

# TAXINOMISIS – a multidisciplinary project on stratification of patients with carotid artery disease

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KLINIKA ZA VASKULARNU  
I ENDOVASKULARNU  
HIRURGIJU



## Problem/Level no 1. GENERAL PRACTITIONER LEVEL

☐ Asymptomatic patients with or without other risk factors are visiting general practitioners

Recommendation 15	Class	Level	References
Routine population screening for asymptomatic carotid stenosis is not recommended	III	C	64
Recommendation 16			
Selective screening for asymptomatic carotid stenoses may be considered in patients with multiple vascular risk factors to optimise risk factor control and medical therapy to reduce late cardiovascular morbidity and mortality, rather than for identifying candidates for invasive carotid interventions	IIb	C	72,73

☐ Can we help to General Practitioner to select patient who will benefit from carotid duplex?  
☐ Once diagnosed how frequent carotid stenosis should be followed? Can we predict progression?

## 2.10. Unresolved issues relating to managing carotid artery disease

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The Writing Group identified key issues relating to the investigation and management of carotid artery disease that need to be addressed to better inform future guidelines. These include:

*Should the "accepted" risk thresholds for performing CEA or CAS be reduced from 6% in symptomatic patients and 3% in asymptomatic patients?*

*Should the time threshold for a patient being defined as "recently symptomatic" (currently 6 months) be reduced?*

*The need to develop a validated algorithm for identifying "high-risk for stroke" asymptomatic patients in whom to target CEA and CAS.*

*To determine whether asymptomatic carotid disease contributes towards cognitive decline and whether CEA/CAS can reverse or prevent this?*

*Whether measurement of plasma biomarkers to evaluate excessive endothelial and coagulation system activation has any potential for guiding risk stratification in patients with asymptomatic carotid disease.*

*Should all recently symptomatic patients be started on dual antiplatelet therapy once parenchymal haemorrhage is excluded on CT/MRI and then be continued through the perioperative period?*

*Relevance of new DW-MRI lesions after CEA and CAS. Do these contribute towards a higher rate of recurrent stroke or cognitive decline?*

*In patients undergoing emergency stent retrieval thrombectomy for acute ischaemic stroke because of*

Eur J Vasc Endovasc Surg (2018) 55, 3–81

Editor's Choice — Management of Atherosclerotic Carotid and Vertebral Artery Disease: 2017 Clinical Practice Guidelines of the European Society for Vascular Surgery (ESVS)

*Whether measurement of plasma biomarkers to evaluate excessive endothelial and coagulation system activation has any potential for guiding risk stratification in patients with asymptomatic carotid disease.*

## Problem/Level no 2. SPECIALIST LEVEL

❑ Once duplex exam is positive on carotid stenosis greater than 50%, who should get CTA or MRA?

Recommendation 1	Class	Level	References
Duplex ultrasound (as first-line), computed tomographic angiography and/or magnetic resonance angiography are recommended for evaluating the extent and severity of extracranial carotid stenoses	I	A	18
Recommendation 2			
When carotid endarterectomy is being considered, it is recommended that Duplex ultrasound stenosis estimation be corroborated by computed tomographic angiography or magnetic resonance angiography, or by a repeat Duplex ultrasound performed by a second operator	I	A	18
Recommendation 3			
When carotid stenting is being considered, it is recommended that any Duplex ultrasound study be followed by computed tomographic angiography or magnetic resonance angiography which will provide additional information on the aortic arch, as well as the extra- and intracranial circulation	I	A	18

❑ Can we (TAXINOMISIS) help to specialist (MDTs) to select patient who will benefit from CTA and MRA once carotid stenosis has been seen on Duplex?



