Acute Ischemic Stroke (AIS)
&
Transient Ischaemic Attack (TIA) Pathway

Patient details:	Height :_____cm Weight:_____Kg Body Mass Index :_____	**Provisional diagnosis** **Duration of previous hospitalization (if any)-** _____
Previous lab investigations if any:		

CO-MORBIDS	☐**Hypertension**	☐**AF**	☐**COPD**
	☐**Type 2 Diabetes Mellitus**	☐**Anticoagulation**	☐**CLD**
	☐**CAD**	☐**CKD**	☐**Recent Surgery**

Recognize

ROSIER Score
(Recognition Of Stroke In Emergency Room)

☐ (+1) Asymmetric face weakness	☐ (+1) Visual field defect
☐ (+1) Asymmetric arm weakness	☐ (-1) Seizure activity
☐ (+1) Asymmetric leg weakness	☐ (-1) Loss of consciousness or syncope
☐ (+1) Speech disturbance	
	Total (if the total score is +1 or more, or stroke is suspected on other clinical grounds.

☐ Score ≥1 - AIS

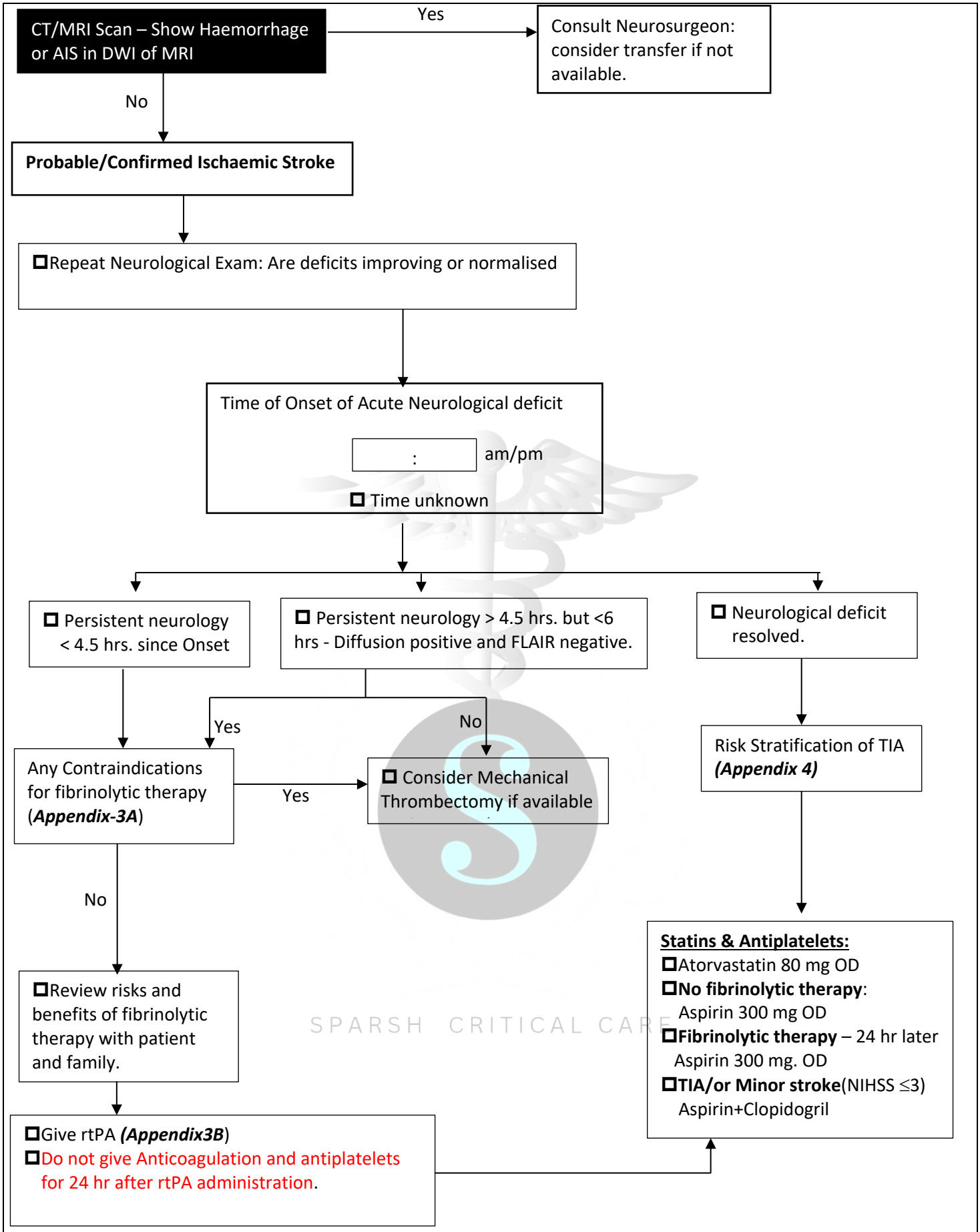
Immediate General Assessment and stabilization

