Brain Summit 2026 Cerebrovascular Diseases & Brain Health

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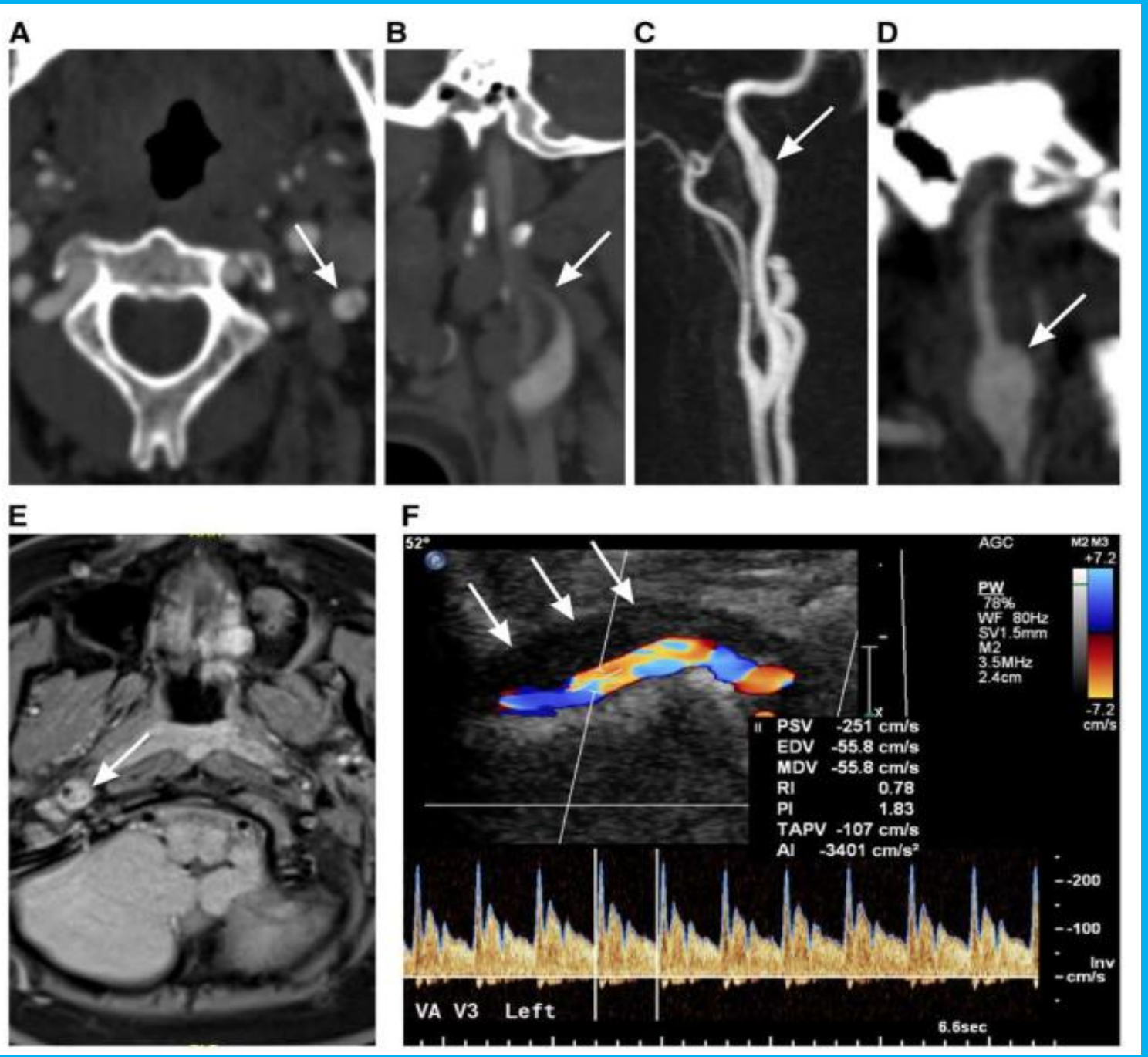
Cerebrovascular Diseases and Stroke Section

Items to be covered & I have no disclosures

- New but not so recent
  - Term “CVA” is now defunct
  - Cervico-Cerebral Arterial dissection
- Acute Ischemic Stroke
- Pediatric Stroke Care
- Treatment Medications and Interventions
- NeuroRehabilitation

New but not so recent

- The term Cerebrovascular Accident (CVA) has been phased out
  - It is not considered and “accident” is considered largely preventable and treatable.
  - It is not specific. Rather consider ischemic stroke or hemorrhagic stroke.
  - The ICD 11 which came out in 2022 the term CVA was removed, and it explicitly uses the term “stroke” with specific clinical descriptions.
  - This ICD 11 change coincided with the reclassification of cerebrovascular disease from diseases of the circulatory system to Diseases of the Nervous System which acknowledges that stroke causes a primary brain dysfunction rather than just a vascular issue.

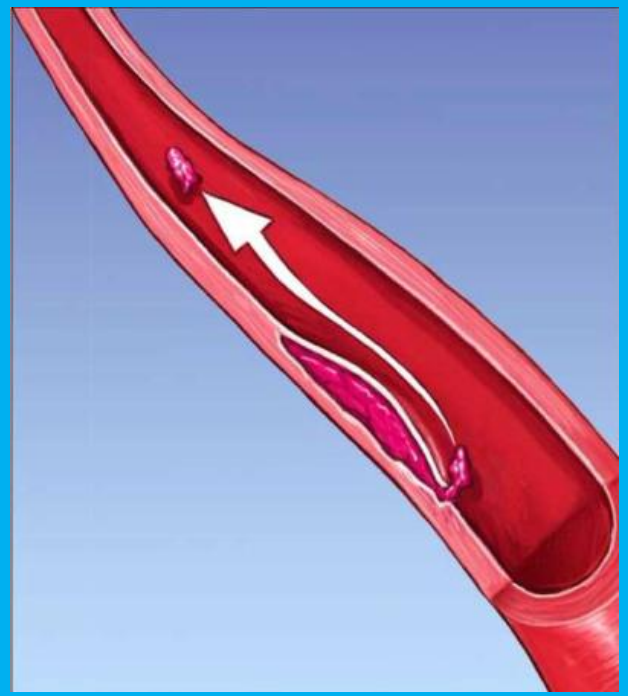


Also New But not so recent...

