



# Molecular (M), Clinical (C) and Population (P) Bases of Cardiovascular Disease and Health

## MCP BASES OF ATHEROTHROMBOTIC DISEASE, 2019

### Complexities of Acute Stroke and Chronic Carotid Artery Stenosis

### Two Entities with Novel Therapeutic Approaches



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*2. MCP Bases of Atherothrombotic Disease*

*5. Challenges of ACS STEMI & NSTEMI*

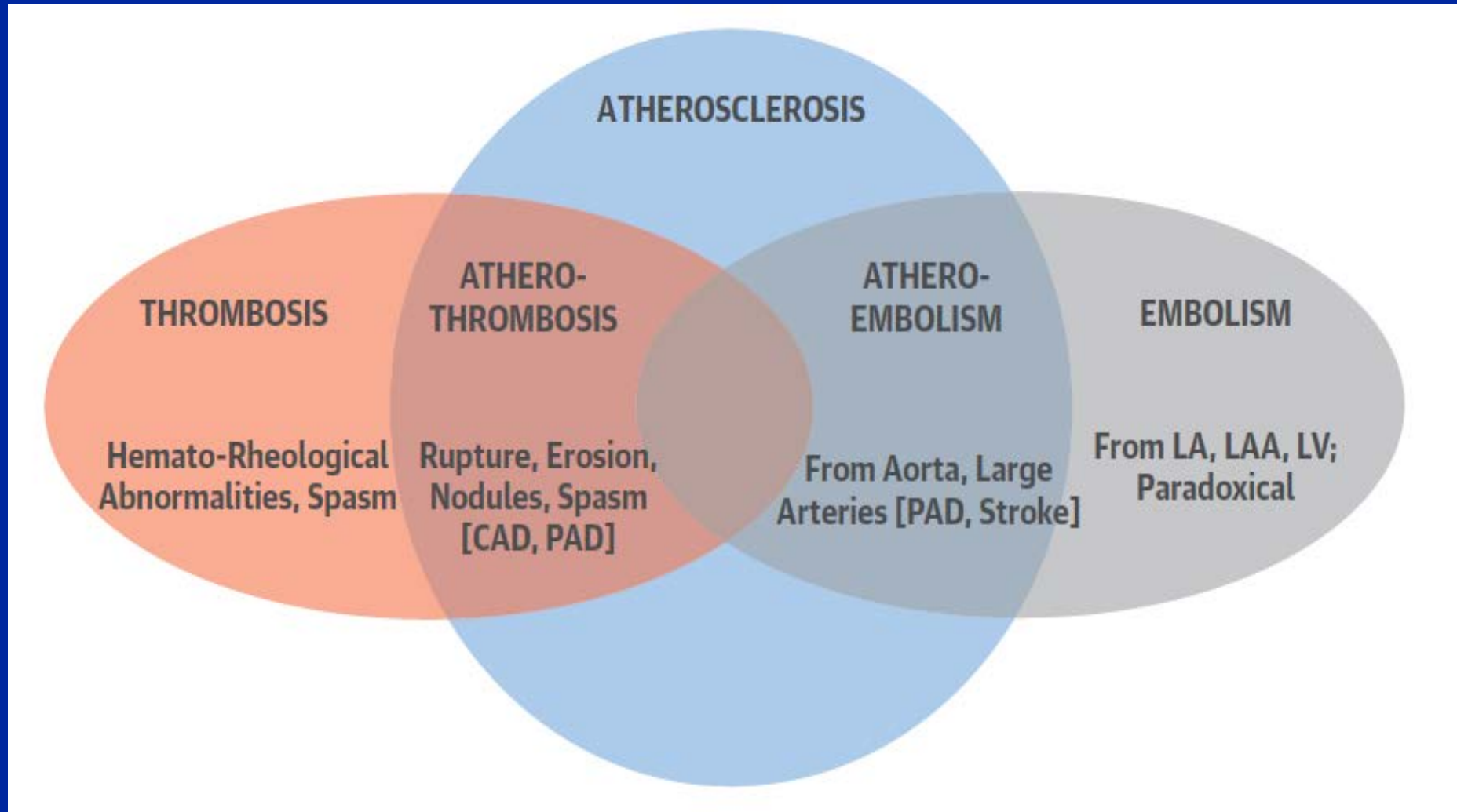
*6. Challenges of Stable CAD & Microcirculation*