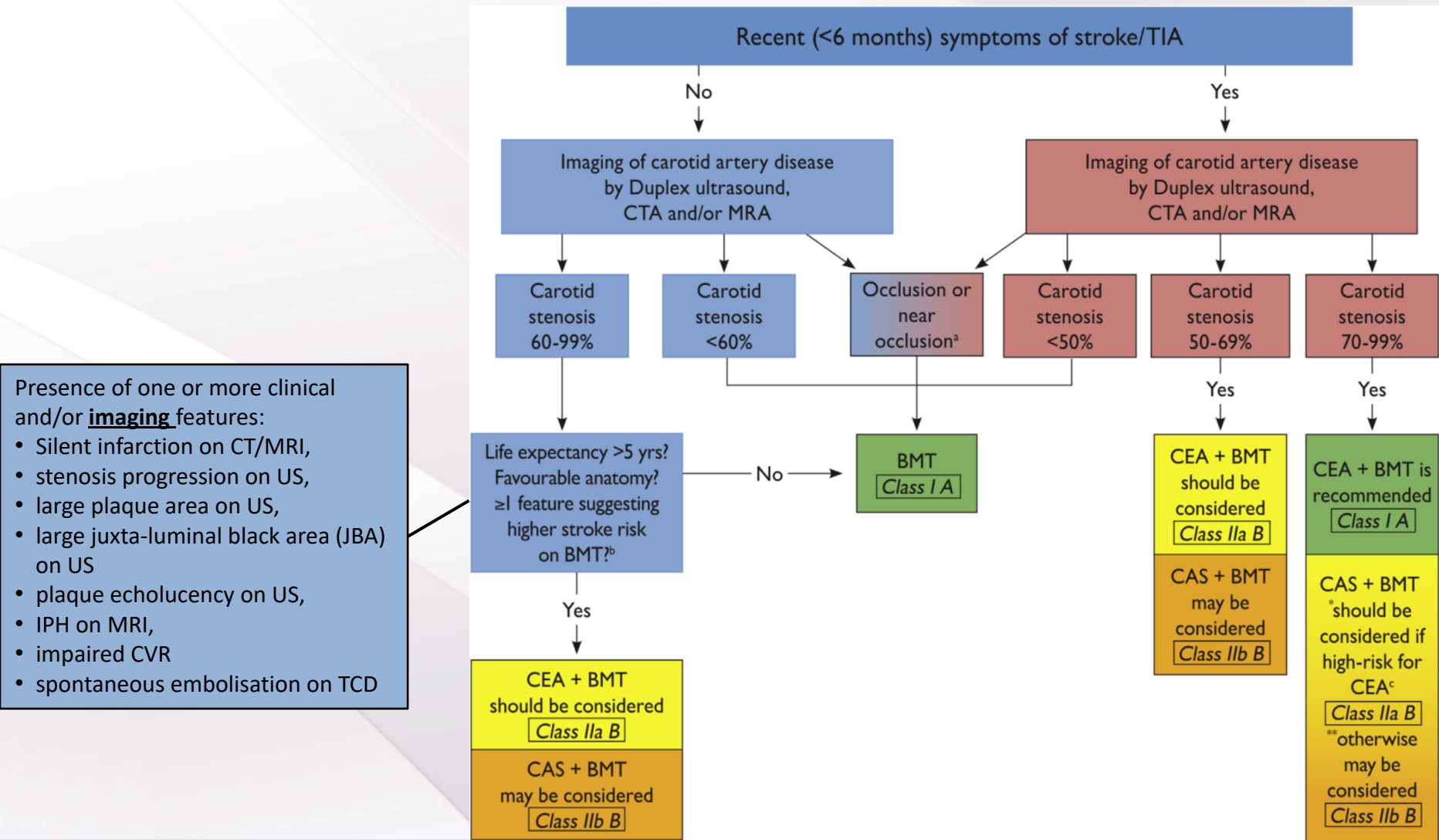
## Problem/Level no 3. MDTs LEVEL

❑ MDTs should decide if asymptomatic patients with carotid stenosis should benefit from intervention