Cervico-Cerebral Artery Dissection

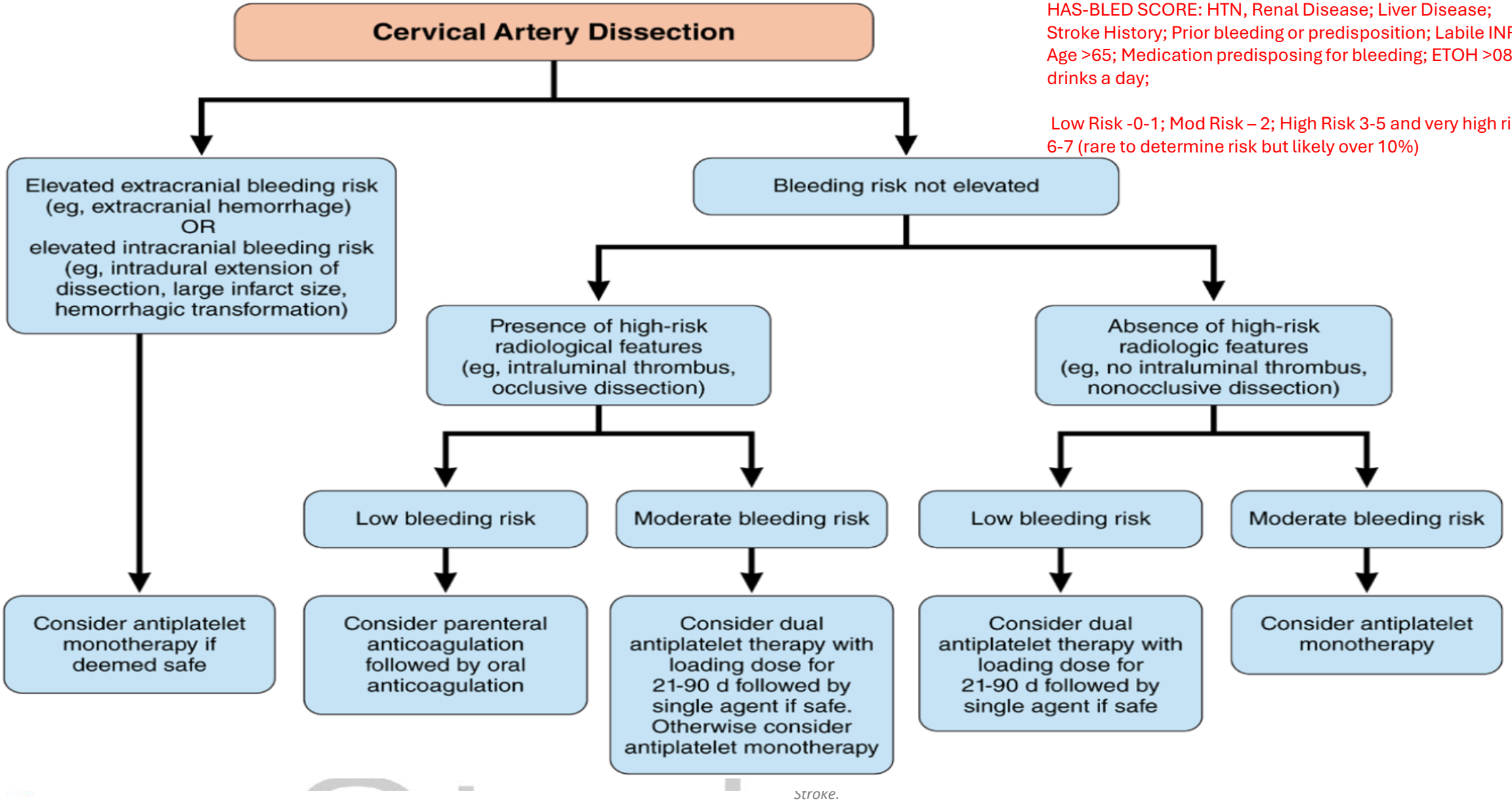
Treatment and Outcomes of Cervical Artery Dissection in Adults: Sci Sta; Stroke 2024: 55

Cervical Arterial Dissections and Association with Cervical Manipulative Therapy. Stroke 2014



Treatment and Outcomes of Cervical Artery Dissection in Adults: A Scientific Statement

Stroke. 2024;55



HAS-BLED SCORE: HTN, Renal Disease; Liver Disease; Stroke History; Prior bleeding or predisposition; Labile INR; Age >65; Medication predisposing for bleeding; ETOH >08 drinks a day;

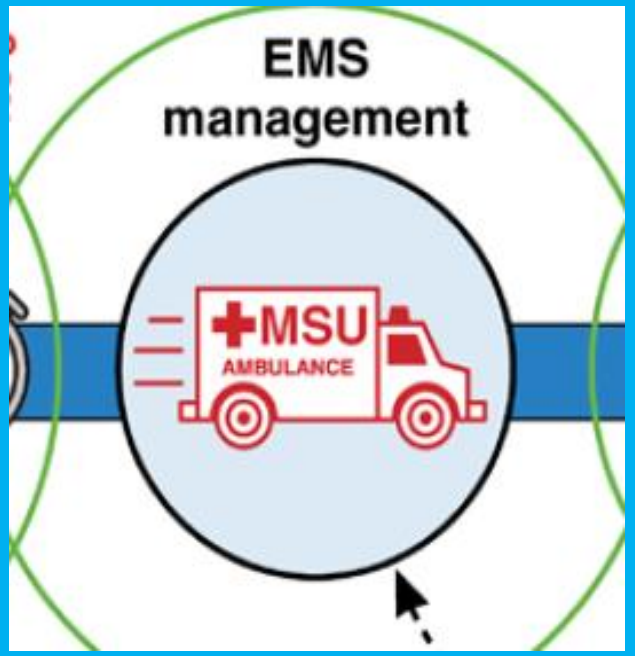
Low Risk -0-1; Mod Risk – 2; High Risk 3-5 and very high risk 6-7 (rare to determine risk but likely over 10%)

Stroke.

Acute Ischemic Stroke – ASA/AHA 2026 Guidelines
Pre-Hospital Management

Need for Rapid Care Before arriving to the hospital

- **Hospital and EMS should establish agreements and protocols for priority interhospital transfer and to reduce door-in-door out (DIDO) times – Class 1**
- **Mobile stroke units are recommended over conventional EMS for transport and management of thrombolytic eligible patients to provide faster triage for thrombolysis delivery and better functional outcomes where available – Class 1**
- **For EMS-identified suspected LVO in areas with rapid local access direct transport to a CSC/TSC can be beneficial (with higher EVT rates, faster tx) against initial transport to a non TSC with planned secondary transfer* – Class 2a**
    - *This depends on the regional network characteristics since well coordinated systems of care this may not apply and the above routing may be harmful



Acute Ischemic Stroke- ASA/AHA 2026 Guidelines
IV Thrombolysis (IVT)