*7. Challenges of Acute Stroke & Chronic Carotid Disease*

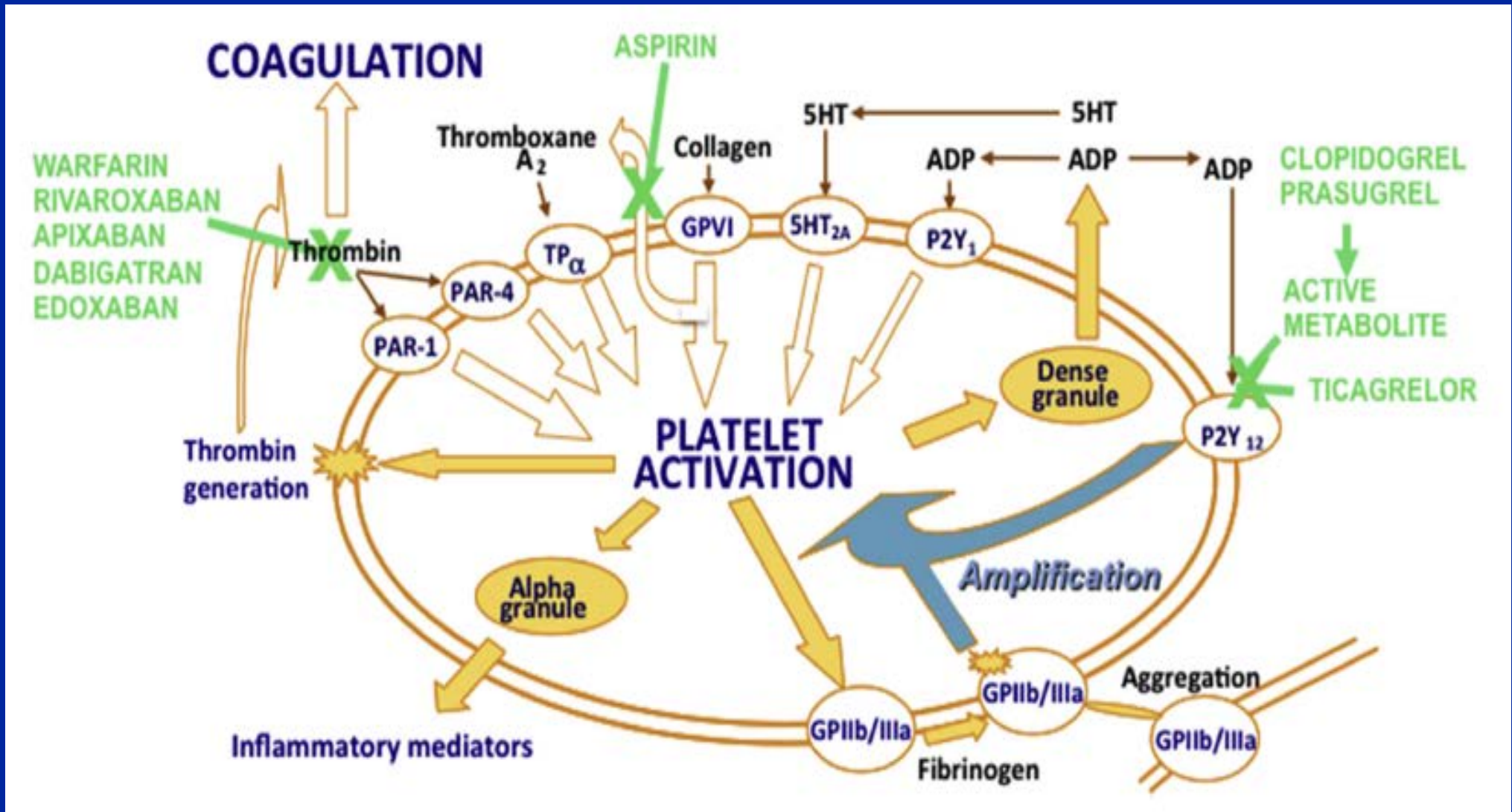
*8. Challenges of Thoracic & Abdominal Aortic Diseases*

