table>

Reasons for NOT prescribing Antithrombotic Therapy must be explicitly documented in the context of Antithrombotic Therapy

E.g. Allergy or Serious Side Effect, Aortic Dissection, Bleeding disorders or risk, Brain/CNS Cancer, Hemorrhagic CVA, Extensive/metastatic CA, Hemorrhage, any type, Intracranial Surgery/biopsy, Patient/Family refusal, Peptic Ulcer, Planned surgery within 7 days following discharge, Unrepaired intracranial aneurysm, Terminal illness, Other justified documented reasons by clinician.

Long Term Care or Nursing Home

- Patients who are not able to return to home and care for themselves
- Therapy Frequency—30-60 minutes/day, 1-3 days/week
- Skilled RN’s and Rehab RN’s may not be available
- Patient’s medical condition is relatively stable without expected complications

Home Care

- Patients who are exclusively home-bound and cannot leave and have good social support
- Skilled RN’s are available

Reasons for not ordering a Rehabilitation evaluation must be explicitly documented in the context of Rehabilitation evaluation.
STK-10: Assessed for Rehabilitation

Patients with Ischemic or Hemorrhagic Stroke, but receive Rehab assessment or services while admitted. This can include either Physical Therapy, Occupational Therapy, Speech/Swallow Therapy, Kinesiotherapy and Neuropsychology.

*If the patient had a TIA or Stroke with complete resolution of symptoms, explicitly document that Therapy is not indicated.

Acute Rehab Facility
- Patients require intensive therapy
- Therapy Frequency—>3 hours/day, 5-7 days/week
- Skilled RN’s are present 24 hours/day

Long Term Acute Rehab
- Patient needs intensive therapy, but is not ready to receive it due to other comorbidities—Will go to LTAR to manage and transition into intensive therapy
- Therapy Frequency—<3 hours/day, 5-7 days/week
- Length of Stay—>25 days
- Skilled RN’s present 24 hours/day

Subacute Rehab
- Patient cannot tolerate intensive therapy or not ready for it
- Therapy Frequency—<3 hours/day, 3-4 days/week
- Skilled RN’s may not be available 24 hours/day
- Patients are not significantly medically complicated

STK-3: Patients with Atrial Fibrillation/Flutter receive Anticoagulation Therapy

Patients with A.Fib/Flutter are at increased risk for stroke. This includes patients who have A.Fib/Flutter during the hospital stay, or patients who have a history of any A.Fib/Flutter, including P.A.F. and catheter ablation therapy for A.Fib/Flutter, documented in the medical record, even without evidence of A.Fib/Flutter during the current hospitalization.

*See Anticoagulants List from previous page

Reasons for NOT prescribing Anticoagulation Therapy must explicitly documented in the context of Anticoagulation Therapy.

*See Example from previous page
**STK-4: Thrombolytic Therapy Administered**

Acute stroke patients who arrive within 270 minutes (0-4.5 hours) of Time Last Known Well, should be screened for thrombolysis eligibility.

**Exclusion Criteria, Absolute—0 to 3 hours window**

1. Significant head trauma or prior stroke in the past 3 months
2. Symptoms suggest SAH
3. Arterial puncture at non-compressible site
4. History of previous ICH
5. Intracranial neoplasms, AV malformation or aneurysm
6. Recent intracranial or intraspinal surgery
7. Elevated SPB >185 and/or DBP > 110 at time of treatment despite appropriate therapy
8. Active internal bleeding <22 days
9. Platelet count < 100,000
10. Heparin received within 48 hours resulting in abnormally elevated PTT greater than the upper limit of normal
11. Current use of anticoagulant with INR > 1.7 or PT > 15 seconds
12. Current use of Direct Thrombin Inhibitors or direct Factor Xa Inhibitors with elevated sensitive lab tests (PTT, INR, Pll count, ecarin clotting time, Thrombin Time, or appropriate Factor Xa Activity assays)
13. Other active bleeding diatheses
14. Blood glucose concentration < 50
15. CT demonstrates multi-lobar infarction (hypodensity > 1/3 cerebral hemisphere)

**Exclusion Criteria, Relative—0-3 hours window**

1. Only minor or rapidly improving stroke symptoms
2. Pregnancy
3. Seizure at onset with post-ictal residual neurological impairments
4. Major surgery or serious trauma within the last 14 days
5. Recent GI or GU tract hemorrhage within last 21 days
6. Recent acute MI within the last 3 months

**STK-8: Stroke Education**

Patients with Ischemic or Hemorrhagic Stroke, or TIA, must receive Stroke Education twice during their admission. It must be documented in the EPIC Chart note that this education was given. Also, provide the patient and/or family members with Stroke Education Materials available on each unit or from the intranet.