Thrombolysis Eligibility – if </= NIHSS 5 then…

- **Non-Disabling – DAPT is recommended** – Class 3: within 4.5 , IVT is not recommended
  - Does not limit ADLs or return to work
  - Isolated Facial Droop
  - Mild cortical hand weakness (especially nondominant, NIHSS 0), mild hemi-motor loss
  - Hemi-sensory loss
  - Mild hemi-sensorimotor loss
  - Mild hemiataxia

- **Disabling – Thrombolysis Recommended**
  - Complete Hemianopsia (>/= 2)
  - Severe Aphasia (>/=2)
  - Severe Extinction (>/=2)
  - Any Weakness limiting sustained effort against gravity (>/= 2)

BATHE MNEMONIC – Bathing/dressing, Ambulating, Toileting, Hygiene, Eating – To fully evaluate include ability to ambulate & Swallow
All done in consultation with patient and available family

Acute Ischemic Stroke- ASA/AHA 2026 Guidelines
IV Thrombolysis (IVT)

Thrombolysis Eligibility – weighing benefits vs risk assessments

- **Benefits>Risks**

-Stroke mimics

-Unruptured Aneurysms

-Post angiography

-Extracranial Dissections

-Prior GI/GU bleed

- **Benefits = Risks**

-Active Malignancy

-Recent MI/ICH

-DOAC <48 hrs

-Pre-existing frailty

-Pregnancy

Benefits < Risks

-Infective Endocarditis

-Coagulopathy

-Severe TBI/neurosurgery < 14 d

-Extensive hypodensity or hemorrhage on CT

Acute Ischemic Stroke – ASA/AHA 2026 Guidelines
IV Thrombolysis (IVT)

Alteplase and Tenecteplase now are felt standard recommended treatment within 4.5 hours with Alteplase having lost ground in clinical practice – TNK non inferior(table borrowed from lecture in WSC 2026)

- Tiered weight-based dosage given with single IV bolus which allow for shorter DTN & DIDO times

Tenecteplase: Push 0.25 mg/kg (up to maximum 25 mg) based on patient body weight†:		
Patient weight (kg)	**TNK (mg)**	**Volume TNK to be administered (mL)**
<60 kg	15	3
60 kg to <70 kg	17.5	3.5
70 kg to <80 kg	20	4
80 kg to <90 kg	22.5	4.5
≥90 kg	25	5

Trial	Subjects	Dose Used	mRS 0-1 (%)	sICH (%)
NOR TEST 2 A	N-216	0.40	32 VS 51	6/1
ACT	N-1600	0.25	32 vs 35	3/3
TRACE-2	N-1430	0.25	62 VS 58	2/2
ATTEST-2	N-1777	0.25	43 vs 37	2/2
TASTE	N-680	0.25	57 VS 55	3/2
ORIGINAL	N-1465	0.25	73 VS 70	1/1
EXTEND-IA TNK	N-202	0.25	49 VS 41	1/1

Acute Ischemic Stroke: Extended Time Windows Imaging Selected IV Thrombolysis

2026 Guidelines for the Early Management of Acute Ischemic Stroke ASA/AHA

COR 2a & LOE B-R

- **In patients with AIS who**
  - Have unknown time of onset, are within 4.5 hours from symptom recognition, have an MRI-DWI lesion smaller than one-third of the MCA territory and no marked signal change on FLAIR
    - IVT can be beneficial to improve functional outcomes
      - COR 2a & LOE B-R

- **In patients with AIS who have salvageable ischemic penumbra detected on automated perfusion imaging and who**
  - (a) awake with stroke symptoms within 9 hours from the midpoint of sleep **or**
  - (b) are 4.5–9 hours from last known well, IV thrombolysis
    - may be reasonable to improve functional outcomes

COR 2b & LOE B-R

- **In patients with AIS due to LVO with salvageable ischemic penumbra, presenting within 4.5 to 24 hours from symptom onset or last known well, and who cannot receive EVT**
- Treatment with IVT directed by individuals with expertise in thrombolytic care may be beneficial to improve functional outcomes

- Trials Published:
- **1**. 2018 – **WAKE-UP** – NEJM; **2**. 2019 – **EXTEND** – NEJM; **3**. 2024 - **TRACE-III** NEJM; **4**. 2025 – **HOPE** –JAMA;
- **5**. 2026 – **OPTION** - JAMA

Acute Ischemic Stroke: ASA/AHA 2026 Guidelines and Beyond

Extended Window IVT in combination with expedited Endovascular Thrombectomy (EVT)

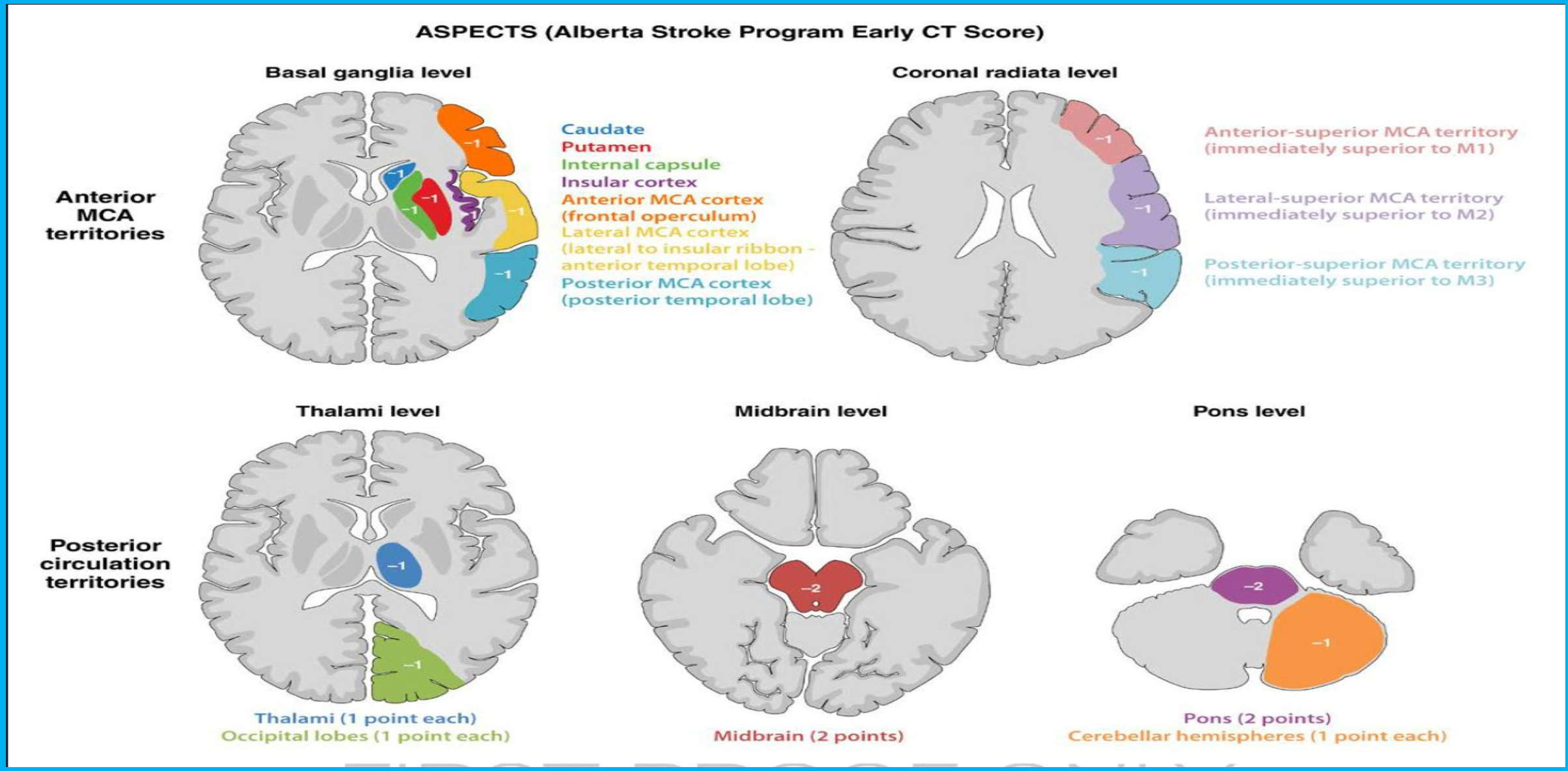
- 2024 – TIMELESS – NEJM
  - TNK 4.5-24 h; ICA/M1 occlusion; **TNK to EVT was 15 m**
  - N=458; mRS shift neutral (adj cOR 1.13)*
  - *Published before Guidelines and on the right side published after guidelines
- 2026 – TNK-PLUS – JAMA
  - TNK 4.5-24 h, proximal MCA occlusion; **TNK to EVT was 26 m**
  - N=391; mRS 0-2; 44% vs 43% (RR 1.01)
- 2026 – ATTENTION-LATE – JAMA
  - TNK 4.5-24 h, basilar occlusion; **TNK to EVT was 12 m**
  - N=330; mRS 0-2; 30.3% vs 30.5% (adj RR 0.92)