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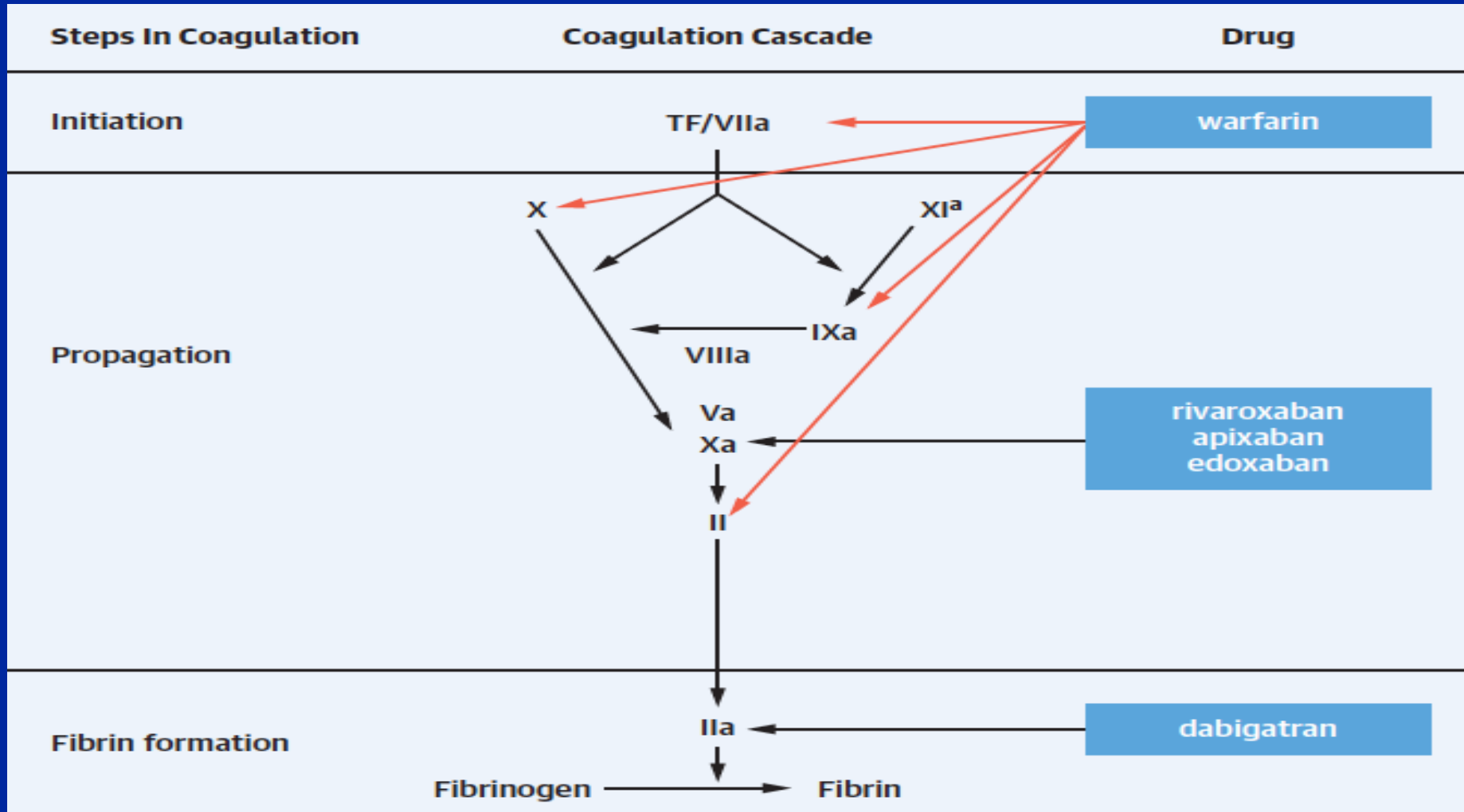
# 1). *Atherothrombotic and Atheroembolic Diseases*