☐A: Airway - Assess and maintain patent airway ☐ (ETI/MV)
☐B: Breathing - Assess and administer oxygen if required;
aim SpO 2 ≥ 95%
☐C: Circulation - Vascular access, blood collection,
- Send for Blood gluose/CBC/RFT/LFT/ /PT, INR, APTT
- Keep BP - <180/110mmHg (for fibrinolytic therapy and mechanical thrombectomy)
- *(BP management -**Appendix-1)***

☐Activate stroke team/Inform Neurology team.

Immediate Neurologic Assessment by Neurologist or designee

☐Review patient History, medications and procedures
☐Establish time of symptom onset or last known normal
☐Perform Neurological Examination – NIH Stroke Scale_____
(NIH Stroke Scale – ***Appendix-2***)



ICU Days	EVENTS / SUPPORTS
1	☐MV ☐RRT ☐Vasopressors ☐Organ dysfunction ☐Others
2	☐MV ☐RRT ☐Vasopressors ☐Organ dysfunction ☐Others
3	☐MV ☐RRT ☐Vasopressors ☐Organ dysfunction ☐Others
4	☐MV ☐RRT ☐Vasopressors ☐Organ dysfunction ☐Others
5	☐MV ☐RRT ☐Vasopressors ☐Organ dysfunction ☐Others
6	☐MV ☐RRT ☐Vasopressors ☐Organ dysfunction ☐Others
7	☐MV ☐RRT ☐Vasopressors ☐Organ dysfunction ☐Others
>7 days Course of illness	

Outcome

I. APACHE II/IV Score: _____ 2. SOFA Score at the time of admission:_____ , 48hr: _____ at the time of transfer out / LAMA / Discharge:_____ 3. Length of ICU Stay:_____ 4.Length of Hospital stay:____

II. Organ Failure : ☐AKI ☐Liver failure ☐Coagulopathy ☐Encephalopathy ☐Myocardial Dysfunction ☐CIPNM ☐MV dependent

III. Renal replacement therapy_____day from CRRT / SLED

IV. MV_____ duration ☐Proning ☐ECMO ☐Tracheostomy

V. Outcome: ☐Death ☐Survived (Discharged from ICU / Transfer out to stepdown / HDU/ Room) ☐LAMA

☐Ambulated ☐Bed ridden (with support / without support)

Doctor Name: _____, Sign: _____

Appendix 1:
Blood pressure management in AIS patients.(1)

If emergency reperfusion therapy is planned target BP - <185/<110 mmHg before treatment and <180/<105 for 24 hours after treatment

If no emergency reperfusion therapy is planned and BP is >220/<110 mmHg, lower BP by 15% during the first 24 hours after onset of stroke.