These trials tested IVT Prior to EVT in the 4.5-24 hours window with two of them after the guidelines were published.

Late window IVT is likely beneficial if EVT is not planned (or delayed) **but not beneficial in conjunction with Rapid EVT**

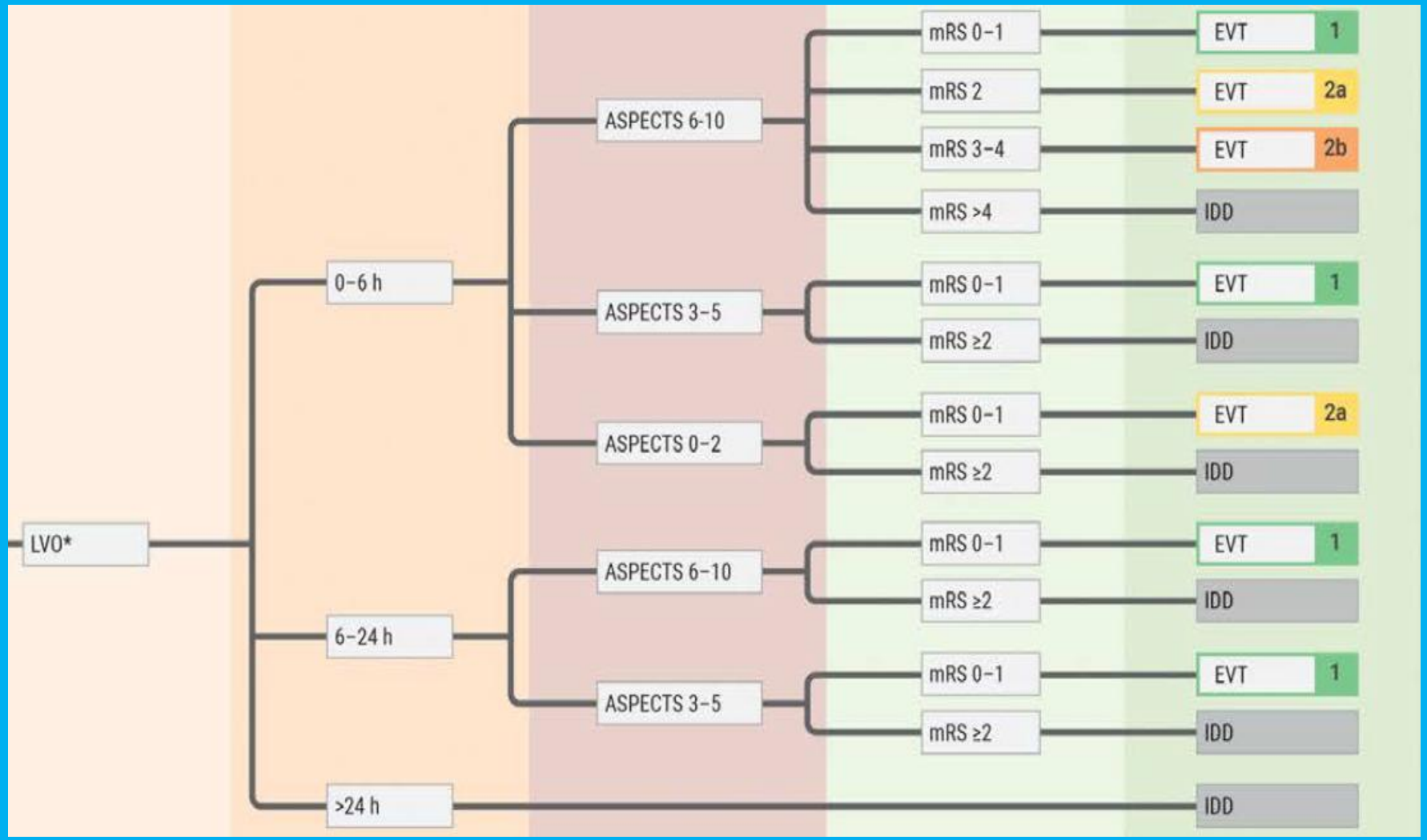
Of note these trials did not enrolled patients being transferred for thrombectomy (or delayed EVT) – Drip-and-ship in the late window still needs further studies.