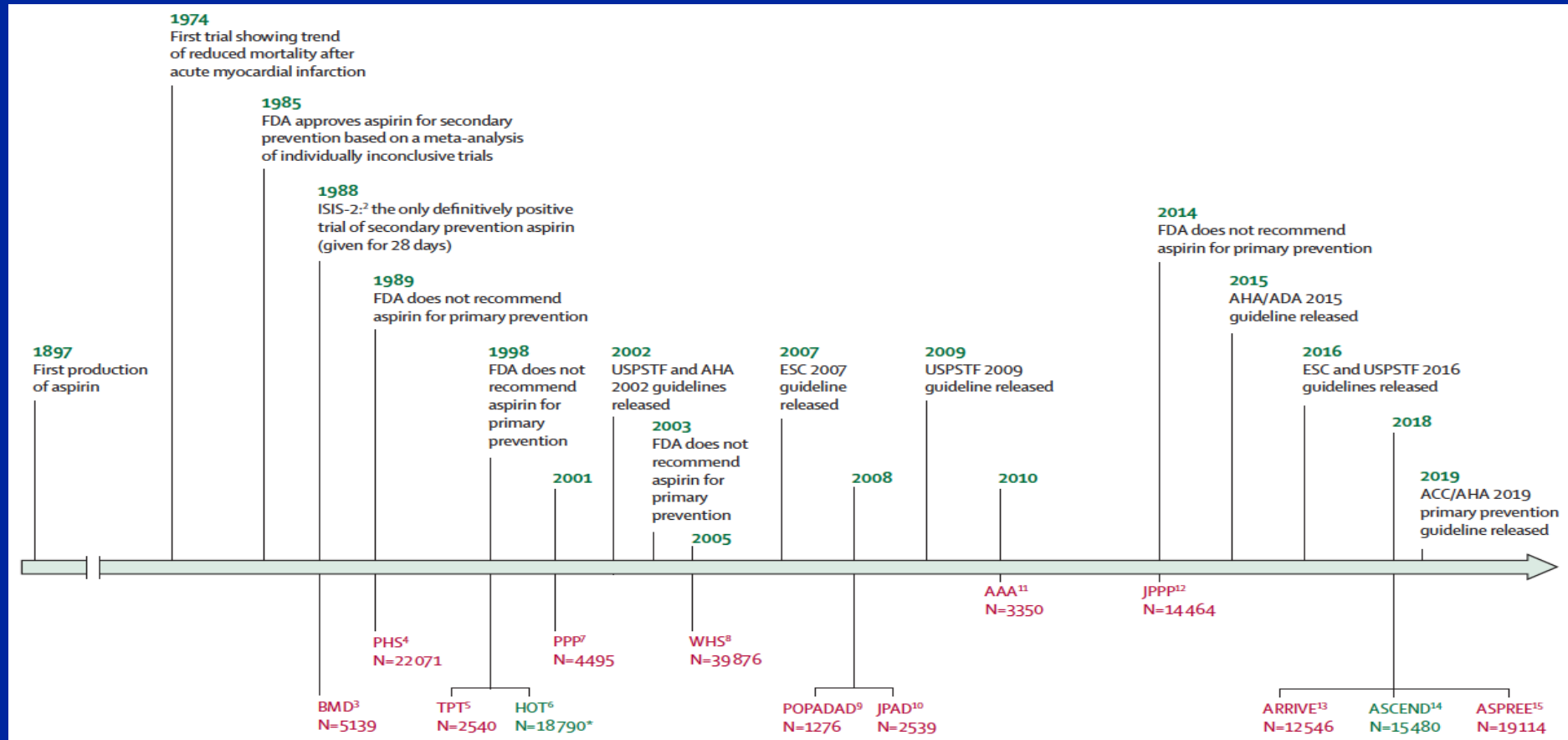
# Thrombin & Platelet Activation



# How?, Coagulation Cascade and Oral Anticoagulation



## 2). History of Aspirin For Use In The Primary Prevention of CVD

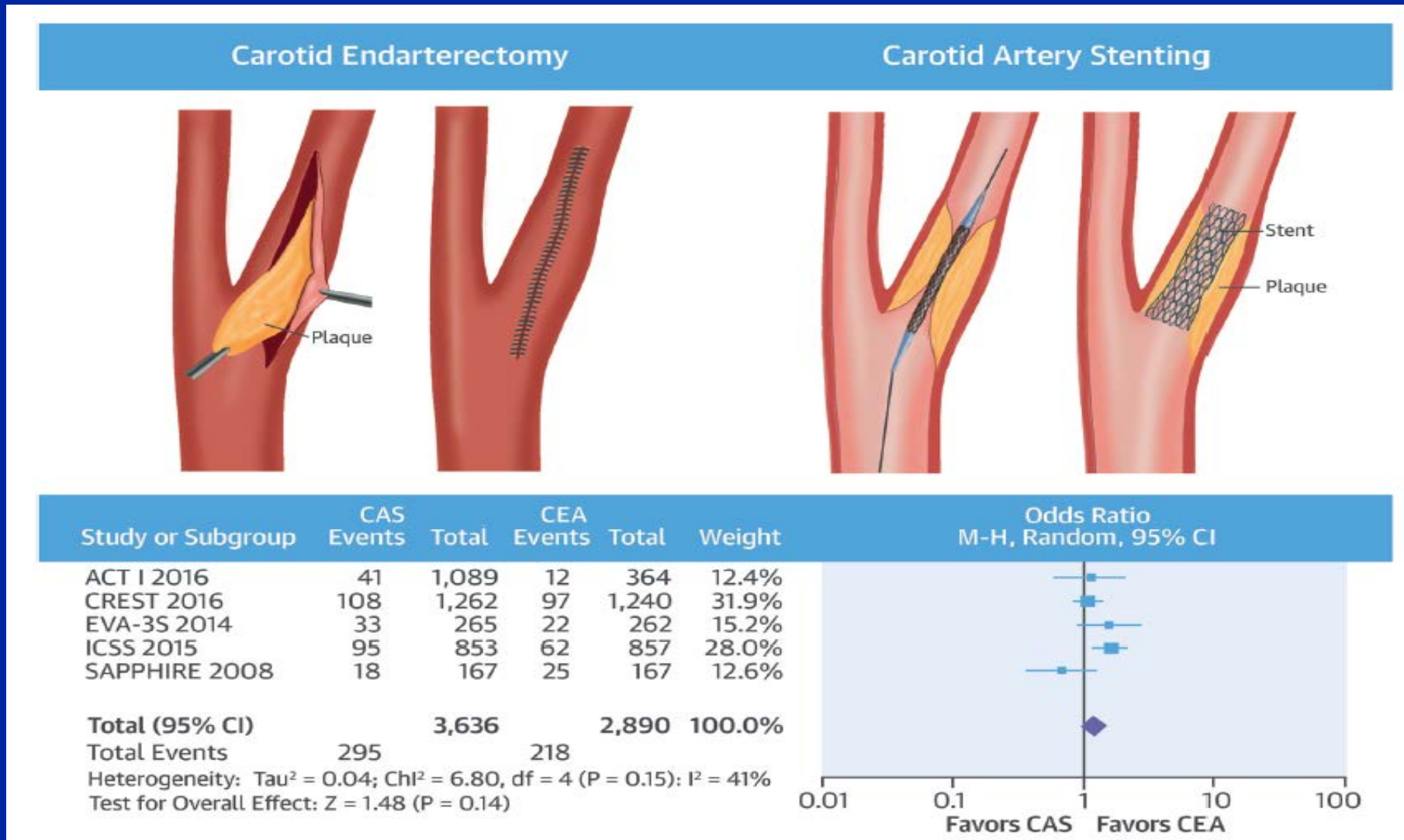


*Green - Significant Reduction In The 1ary. Endpoint.  
Red - Without Reduction In The 1ary Endpoint.*

# Summary Of Major International Guidelines on Aspirin In Primary CV Prevention

	Guideline	Recommendation
2002	USPSTF	Consider use of aspirin in adults at risk for coronary heart disease (5-year risk >3%)
2002	AHA	Consider use of aspirin in adults with >10% 10-year risk of cardiovascular disease
2007	ESC	Consider use of aspirin when the 10-year risk of cardiovascular mortality is increased (SCORE risk >10%) and blood pressure is controlled
2009	USPSTF	Recommend aspirin for men aged 45–79 years, and women aged 55–79 years when cardiovascular benefit outweighs the risk of bleed (grade A)
2015	AHA/ADA	Recommend aspirin for diabetes patients who have a 10-year cardiovascular disease risk of at least 10% but are not at increased risk of bleeding (class IIa); aspirin is reasonable for adults who have diabetes and a 10-year cardiovascular disease risk between 5% and 10% (class IIb)
2016	USPSTF	Recommend aspirin in patients aged 50–59 years with a 10% or greater 10-year cardiovascular disease risk and low risk of bleeding (grade B)
2016	ESC	Recommend against initiating aspirin in individuals without overt cardiovascular disease
2019	AHA/ACC	Recommend against aspirin in individuals older than 70 years and provide a weak recommendation (class IIb) that aspirin might be considered among adults aged 40–70 years