Recommendation 17	Class	Level	References
In "average surgical risk" patients with an asymptomatic 60–99% stenosis, carotid endarterectomy should be considered in the presence of one or more imaging characteristics that may be associated with an increased risk of late ipsilateral stroke, <sup>a</sup> provided documented perioperative stroke/death rates are <3% and the patient's life expectancy exceeds 5 years	Ila	B	13,35,54,84–94, 96,97
Recommendation 18			
In "average surgical risk" patients with an asymptomatic 60–99% stenosis in the presence of one or more imaging characteristics that may be associated with an increased risk of late ipsilateral stroke, <sup>a</sup> carotid stenting may be an alternative to carotid endarterectomy, provided documented perioperative stroke/death rates are <3% and the patient's life expectancy exceeds 5 years	Iib	B	80,84–98
Recommendation 19			
Carotid stenting may be considered in selected asymptomatic patients who have been deemed by the multidisciplinary team to be "high-risk for surgery" and who have an asymptomatic 60–99% stenosis in the presence of one or more imaging characteristics that may be associated with an increased risk of late ipsilateral stroke, <sup>a</sup> provided documented procedural risks are <3% and the patient's life expectancy exceeds 5 years	Iib	B	84–94,104,105

❑ Can we (TAXINOMISIS) help to MDTs to select patient who are at higher risk of cerebral event and might benefit from carotid intervention?

# Standard of Care (Guidelines)



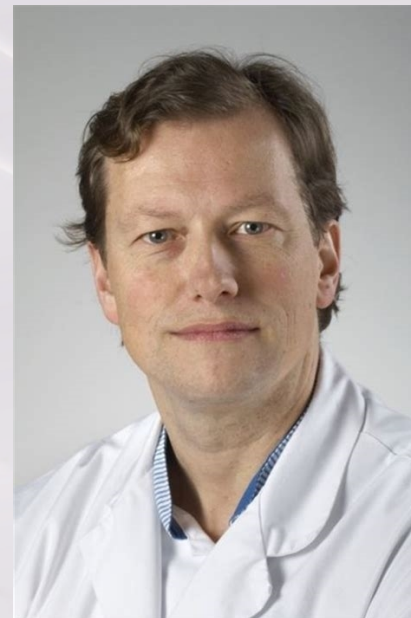
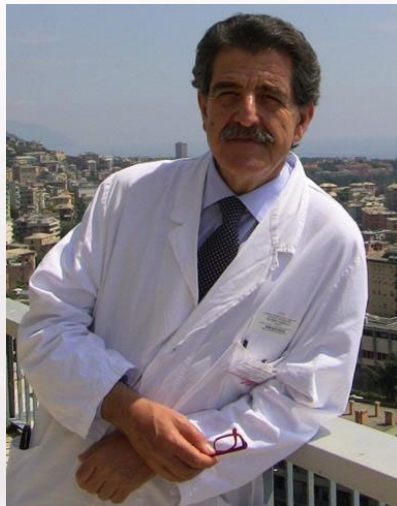