Acute Ischemic Stroke
ASPECTS Score



Endovascular Thrombectomy (EVT)

Large Vessel Occlusion (LVO)



Class 1 Recommendation

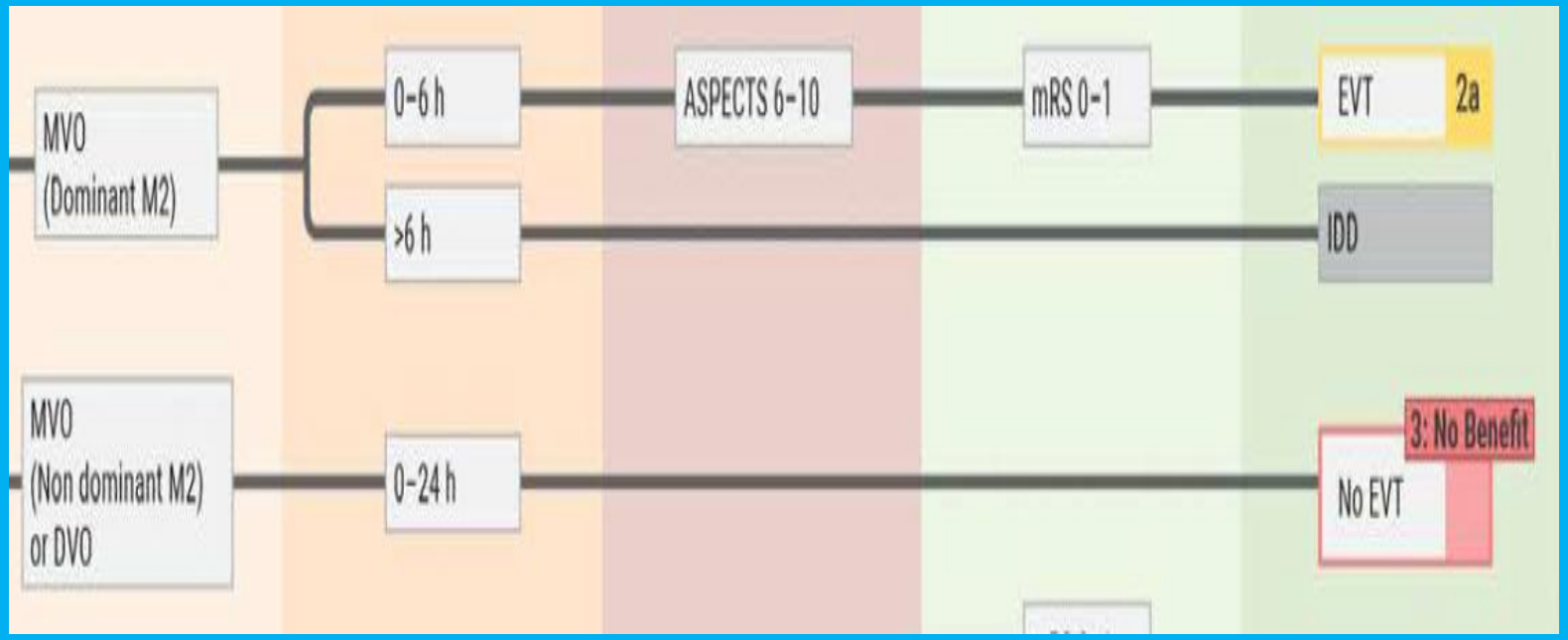
1. 0-6 h onset ASPECTS 3-10 Recommended
2. 6-24 h, ASPECTS =/> 6 recommended
3. 6-24 h, ASPECTS 3-5 (large Core), age <80, no significant mass effect EVT recommended

Class 2a Recommendation

1. 0-6h, age <80, ASPECTS 0-2 Without significant mass Effect; EVT reasonable. ASPECTS =/> 6 with prestroke mRS 2; EVT reasonable

Endovascular Thrombectomy (EVT)

Medium Vessel Occlusion (MVO) – Data evolving and original Class III recommendations may change due to improving technology



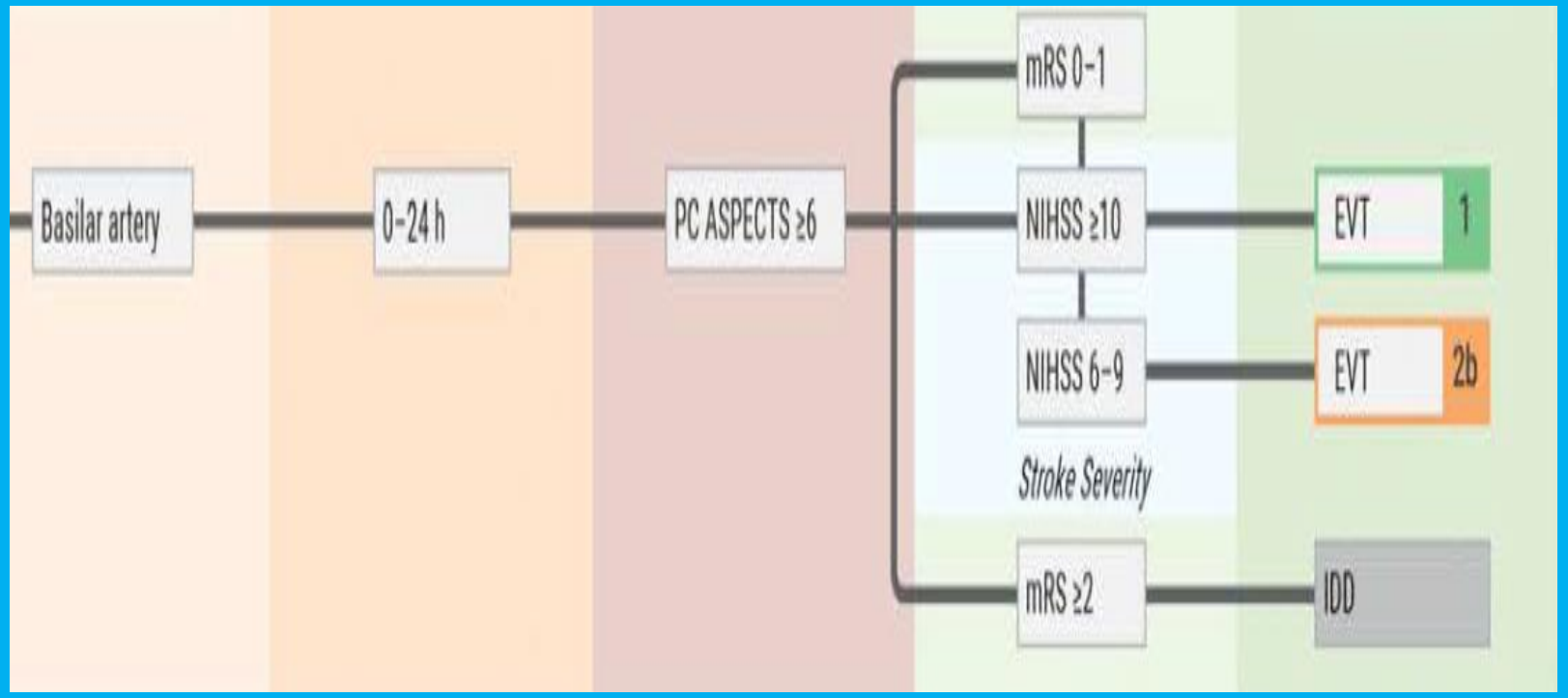
Neutral Trials –
Recent Guideline Recomendations