### 3). Stenting vs Endarterectomy for Carotid Artery Stenosis: Aggregated Efficacy/Safety Outcome



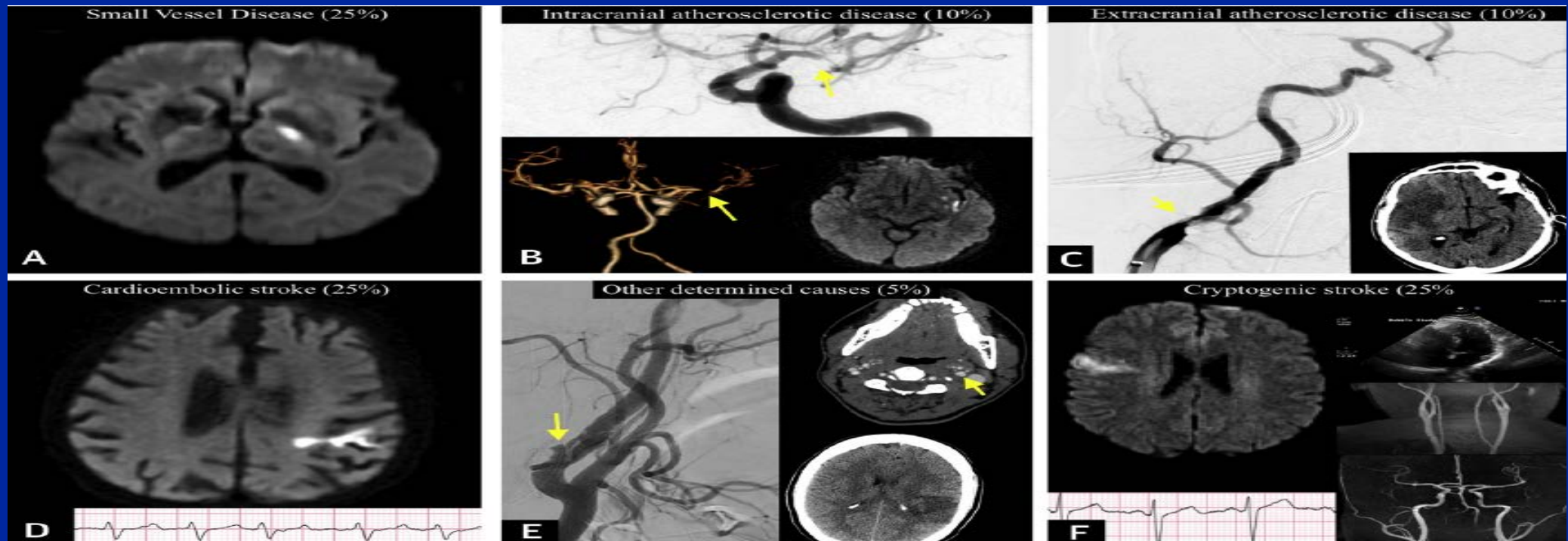


## *Stenting vs Endarterectomy for Carotid Artery Stenosis: Aggregated Efficacy/Safety Outcome*

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*We analyzed 6,526 patients from 5 trials with a mean FU of 5.3 yrs. The composite outcome of periprocedural death, stroke, MI, or nonperiprocedural ipsilateral stroke was **not significantly different between therapies**. The risk of any periprocedural stroke plus nonperiprocedural ipsilateral stroke was higher with CAS and was mostly attributed to **periprocedural minor stroke**. CAS was associated with **significantly lower risk of periprocedural MI**.*

## 4). Prevalence of Stroke Subtypes



**(A) Small vessel disease:** acute right internal capsule lacunar infarct (<20 mm).at **MRI** **(B) Intracranial atherosclerotic disease:** left middle cerebral artery stenosis (>90%) (arrow) associated with acute infarct on left insula at **CT**. **(C) Extracranial atherosclerotic disease:** severe stenosis of ipsilateral cervical internal carotid (arrow) at **Angio.** **(D) Cardioembolic stroke:** left frontal cortical infarct at **MRI** **(E) Other causes of stroke:** dissection of the left cervical internal carotid artery (arrows) associated with ischemic infarct on the left frontal lobe at **Angio & MRI**. **(F) Cryptogenic stroke:** right frontal cortical infarct on **MRI**

