Reperfusion IN Stroke and MI: Similarities AND Differences

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TIME IS BRAIN

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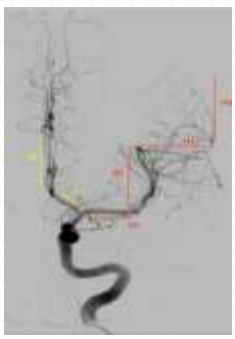
In patients experiencing a typical large vessel acute ischemic stroke

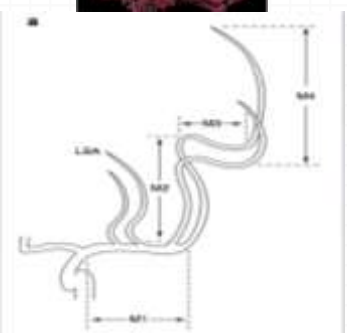
each minute 1.9 million neurone
14 billion synapse
12 Km of myelinated fiber

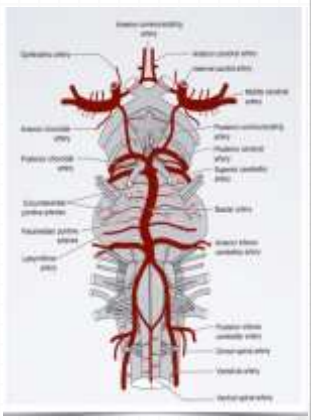
are destroyed!!!

Saver J. stroke. 2006

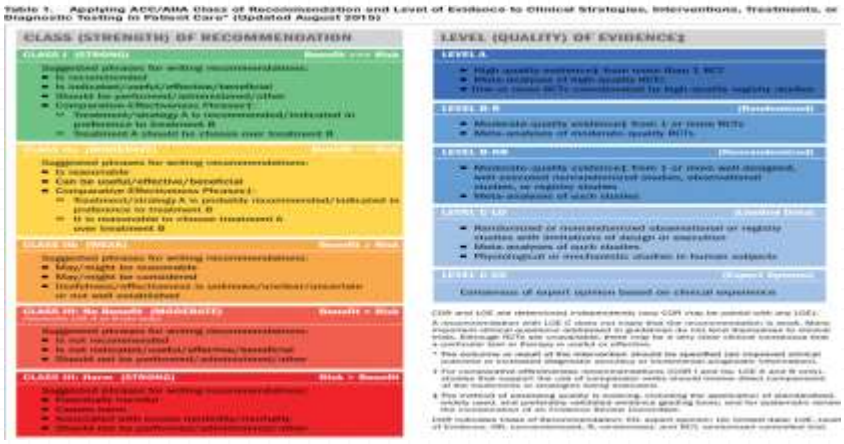
Our cerebral "coronaries"



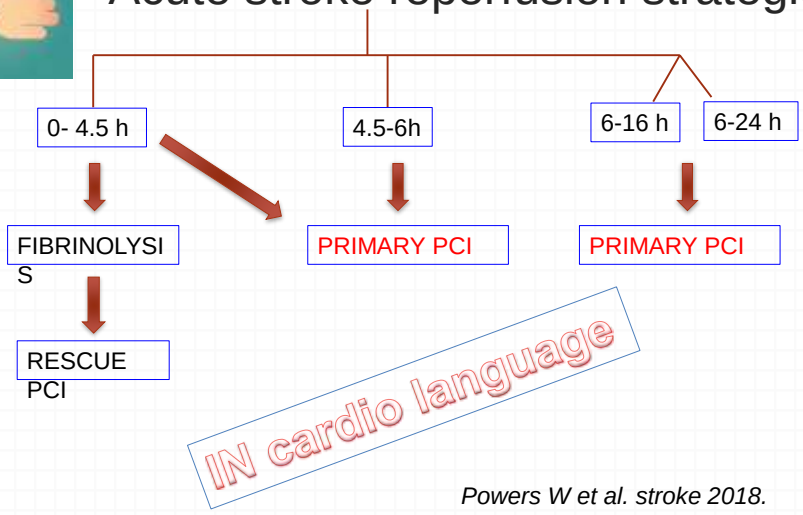




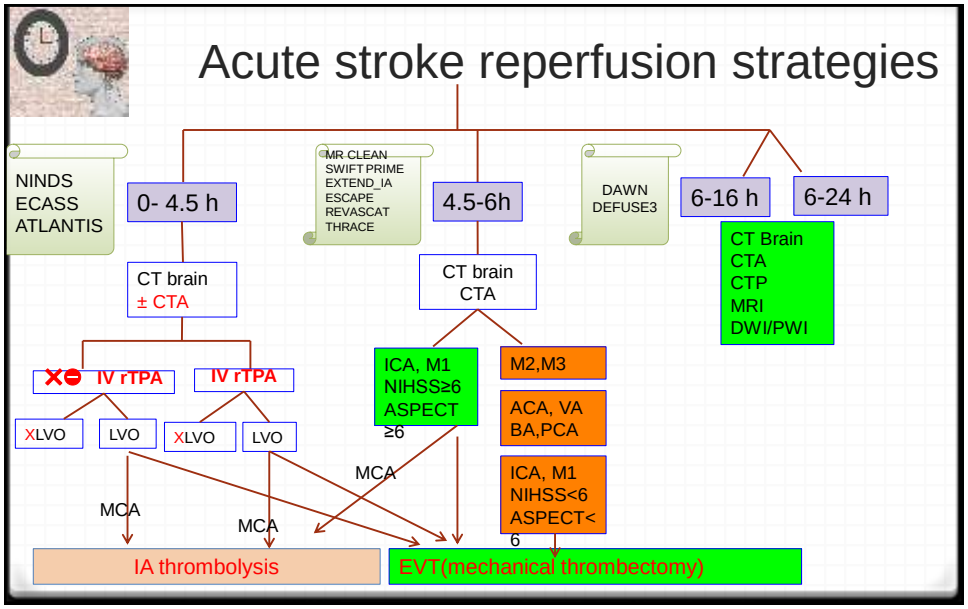
Strength of recommendation & level of evidence in guidelines