But they are likely to change

1. 2025 – ESCAPE-MeVO – NEJM*
2. 2025 – DISTAL – NEJM & Lancet Neuro*
3. 2026 – DISCOUNT – JAMA*
4. 2026 – ORIENTAL-MeVO – NEJM
5. 2026 – DISTALS – ISC 2026 Abstracts

* As of May 2025 three randomized controlled trials showed no benefit and signal for harm

Update for Posterior Circulation



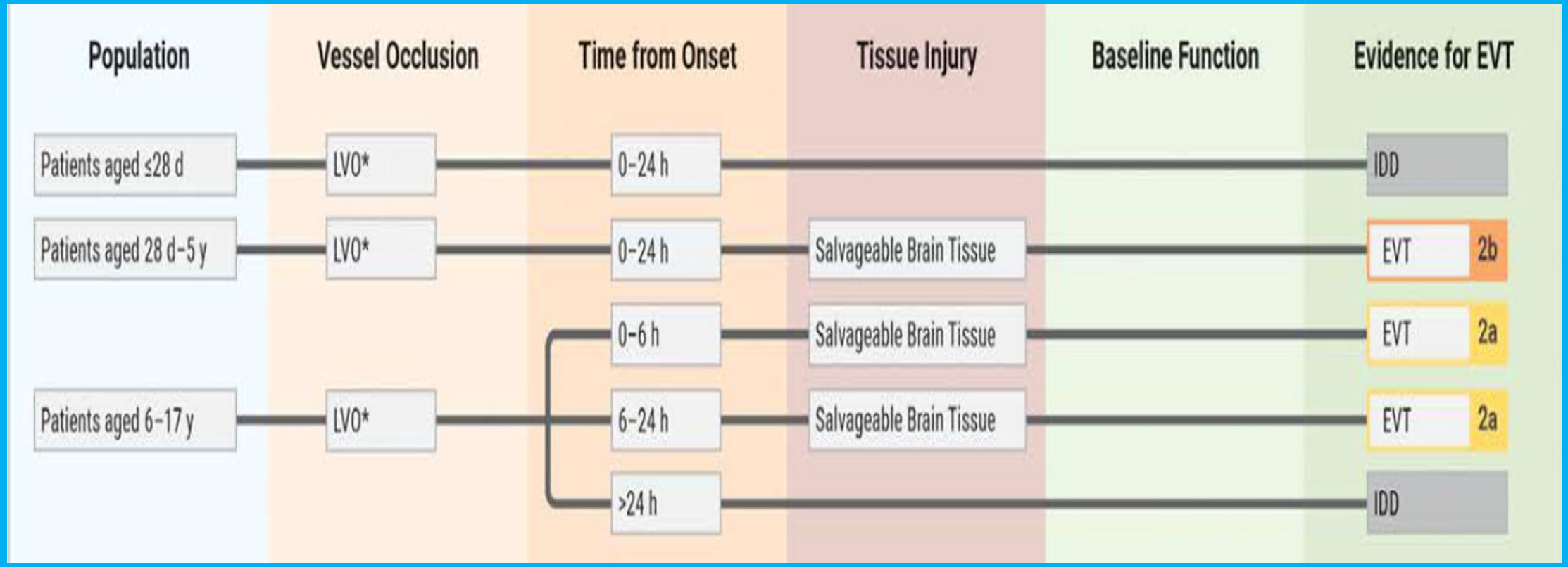
Class 1 Recommendation
Within 24 hrs; PC-ASPECTS =/> 6
NIHSS=/> 10 and mRS 0-1
EVT Recommended

Class 2b is not as well established
Within 24 hrs; PC-ASPECTS =/> 6
NIHSS 6-9

Acute Ischemic Stroke: Pediatric Stroke Care

Pediatric stroke formally included in 2026 guidelines, with guidance on imaging, registries, and Tx

2026 Guideline for the Early Management of Acute Ischemic Stroke ASA/AHA



Based on not on RCTs but consensus & strong observational data; with retrospective data suggesting relatively low Rates of sICH; with efficacy data limited; there are atypical and delayed presentation with high rate of stroke mimics and frequent contraindications

Acute Ischemic Stroke – 2026 ASA/AHA Guidelines

Adjunctive Anticoagulation

Class III Recommendation – No Benefit

- 1. Adjunctive IV eptifibatide with IVT (< 3 h) not recommended to reduce disability
- 2. Adjunctive Argatroban to IVT (< 3h) is not effective for improving functional outcomes
- 3. Pre-Thrombectomy tirofiban does not improve 90-day functional outcome (RESCUE BT trial)