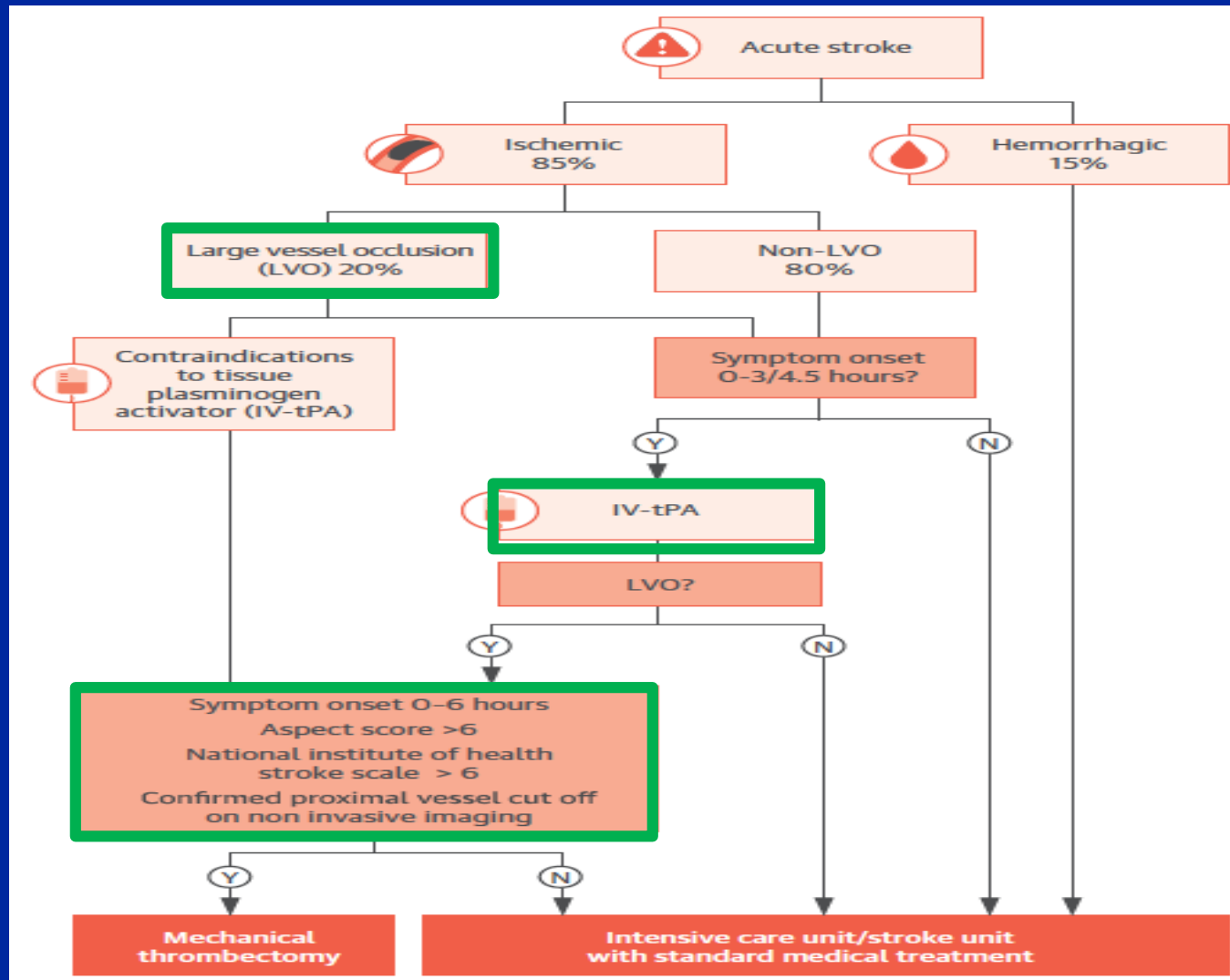
## 5). Endovascular Thrombectomy of L. Vessel Ischaemic Stroke: Individual Patient Data From 5 Randomised Trials

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**In 2015, five randomised trials showed efficacy of endovascular thrombectomy over standard medical care in patients with acute ischaemic stroke caused by occlusion of arteries of the proximal anterior circulation. We formed the HERMES collaboration to pool patient-level data from the five trials (MR CLEAN, ESCAPE, REVASCAT, SWIFT PRIME, and EXTEND IA) done between December, 2010, and December, 2014. In these trials, patients with acute ischaemic stroke caused by occlusion of the proximal anterior artery circulation were randomly assigned to receive either endovascular thrombectomy within 12 h of symptom onset or standard care (control), with a primary outcome of reduced disability on the modified Rankin Scale (mRS) at 90 days. The beneficial findings will have implications on structuring systems.**

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# New Standard-of-Care in Acute Ischemic Stroke: Mechanical Thrombectomy With IV-rtPA for LVO