Patient otherwise eligible for emergency reperfusion therapy except that BP is >185/110 mm Hg:
Labetalol 10–20 mg IV over 1–2 min, may repeat 1 time; or
Nicardipine 5 mg/h IV, titrate up by 2.5 mg/h every 5–15 min, maximum 15 mg/h; when desired BP reached, adjust to maintain proper BP limits; or
Clevidipine 1–2 mg/h IV, titrate by doubling the dose every 2–5 min until desired BP reached; maximum 21 mg/h
Other agents (eg, hydralazine, enalaprilat) may also be considered
If BP is not maintained ≤185/110 mm Hg, do not administer alteplase
Management of BP during and after alteplase or other emergency reperfusion therapy to maintain BP ≤180/105 mm Hg:
Monitor BP every 15 min for 2 h from the start of alteplase therapy, then every 30 min for 6 h, and then every hour for 16 h
If systolic BP >180–230 mm Hg or diastolic BP >105–120 mm Hg:
Labetalol 10 mg IV followed by continuous IV infusion 2–8 mg/min; or
Nicardipine 5 mg/h IV, titrate up to desired effect by 2.5 mg/h every 5–15 min, maximum 15 mg/h; or
Clevidipine 1–2 mg/h IV, titrate by doubling the dose every 2–5 min until desired BP reached; maximum 21 mg/h
If BP not controlled or diastolic BP >140 mm Hg, consider IV sodium nitroprusside

Appendix 2:
National Institute of Health Stroke scale (NIHSS)

Tested Item	Title	Responses and Scores
1A	Level of consciousness	0—Alert
		1—Drowsy
		2—Obtunded
		3—Coma/unresponsive
1B	Orientation questions (2)	0—Answers both correctly
		1—Answers 1 correctly
		2—Answers neither correctly
1C	Response to commands (2)	0—Performs both tasks correctly
		1—Performs 1 task correctly
		2—Performs neither
2	Gaze	0—Normal horizontal movements
		1—Partial gaze palsy
		2—Complete gaze palsy
3	Visual fields	0—No visual field defect
		1—Partial hemianopia
		2—Complete hemianopia
		3—Bilateral hemianopia
4	Facial movement	0—Normal
		1—Minor facial weakness
		2—Partial facial weakness
		3—Complete unilateral palsy
5	Motor function (arm)	0—No drift
	a. Left	1—Drift before 10 s
	b. Right	2—Falls before 10 s
		3—No effort against gravity
		4—No movement
6	Motor function (leg)	0—No drift
	a. Left	1—Drift before 5 s
	b. Right	2—Falls before 5 s
		3—No effort against gravity
		4—No movement
7	Limb ataxia	0—No ataxia
		1—Ataxia in 1 limb
		2—Ataxia in 2 limbs
8	Sensory	0—No sensory loss
		1—Mild sensory loss
		2—Severe sensory loss
9	Language	0—Normal
		1—Mild aphasia
		2—Severe aphasia
		3—Mute or global aphasia
10	Articulation	0—Normal
		1—Mild dysarthria
		2—Severe dysarthria
11	Extinction or inattention	0—Absent
		1—Mild loss (1 sensory modality lost)
		2—Severe loss (2 modalities lost)

Adapted from Lyden et al.[74] Copyright © 1994, American Heart Association, Inc.

Appendix 3:
Appendix 3A:
Fibrinolytic Contraindications (No benefit and/ or Harm)(1)