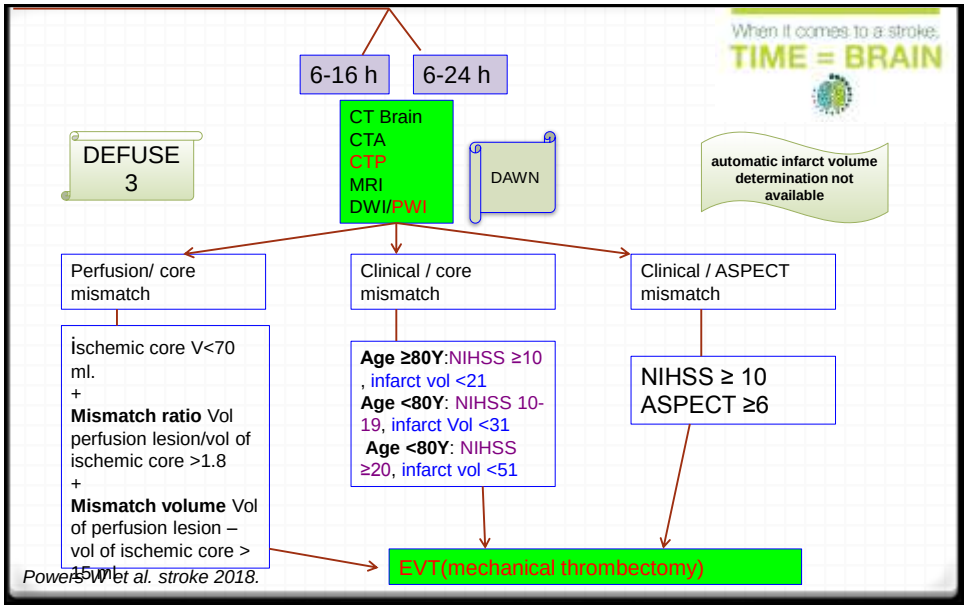


Acute stroke reperfusion strategies



Powers W et al. stroke 2018.





Powers W et al. stroke 2018.

Exclusion criteria for the use of IV rTPA

Absolute exclusion criteria:	
Historical	Previous intracranial hemorrhage Intracranial or GIT neoplasm, AVM, or aneurysm In the previous 3 months: significant stroke or head trauma. intracranial or intraspinal surgery In the previous 7 days: arterial puncture at non compressible site
Clinical	Symptoms suggestive of SAH or infective endocarditis Persistent BP elevation: SBP ≥185 mmhg or DBP ≥110 mmhg. Serum glucose <50 mg/dl. Active internal bleeding. Acute bleeding diathesis.
Hematological	Platelet: <100,000/mm^3 Current anticoagulant use with INR > 1.7 or PT > 15 sec Heparin use within 24 hours or abnormal aPTT > 40 sec Current use of DTI or DFTI (within 48 h)
Radiological	Evidence of hemorrhage. Hypodensity more than 1/3 of the hemisphere ASPECT <6

Exclusion criteria for the use of IV rTPA

Relative exclusion criteria:	
Careful consideration and weighting of risk to benefit. May receive despite of 1 or more relative contraindications.	In the previous 3 months MI In the previous 3 weeks: GIT or Urinary tract bleeding In the previous 2 weeks: major surgery or serious trauma. Seizure at onset. Pregnancy. Rapidly improving or minor symptoms (non disabling)
Extended window relative exclusion	Patients >80 years taking OAC irrespective of INR NIHSS >25 both previous stroke and DM

Similarities

	AMI	AIS
Pathophysiology	Arterial occlusion/ischemic necrosis	Arterial occlusion/ischemic necrosis
Clinical picture	Acute onset	Acute onset
Prognosis	High mortality (if untreated)	High mortality (if untreated)
Effective treatment	Reperfusion therapy	Reperfusion therapy
Thrombolytic treatment	Early reperfusion achieved in <50% of treated patients	Early reperfusion achieved in <50% of treated patients
Catheter-based thrombectomy	Clearly established as the most effective therapy.	Clearly established as the most effective therapy.

Widimsky et al. European Heart journal 2014

Differences	AMI	AIS
Etiology	Uniform: plaque rupture or thrombosis in situ in 90–95% patients, other causes are rare	Multiple: cardioembolic, arterioembolic, thrombosis in situ, lacunar, cryptogenic.
Death of cells after ischemia	begins after 20-40 min (myocyte)	begins after 5 min (neurone)
Arterial occlusive thrombus feasible for catheter-based thrombectomy	Found in 95% of acute coronary angiograms.	Found only in cca 35% of acute CT-angiograms.
Time window symptom onset—intervention start (to offer benefit and not harm)	24 h (48 h in some patients)	6 hours (24 h in some)
Reperfusion damage	Only theoretical, clinically always reperfusion benefit.	Reperfusion damage (bleeding) is a real clinical problem
Clinical picture	Pain alerts the patient to call early for help	Neurologic dysfunction plus absence of pain causes late medical contacts in most pts.
Diagnostic method before reperfusion therapy indication	ECG (fast, simple, cheap, can be done an any facility)	CT (takes more time, expensive, in-hospital)
Laboratory diagnostic marker	Troponin	None yet available
Contraindications for catheter-based thrombectomy	None	intracranial bleeding or advanced ischemia on CT
% of hospitalized patients who undergo reperfusion therapy	>90%	<10%


Thank you