Acute Ischemic Stroke treatment Protocols Glucose & BP

Glucose

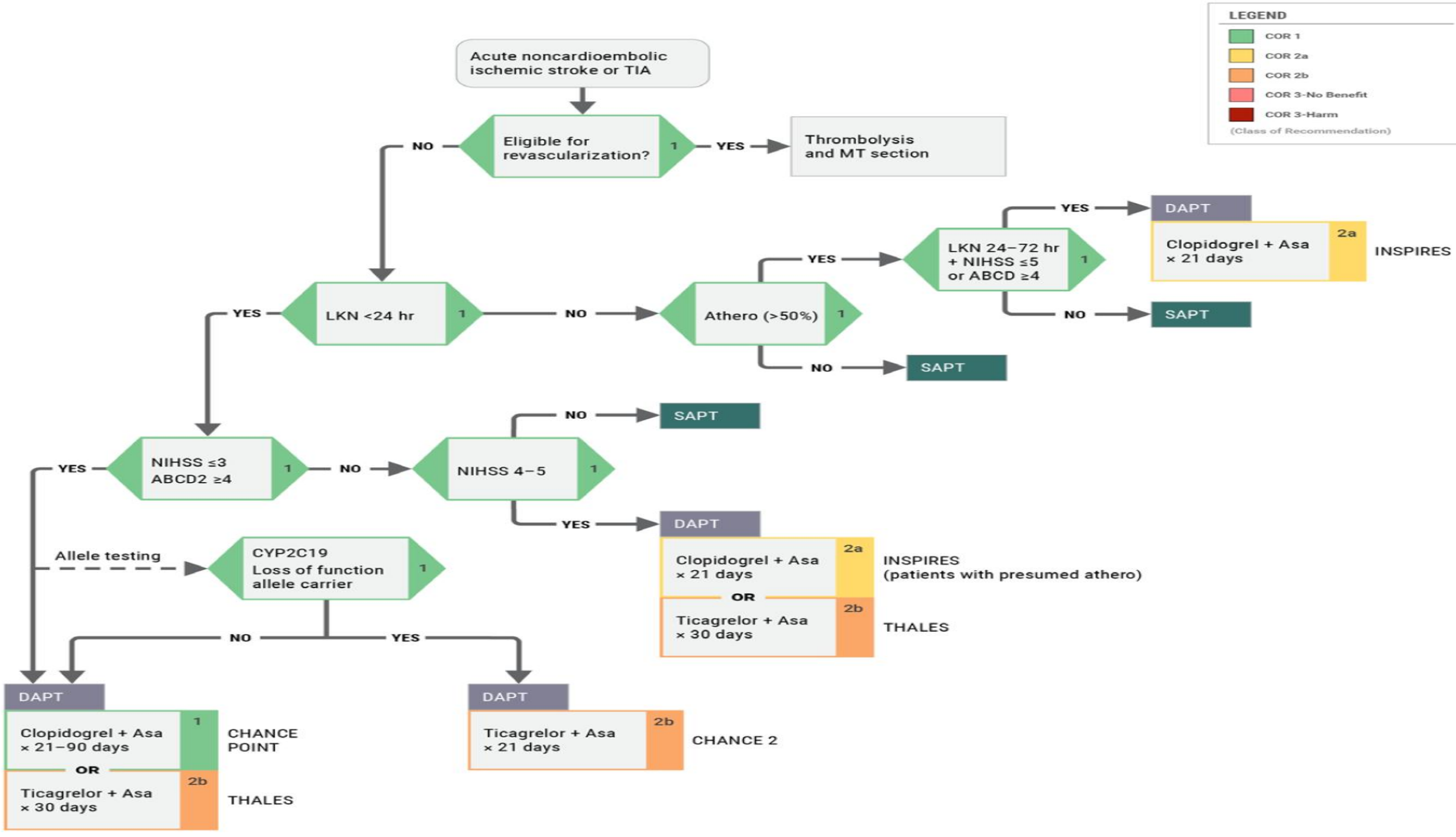
- Target hypoglycemia (< 60 mg/dl – COR 1)
- IV Insulin to 80-130 mg/dL – no benefit – COR 3)
- Hyperglycemia target 140-180 mg/dl – COR 2a)

Blood pressure

- After IVT SBP < 140 mm Hg – COR 3 No benefit
- After EVT (mTICI 2b-3) SBP < 140 mm/Hg – COR 3 Harm

Dual Antiplatelet Agent

- There is a stronger emphasis for its use in non-disabling acute ischemic strokes vs intravenous thrombolysis
- Potential future change: In patients with ICAS/ICAD there could be a chance in practice for treatment longer than 3 months (perhaps 12 months)


LEGEND
COR 1
COR 2a
COR 2b
COR 3-No Benefit
COR 3-Harm
(Class of Recommendation)
Acute noncardioembolic ischemic stroke or TIA
Eligible for revascularization?
1
NO
YES
Thrombolysis and MT section
LKN <24 hr
1
YES
NO
Athero (>50%)
1
YES
NO
LKN 24–72 hr + NIHSS ≤5 or ABCD ≥4
1
YES
NO
DAPT
Clopidogrel + Asa × 21 days
2a
INSPIRES
SAPT
SAPT
NIHSS ≤3 ABCD2 ≥4
1
YES
NO
NIHSS 4–5
1
NO
YES
DAPT
Clopidogrel + Asa × 21 days
2a
OR
Ticagrelor + Asa × 30 days
2b
INSPIRES (patients with presumed athero)
THALES
Allele testing
CYP2C19 Loss of function allele carrier
1
NO
YES
DAPT
Clopidogrel + Asa × 21–90 days
1
OR
Ticagrelor + Asa × 30 days
2b
CHANCE POINT
THALES
DAPT
Ticagrelor + Asa × 21 days
2b
CHANCE 2

New Antithrombotic Agent

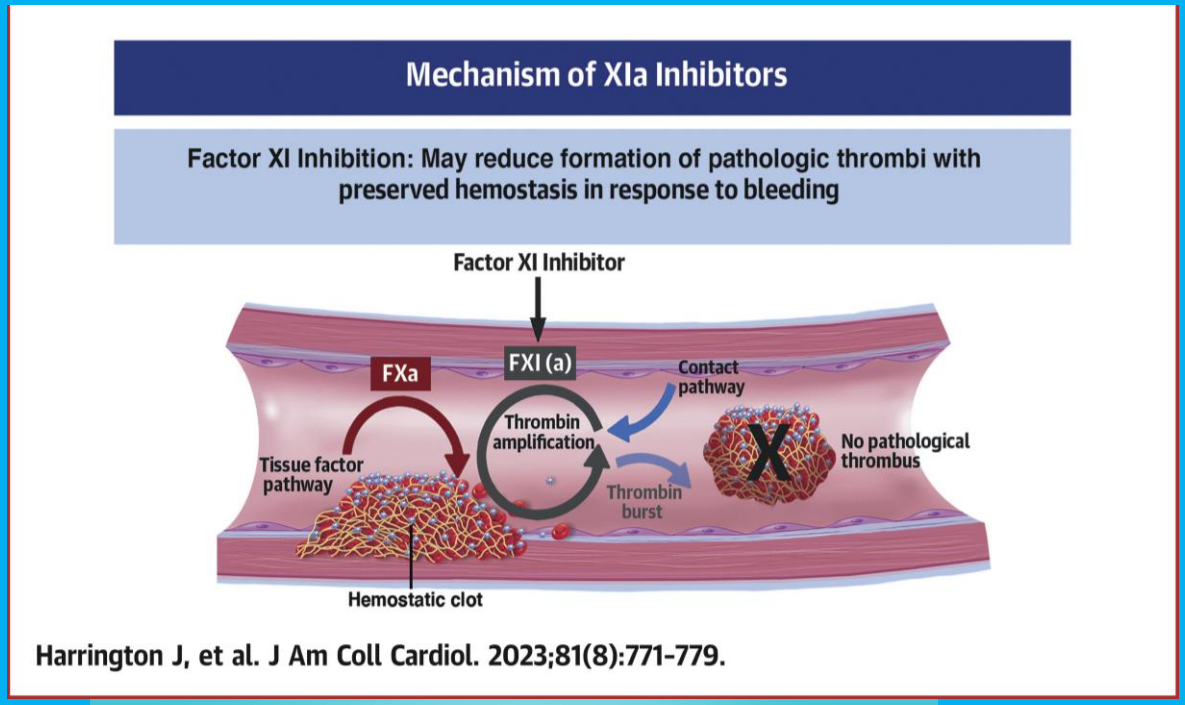
Asundexian Factor XI inhibitor– **OCEANIC Stroke** Trial - NEJM 2026;394:1467-1479