0- to 3-h window–Mild nondisabling stroke	For otherwise eligible patients with mild nondisabling stroke (NIHSS score 0–5), IV alteplase is not recommended for patients who could be treated within 3 h of ischemic stroke symptom onset or patient last known well or at baseline state. (*COR III: No Benefit, LOE B-R*)‡
3- to 4.5-h window–Mild nondisabling stroke	For otherwise eligible patients with mild nondisabling stroke (NIHSS score 0–5), IV alteplase is not recommended for patients who could be treated within 3 and 4.5 h of ischemic stroke symptom onset or patient last known well or at baseline state. (*COR III: No Benefit, LOE C-LD*)‡
CT	There remains insufficient evidence to identify a threshold of hypoattenuation severity or extent that affects treatment response to alteplase. However, administering IV alteplase to patients whose CT brain imaging exhibits extensive regions of clear hypoattenuation is not recommended. These patients have a poor prognosis despite IV alteplase, and severe hypoattenuation defined as obvious hypodensity represents irreversible injury.† (*COR III: No Benefit; LOE A*)‖
ICH	IV alteplase should not be administered to a patient whose CT reveals an acute intracranial hemorrhage.† (*COR III: Harm; LOE C-EO*)§‖
Ischemic stroke within 3 mo	Use of IV alteplase in patients presenting with AIS who have had a prior ischemic stroke within 3 mo may be harmful.† (*COR III: Harm; LOE B-NR*)§‖
Severe head trauma within 3 mo	In AIS patients with recent severe head trauma (within 3 mo), IV alteplase is contraindicated.† (*COR III: Harm; LOE C-EO*)§‖
Acute head trauma	Given the possibility of bleeding complications from the underlying severe head trauma, IV alteplase should not be administered in posttraumatic infarction that occurs during the acute in-hospital phase.† (*COR III: Harm; LOE C-EO*)§‖ (Recommendation wording modified to match COR III stratifications.)
Intracranial/intraspinal surgery within 3 mo	For patients with AIS and a history of intracranial/spinal surgery within the prior 3 mo, IV alteplase is potentially harmful.† (*COR III: Harm; LOE C-EO*)§‖
History of intracranial hemorrhage	IV alteplase administration in patients who have a history of intracranial hemorrhage is potentially harmful.† (*COR III: Harm; LOE C-EO*)§‖
Subarachnoid hemorrhage	IV alteplase is contraindicated in patients presenting with symptoms and signs most consistent with an SAH.† (*COR III: Harm; LOE C-EO*)§‖
GI malignancy or GI bleed within 21 d	Patients with a structural GI malignancy or recent bleeding event within 21 d of their stroke event should be considered high risk, and IV alteplase administration is potentially harmful.† (*COR III: Harm; LOE C-EO*)§‖
Coagulopathy	The safety and efficacy of IV alteplase for acute stroke patients with platelets <100 000/mm^3, INR >1.7, aPTT >40 s, or PT >15 s are unknown, and IV alteplase should not be administered.† (*COR III: Harm; LOE C-EO*)§‖ (In patients without history of thrombocytopenia, treatment with IV alteplase can be initiated before availability of platelet count but should be discontinued if platelet count is <100 000/mm^3. In patients without recent use of OACs or heparin, treatment with IV alteplase can be initiated before availability of coagulation test results but should be discontinued if INR is >1.7 or PT is abnormally elevated by local laboratory standards.) (Recommendation wording modified to match COR III stratifications.)
LMWH	IV alteplase should not be administered to patients who have received a full treatment dose of LMWH within the previous 24 h.† (*COR III: Harm; LOE B-NR*)§‡ (Recommendation wording modified to match COR III stratifications.)
Thrombin inhibitors or factor Xa inhibitors	The use of IV alteplase in patients taking direct thrombin inhibitors or direct factor Xa inhibitors has not been firmly established but may be harmful.† (*COR III: Harm; LOE C-EO*)§‖ IV alteplase should not be administered to patients taking direct thrombin inhibitors or direct factor Xa inhibitors unless laboratory tests such as aPTT, INR, platelet count, ecarin clotting time, thrombin time, or appropriate direct factor Xa activity assays are normal or the patient has not received a dose of these agents for >48 h (assuming normal renal metabolizing function). (Alteplase could be considered when appropriate laboratory tests such as aPTT, INR, ecarin clotting time, thrombin time, or direct factor Xa activity assays are normal or when the patient has not taken a dose of these ACs for >48 h and renal function is normal.) (Recommendation wording modified to match COR III stratifications.)
Concomitant Abciximab	Abciximab should not be administered concurrently with IV alteplase. (*COR III: Harm; LOE B-R*)‡
Concomitant IV aspirin	IV aspirin should not be administered within 90 min after the start of IV alteplase. (*COR III: Harm; LOE B-R*)‡
Infective endocarditis	For patients with AIS and symptoms consistent with infective endocarditis, treatment with IV alteplase should not be administered because of the increased risk of intracranial hemorrhage.† (*COR III: Harm; LOE C-LD*)§‖ (Recommendation wording modified to match COR III stratifications.)
Aortic arch dissection	IV alteplase in AIS known or suspected to be associated with aortic arch dissection is potentially harmful and should not be administered.† (*COR III: Harm; LOE C-EO*)§‖ (Recommendation wording modified to match COR III stratifications.)
Intra-axial intracranial neoplasm	IV alteplase treatment for patients with AIS who harbor an intra-axial intracranial neoplasm is potentially harmful.† (*COR III: Harm; LOE C-EO*)§‖