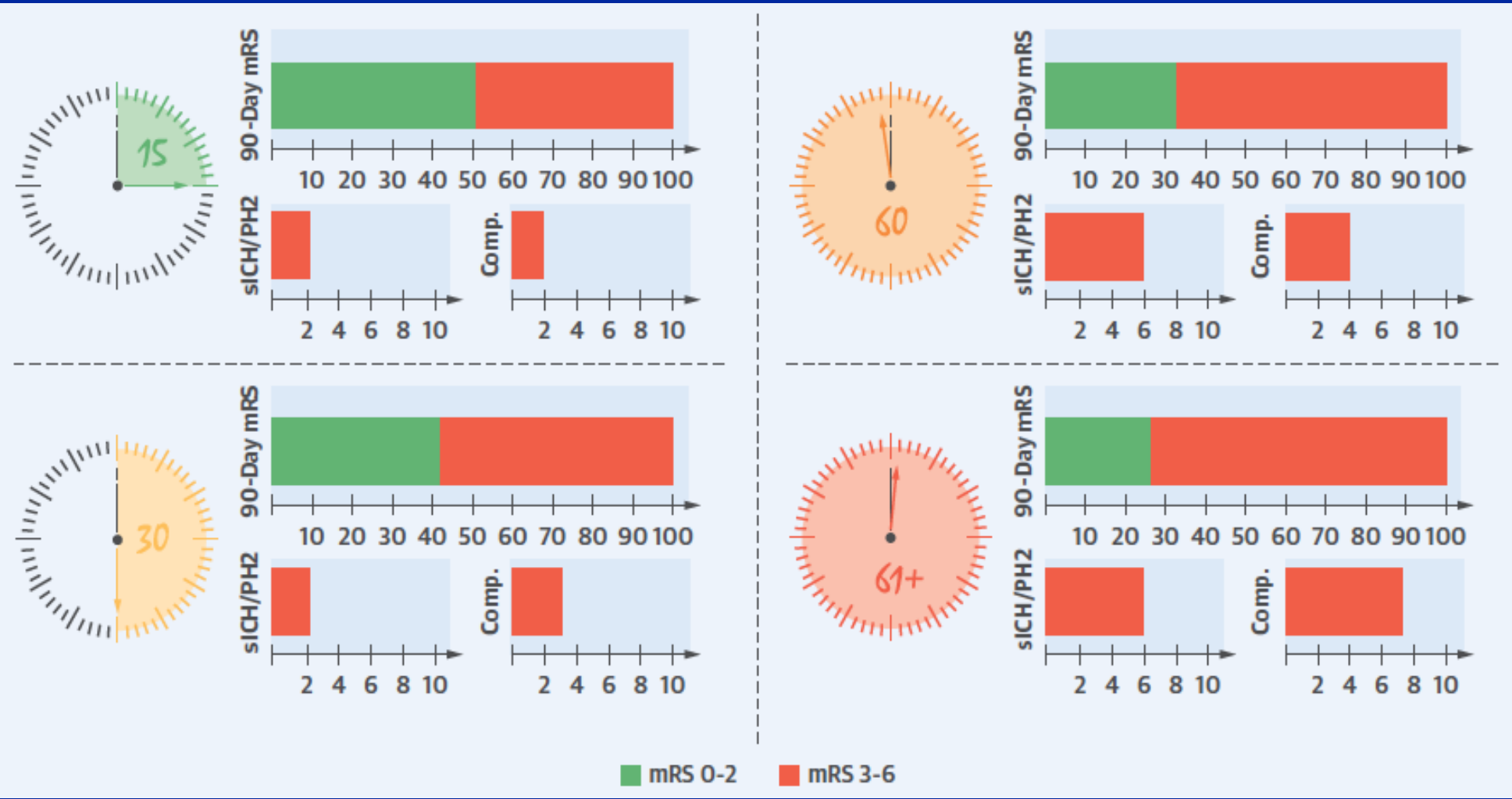
## *Procedure Time-Dependent Increase in Rates of Poor Outcome, Complications, and Hemorrhage After ET*

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*Relationship between procedure time and outcomes after endovascular thrombectomy (ET) was studied in 1,357 patients from 7 centers. Good outcomes were defined as modified Rankin score (mRS) 0 to 2 at 90 days; rates of intraprocedural complications (Comp.) and post-procedural parenchymal hemorrhage type 2 (PH2) and symptomatic intracranial hemorrhage (sICH) were evaluated. Increasing procedure time was associated with lower likelihood of good outcome and higher rates of intraprocedural complications and post-procedural hemorrhage. Procedure time ranges in shaded regions are defined as 15 (0-15 min), 30 (>15–30 min), 60 (>30–60 min) and 61+ ( $\geq 61$  min).*

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# Procedure Time-Dependent Increase in Rates of Poor Outcome, Complications, and Hemorrhage After ET



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## Antithrombotic Therapy to Prevent Recurrent Strokes Among Patients With Ischemic Cerebrovascular Disease

*Stroke survivors carry a **high risk of recurrence**. Appropriate **antithrombotic agent selection** should be based on the best understanding of the **physiopathological mechanism** that led to the initial ischemic injury. **Antiplatelet therapy** is preferred for **atherosclerosis** and endothelial injury, whereas **anticoagulant agents** are favored for **cardiogenic embolism** and **highly thrombophilic conditions**. **Large randomized controlled trials** have provided new data to support **recommendations**.*

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