# TAXINOMISIS





# VASCULAR PARTNERS





## Pert chart

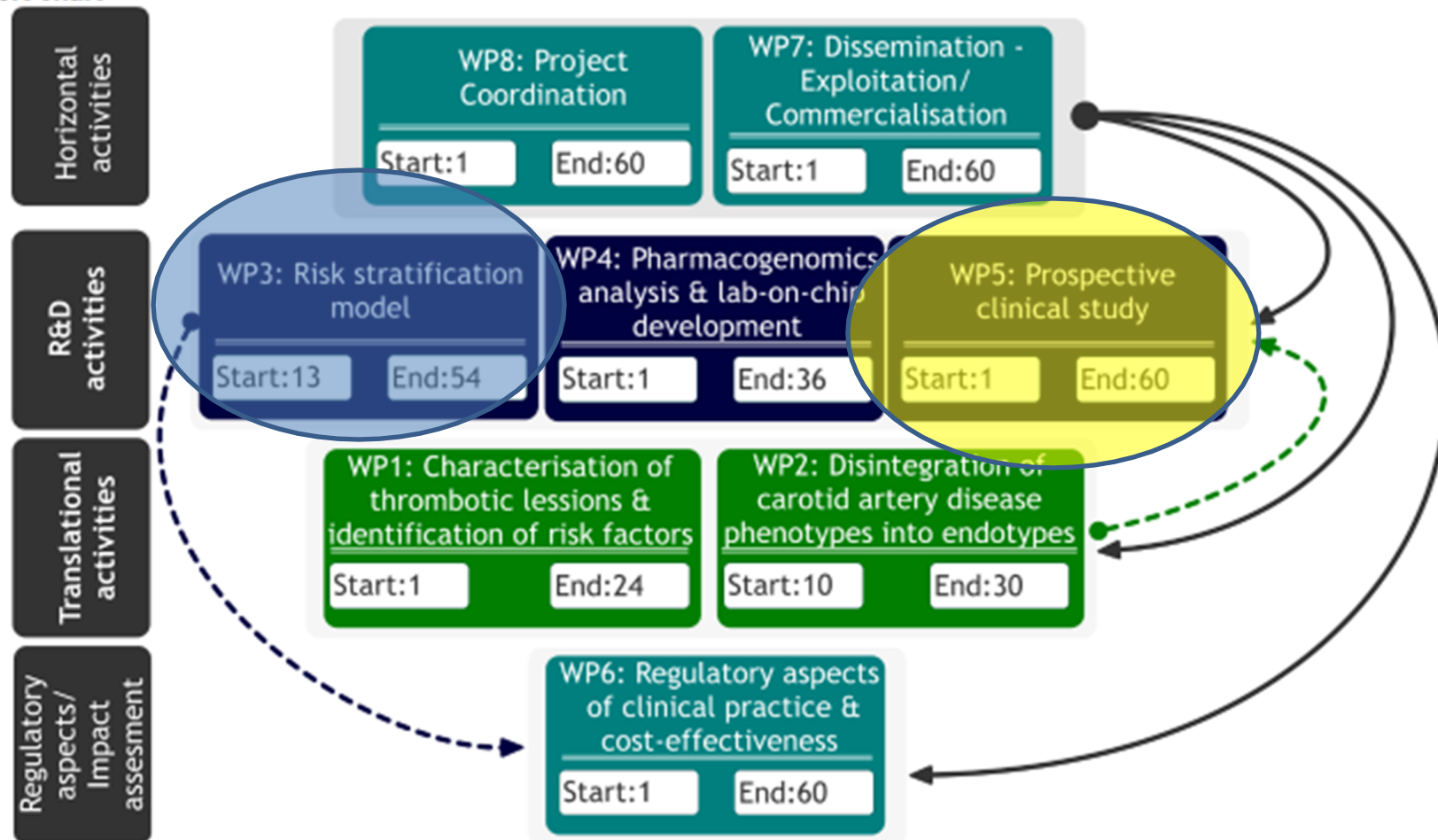