3B: Alteplase dose:

Infuse 0.9 mg/kg (maximum dose 90 mg) over 60 min, with 10% of the dose given as a bolus over 1 min.
Admit the patient to an intensive care or stroke unit for monitoring.
If the patient develops severe headache, acute hypertension, nausea, or vomiting or has a worsening neurological examination, discontinue the infusion (if IV alteplase is being administered) and obtain emergency head CT scan.
Measure BP and perform neurological assessments every 15 min during and after IV alteplase infusion for 2 h, then every 30 min for 6 h, then hourly until 24 h after IV alteplase treatment.
Increase the frequency of BP measurements if SBP is >180 mm Hg or if DBP is >105 mm Hg; administer antihypertensive medications to maintain BP at or below these levels **(Appendix 1)**
Delay placement of nasogastric tubes, indwelling bladder catheters, or intra-arterial pressure catheters if the patient can be safely managed without them.
Obtain a follow-up CT or MRI scan at 24 h after IV alteplase before starting anticoagulants or antiplatelet agents.

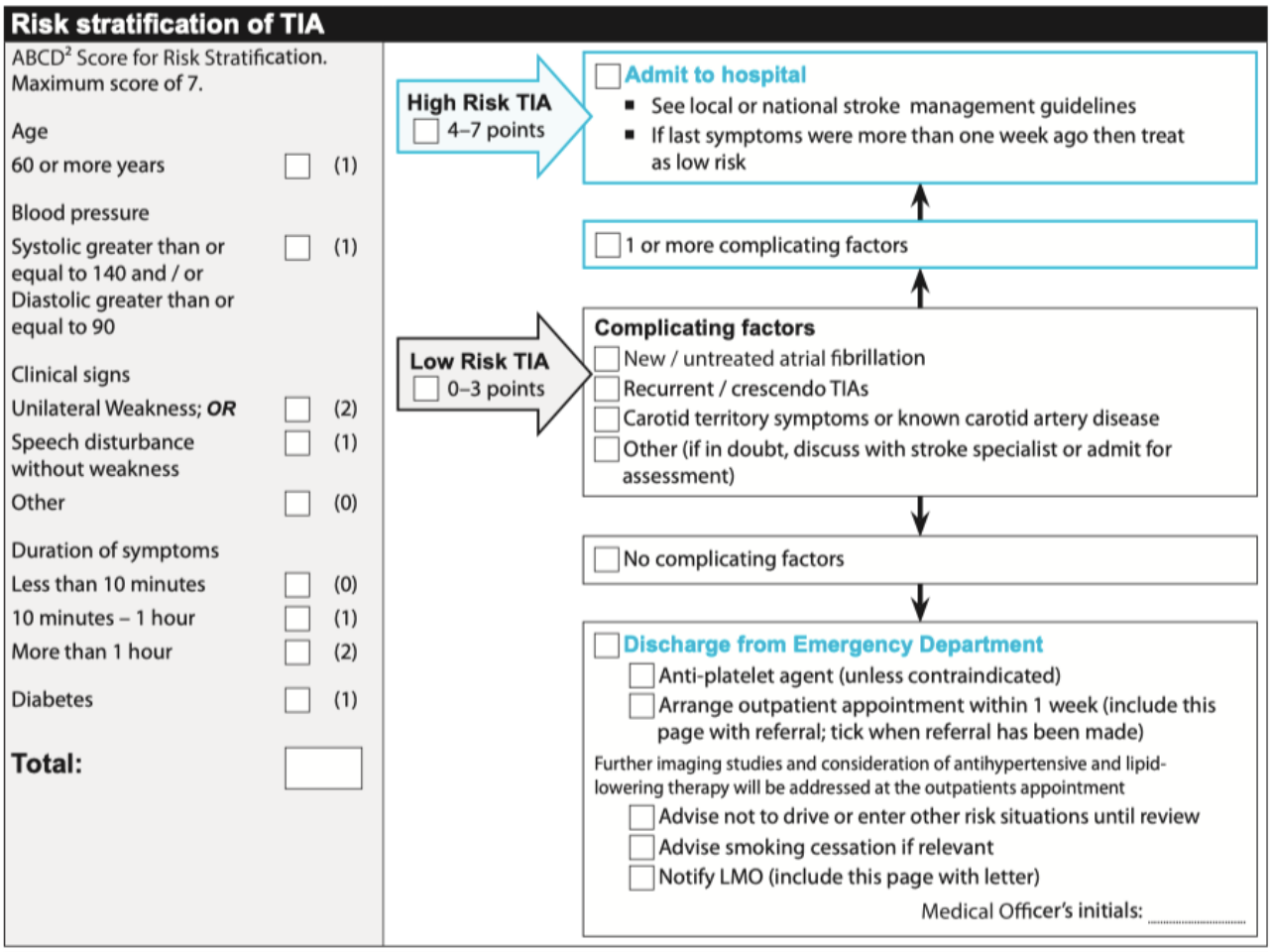
Or

Tenectaplase dose – 0.25 mg/Kg (Maximum 25 mg) IV bolus can be considered as an alternative.

Appendix 3C:
Management of Symptomatic Intracranial Bleeding Occurring within 24 hr of administration of Alteplase as treatment for AIS.(1)

Stop alteplase infusion
CBC, PT (INR), aPTT, fibrinogen level, and type and cross-match
Emergent nonenhanced head CT
Cryoprecipitate (includes factor VIII): 10 U infused over 10–30 min (onset in 1 h, peaks in 12 h); administer additional dose for fibrinogen level of <150 mg/dL
Tranexamic acid 1000 mg IV infused over 10 min OR ε-aminocaproic acid 4–5 g over 1 h, followed by 1 g IV until bleeding is controlled (peak onset in 3 h) (Potential for benefit in all patients, but particularly when blood products are contraindicated or declined by patient/family or if cryoprecipitate is not available in a timely manner.)
Hematology and neurosurgery consultations
Supportive therapy, including BP management, ICP, CPP, MAP, temperature, and glucose control

Appendix 4:



Risk stratification of TIA