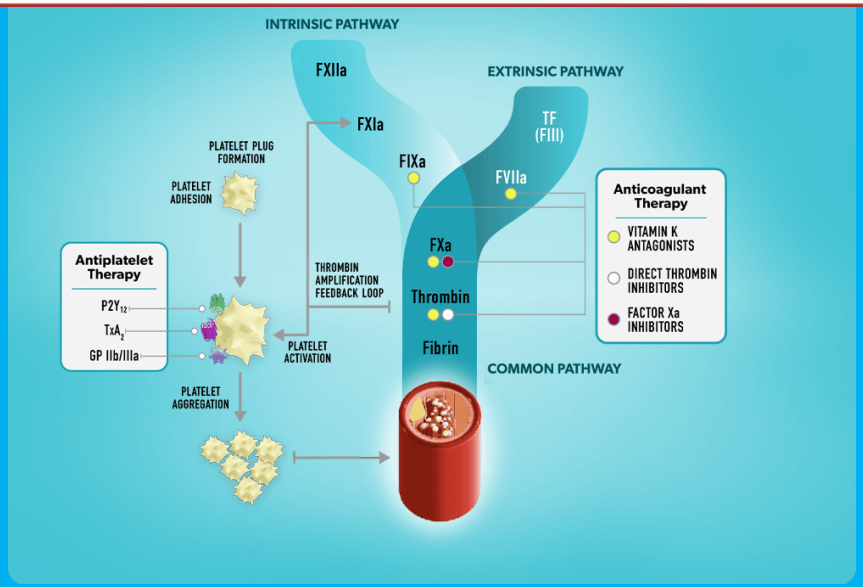
Overview

- **Design:** Global, randomized, double-blind, placebo-controlled Phase 3 study
- **Participants:** 12,327 patients randomized within 72 hours of a noncardioembolic ischemic stroke or high-risk transient ischemic attack (TIA).
- **Treatment:** Asundexian 50 mg once daily vs. placebo, added to single or dual antiplatelet therapy for secondary stroke prevention
- **Follow-up:** Median of approximately 19 months (567 days)

Key Efficacy Results

- **Ischemic Stroke:** Lower incidence in the asundexian group (**6.2%**) compared to placebo (**8.4%**) (Hazard Ratio [HR], 0.74; 95% CI, 0.65–0.84; *P* < 0.001), representing a 26% relative risk reduction.
- **Number Needed to Treat (NNT):** 53 at 1 year and 43 at 2 years.
- **Composite Cardiovascular Events:** Significant reductions in the composite of cardiovascular death, myocardial infarction, or stroke





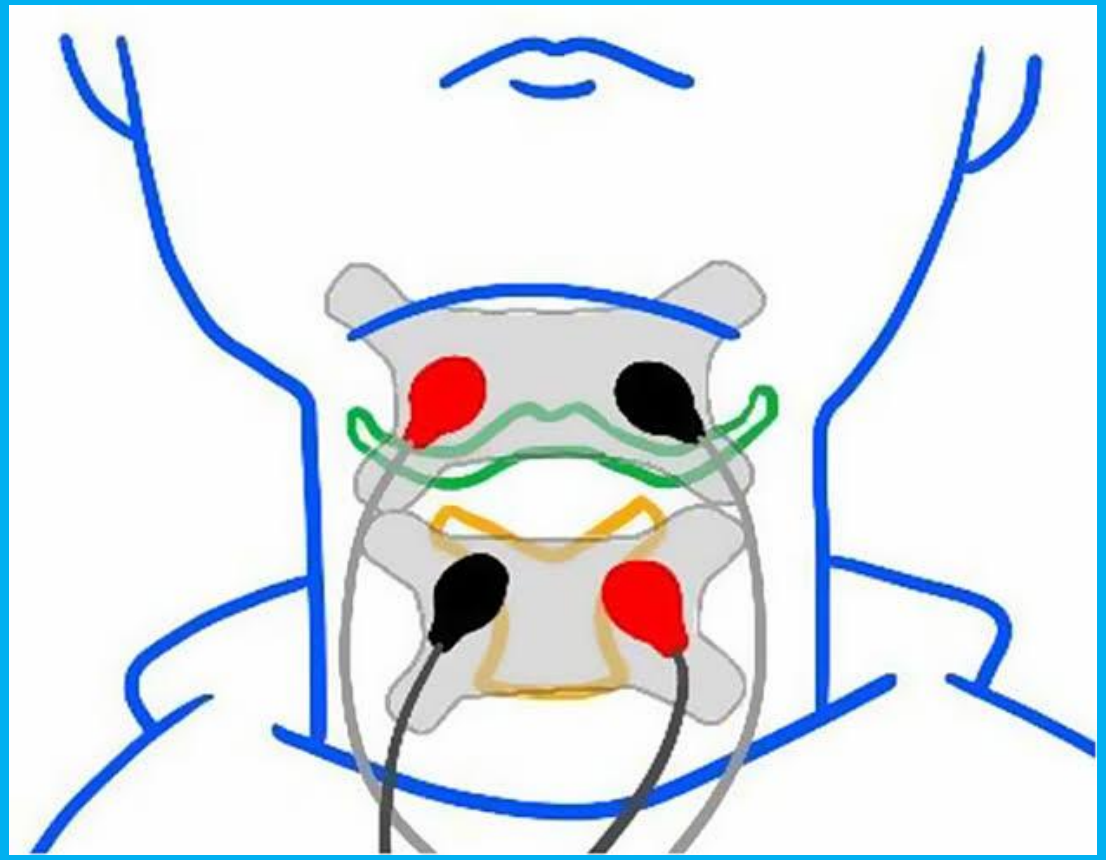
Dysphagia & Rehabilitation Care

COR – 2a with LOE B-R – 2026 Guidelines

In patients with stroke with dysphagia, treatment with pharyngeal electrical stimulation (PES), can be beneficial to reduce dysphagia severity and decrease the risk of aspiration

Takeaways

This therapy represents a shift toward more active treatment of neurogenic dysphagia rather than relying solely on compensatory measures



Effects of oral care combined with neuromuscular electrical stroke stimulation on clinical outcomes in the acute phase of acute ischemic stroke: a pilot randomized controlled trial;
Journal of NeuroEngineering and Rehab; Vol 22 N 122; Phase of acute ischemic 2025

Areas of future potential need for guidance

- Post revascularization blood pressure treatment
- Post revascularization suboptimal reperfusion treatment
  - IA thrombolysis
- Post revascularization treatments
  - Cold saline treatment
- Second IVT treatment