**Education Points**

1. Activation of EMS
2. Follow-up after discharge
3. Medications prescribed at discharge
4. Risk factors for stroke
5. Warning signs and symptoms of stroke

**Reasons for not giving the education to the patient and/or family member/caregiver must be explicitly documented in the context of Stroke Education.**

**STK-9: Smoking Cessation Education**

Patients with Ischemic or Hemorrhagic Stroke, or TIA, who have smoked and/or used tobacco products within the last 12 months, must receive Smoking Cessation Counseling, and documentation in EPIC must reflect that this was given (documented on AVS).
**STK-7: Dysphagia Screening**

Patients with Ischemic or Hemorrhagic Stroke, or suspicion of Stroke, must be screened for dysphagia prior to receiving anything orally, e.g. medication, fluids, or food.

*Excludes TIA patients with explicit documentation of resolution of symptoms (NIHSS = 0)

**Dysphagia Screen**

1. Observe patient for overt signs of swallowing/speech difficulties
   - If Passes—perform Water Swallow Test
   - If Fails—NPO, order Speech/Swallow Therapy Consult

2. Water Swallow Test—Nurse performs and documents in flowsheet
   - If Pass—patient may resume PO status
   - If Fail—NPO, order Speech/Swallow Therapy Consult

**Tips**

- If patient NPO, ensure that medication orders are appropriate, e.g. ordered via DobHoff, rectal/IV administration, etc.
- In-House Strokes—be sure to perform a Dysphagia screen before resuming PO status (after symptom discovery and prior to anything else given PO, even if they were full PO prior to event)
- DO NOT resume PO status without ensuring that documentation in EPIC reflects a PASSED swallowing screen in the Flowsheet. Verbally communicated orders without documentation in EPIC do not suffice.

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**Exclusion Criteria, Absolute—3-4.5 hours window**

*See Exclusion Criteria, Absolute—0-3 hours window

**Exclusion Criteria, Relative—3-4.5 hours window**

*See Exclusion Criteria, Relative—0-3 hours window, AND...

1. Age > 80 years old
2. Sever stroke with NIHSS > 22
3. Taking an oral anticoagulant regardless of INR
4. History of both Diabetes and Prior Ischemic Stroke

**Reasons for NOT initiating IV tPA must be documented AND mentioned in the context of IV tPA AND fall on the contraindications Exclusion list(s), or from the choices below:**

1. Care team unable to determine eligibility
2. Glucose > 400
3. IV or IA tPA given at outside hospital
4. Left heart thrombus
5. Life expectancy < 1 year, significant comorbid illness, or Comfort Measures Only on admission
6. Patient/family refusal

**tPA**

Tissue Plasminogen Activator

Activase (alteplase) - 90mg/kg with a max. dose of 90mg

Bolus—10% total dose over 1 minute—Resident administers

Infusion—90% total dose over 1 hour—Nurse administers
STK-5: Antithrombotic Therapy by the End of Day 2

Patients with Ischemic Stroke receive antithrombotic therapy by the End of Day 2

*See Antiplatelet/Anticoagulant list on page 4

Tips

- Patients who received tPA on hospital Day 1 should have antithrombotics held for 24 hours post-tPA infusion completion. In the absence of contraindications for antithrombotic therapy, all patients should have antithrombotics administered before the end of Day 2.
- If patient is NPO, consider non-oral formulations of antithrombotics, e.g. rectal ASA, full-dose IV anticoagulants, etc.
- If you are a consulting service and your recommend ordering an antithrombotic, be sure that the attending service orders and administers this medication by the End of Day 2 with verbal and/or visual confirmation.

Reasons for not ordering Antithrombotic by the End of Day 2 must be explicitly documented in the context of Antithrombotic by the End of Day 2.

STK-6: Discharged on Statin Therapy

Patients with Ischemic Stroke with an LDL > 100 must be discharged on Intensive Statin Therapy. Patients with Ischemic Stroke with an LDL < 100 must be discharged on Regular Statin Therapy. LDL levels must be drawn either within the first 48 hours of admission, or within the last 30 days prior to admission, and these results must be documented in the chart note.

Intensive Statin Therapy

- Atorvastatin (Lipitor) 40mg or 80mg total daily dose
- Rosuvastatin (Crestor) 20mg or 40mg total daily dose
- Simvastatin* (Zocor) 80mg total daily dose
- Simvastatin*/Ezetimibe (Vytorin) 10/80mg dose
*Avoid/limit usage of simvastatin 80mg in new patients due to high incidence of myopathies, unless the patient has already been taking it for 12 months without myopathy.

Reasons for not ordering Statin therapy at discharge must be explicitly documented in the context of Discharge on Statin Therapy, such as those listed below:

1. Hepatic failure or hepatitis
2. Myalgias
3. Patient/family refusal
4. Rhabdomyolysis
5. Statin medication allergy
6. Documented lack of evidence for atherosclerosis