ABCD² Score for Risk Stratification. Maximum score of 7.

Age
- 60 or more years ☐ (1)

Blood pressure
- Systolic greater than or equal to 140 and / or Diastolic greater than or equal to 90 ☐ (1)

Clinical signs
- Unilateral Weakness; ***OR*** ☐ (2)
- Speech disturbance without weakness ☐ (1)
- Other ☐ (0)

Duration of symptoms
- Less than 10 minutes ☐ (0)
- 10 minutes – 1 hour ☐ (1)
- More than 1 hour ☐ (2)

Diabetes ☐ (1)

Total: ☐

High Risk TIA ☐ 4–7 points

☐ **Admit to hospital**
- See local or national stroke management guidelines
- If last symptoms were more than one week ago then treat as low risk

☐ 1 or more complicating factors

Low Risk TIA ☐ 0–3 points

Complicating factors
- ☐ New / untreated atrial fibrillation
- ☐ Recurrent / crescendo TIAs
- ☐ Carotid territory symptoms or known carotid artery disease
- ☐ Other (if in doubt, discuss with stroke specialist or admit for assessment)

☐ No complicating factors

☐ **Discharge from Emergency Department**
- ☐ Anti-platelet agent (unless contraindicated)
- ☐ Arrange outpatient appointment within 1 week (include this page with referral; tick when referral has been made)

Further imaging studies and consideration of antihypertensive and lipid-lowering therapy will be addressed at the outpatients appointment
- ☐ Advise not to drive or enter other risk situations until review
- ☐ Advise smoking cessation if relevant
- ☐ Notify LMO (include this page with letter)

Medical Officer's initials: .....

Medication recommendations for patients discharged from ED (all to be given orally)

Drug	Dose	Comments
Aspirin	100mg once daily	***All patients*** in whom haemorrhage has been excluded with CT or MRI brain (unless contraindicated) Dual antiplatelet therapy asprin and clopidogrel is recommended for three weeks, then reduce to single agent (either aspirin or clopidogrel) life long.
Clopidogrel	75 mg once daily	

- If the patient is in atrial fibrillation, commence appropriate oral anti-coagulant agent.

Reference:

1. Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, et al. Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. Stroke. 2019;50(12):e344-e418.

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