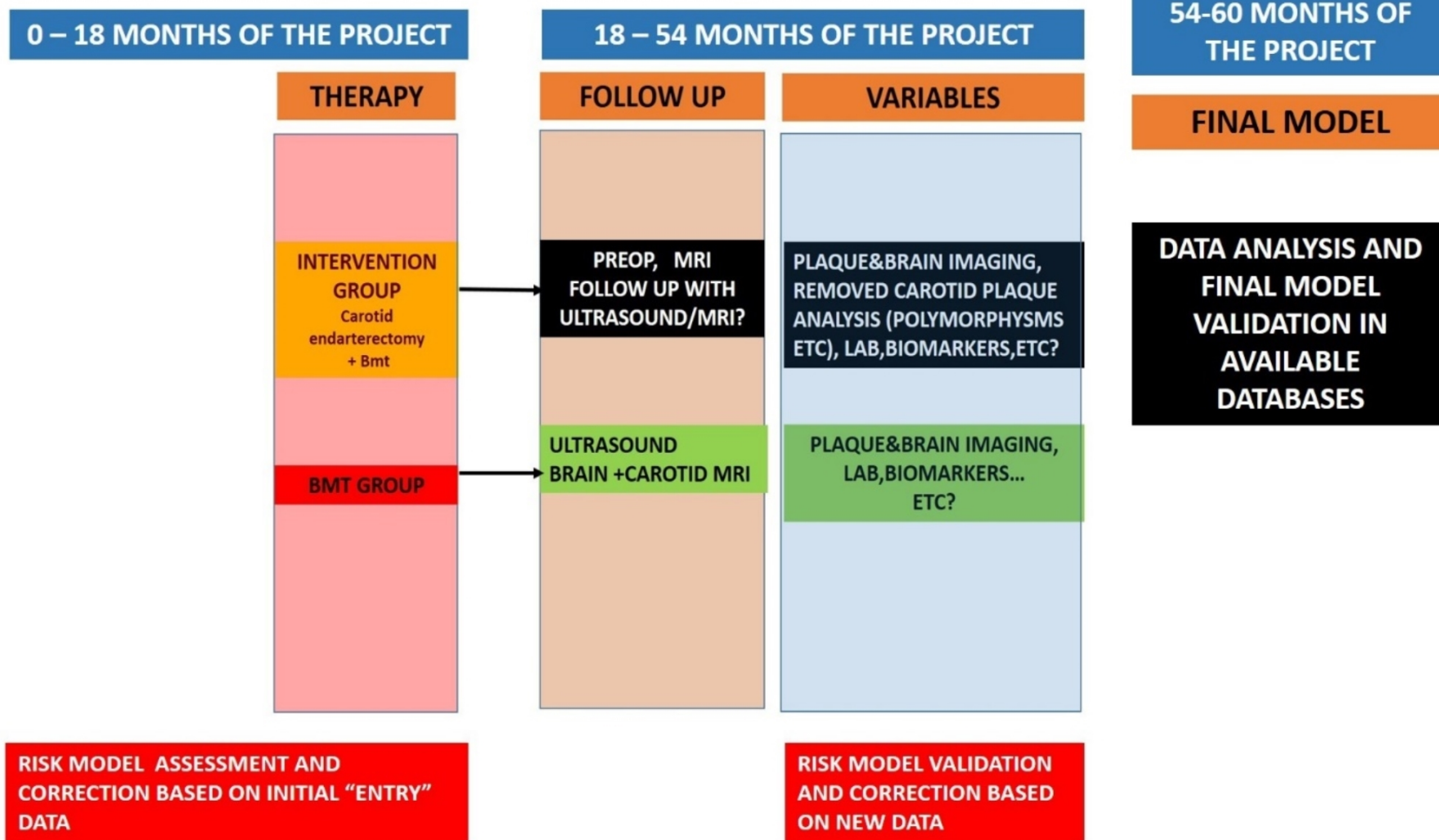
Figure 23: TAXINOMISIS Pert Chart.



# **A multidisciplinary approach for the stratification of patients with carotid artery disease WP5 Clinical study**

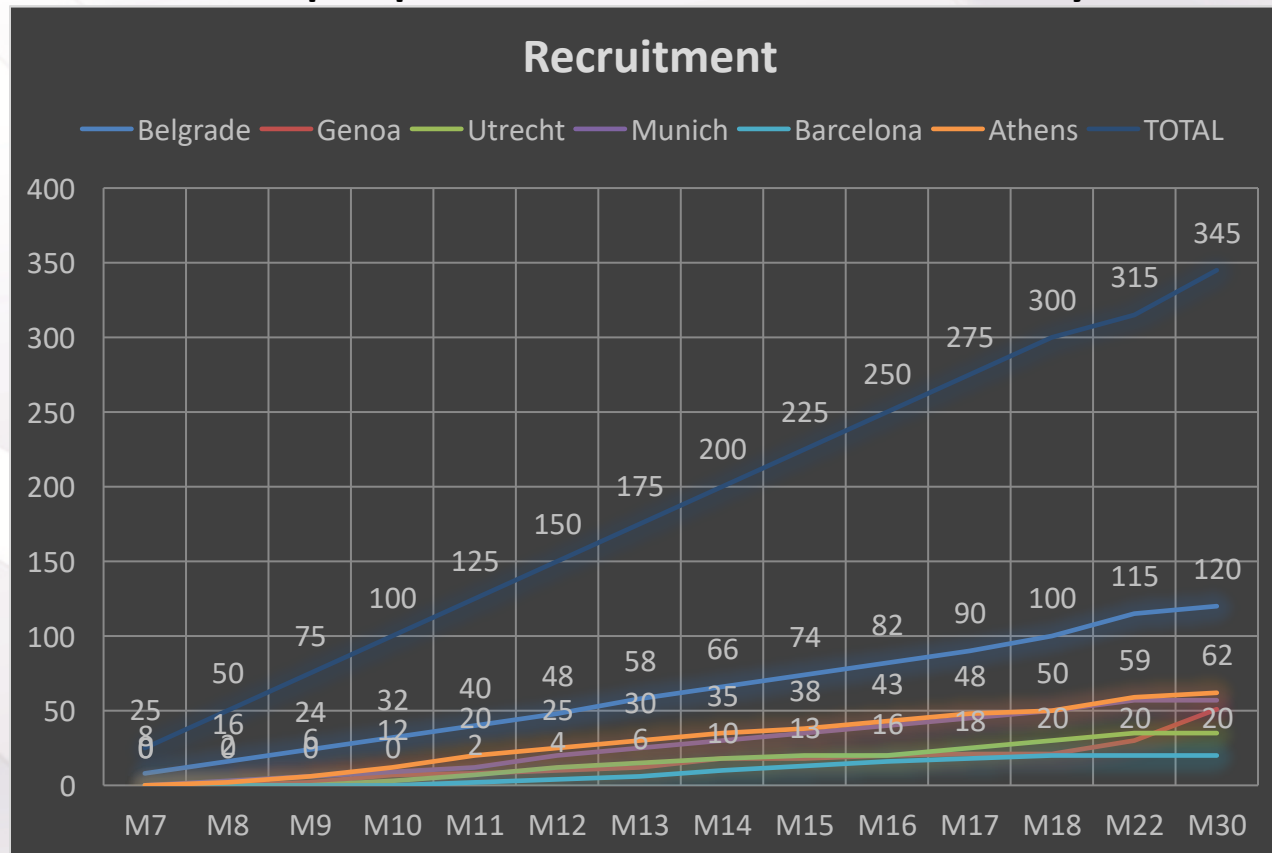


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## WP5

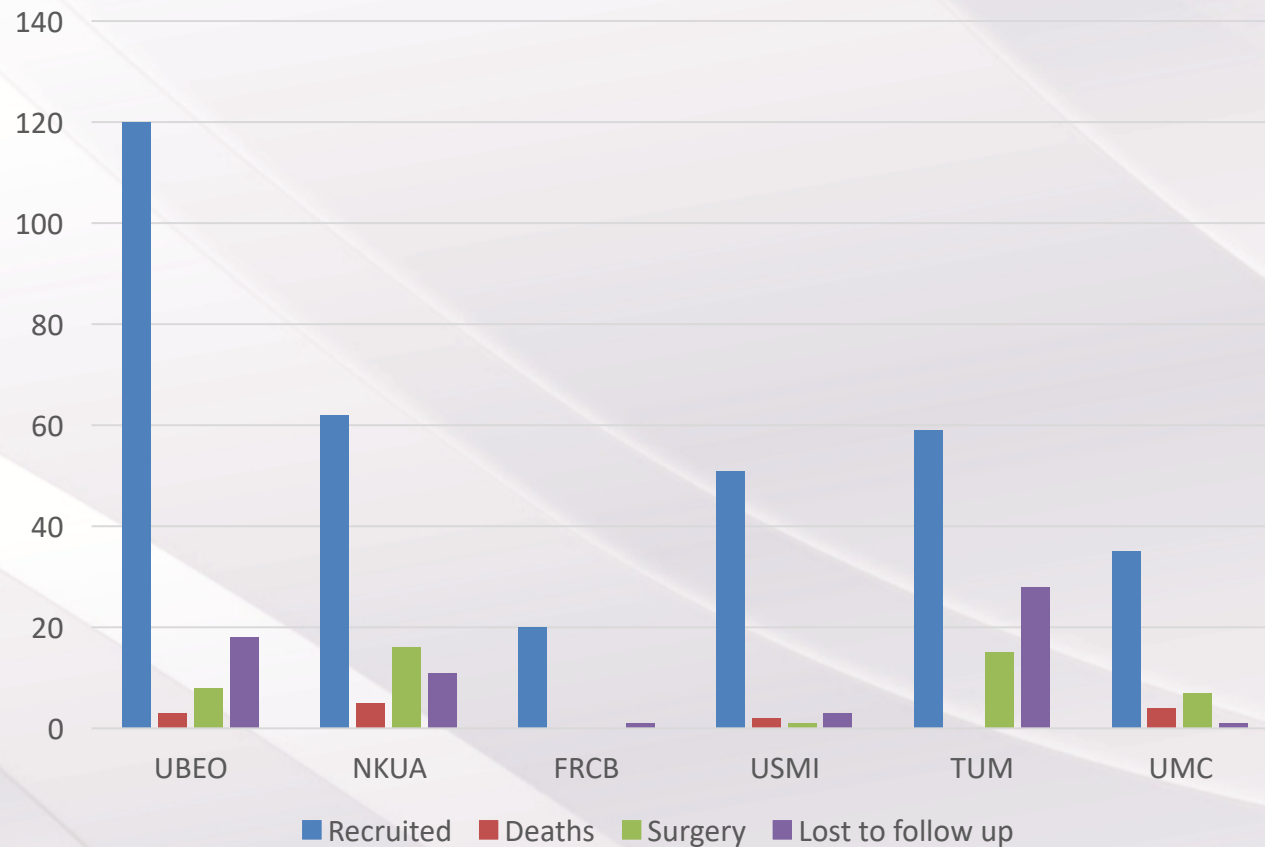
### From research to the clinic: Evaluation of the new risk stratification tool in a prospective observational clinical study



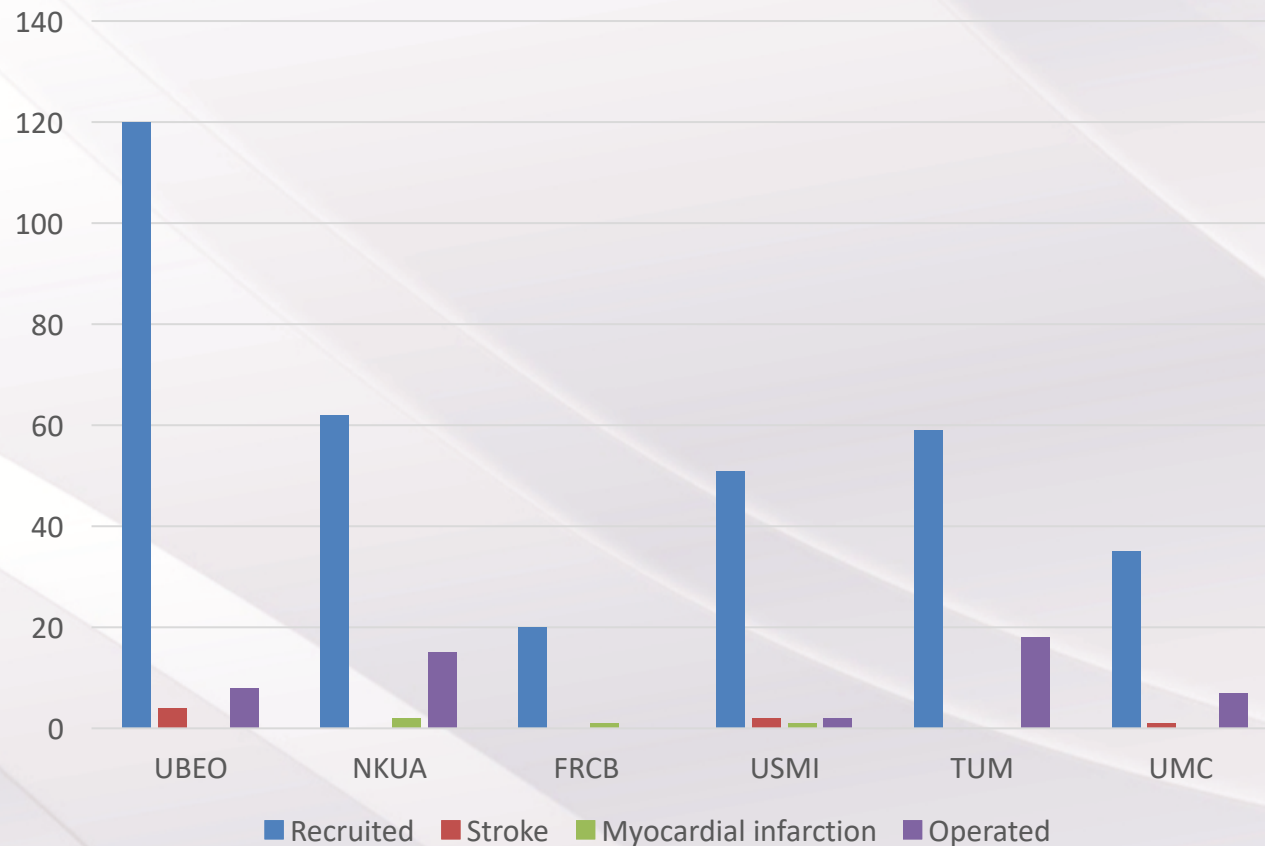
Collaborating center	Recruited finally
Belgrade	120
Athens	62
Barcelona	20
Genoa	51
Munich	57
Utrecht	35
<b>Total</b>	<b>345</b>



# Updated follow up status



# Updated follow up status



# MRI protocol

- ❑ Difficult coordination of MRI protocols and image quality

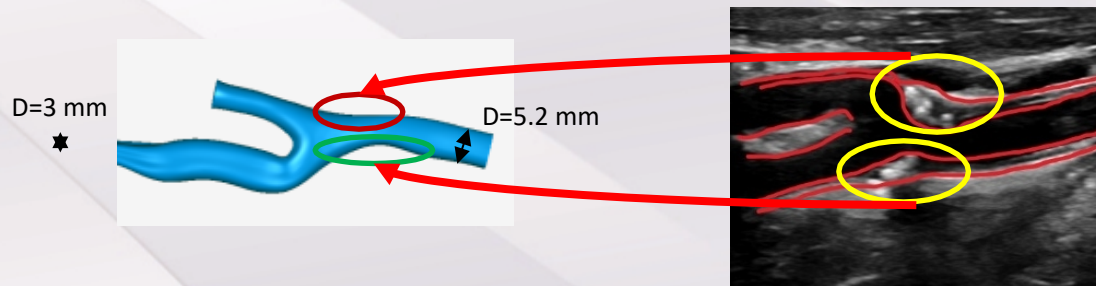
# MRI data quality

- ❑ MRI image quality is acceptable but still problems are
- ❑ Movements, region of interest failed, lack of FS
- ❑ Protocol improved by adding T1W BB with FS before applying the contrast and T1W BB with FS after applying the contrast media
- ❑ USMI failed to brain images

# Duplex data quality

## ❑ Duplex ultrasound protocol

We had to improve protocol for image collection





# MRI ANNOTATION PROGRESS

- MRI is complex technology and interpretation. Two independent MRI radiologists (UBEO and NKUA) reached good interobserver variability for plaque characteristics
- Detailed annotations of all plaques on the way

# SUBSTUDY

- Correlation between basic duplex data on carotid artery and brain lesion on brain MRI (localisation, number, type and volume)

- Risk stratification tool
- Modeling of carotid bifurcation and plaque based on ultrasound images
- MRI carotid plaque analysis
- Brain MRI analysis