Time to carotid interventions the stroke is coming…

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30/11/2018

- Why 2 weeks?
- Is it 2 days, 1 week or 2 weeks?
- What about CAS in the hyperacute/acute period?
- What do contemporary guidelines say?
- Are we performing CEAs within 2 weeks?

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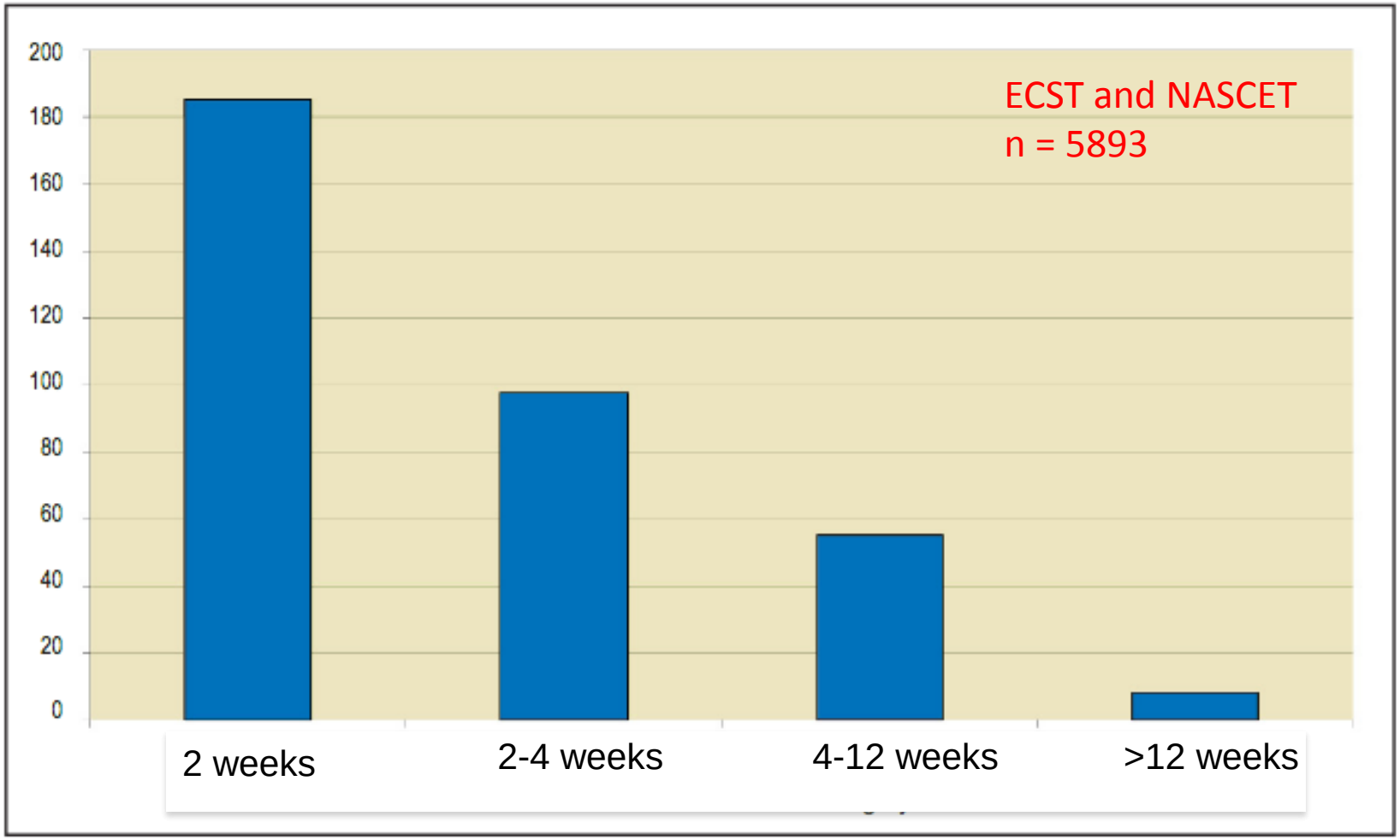
Why 2 weeks?

NICE National Institute for Health and Care Excellence

American Heart Association | American Stroke Association®

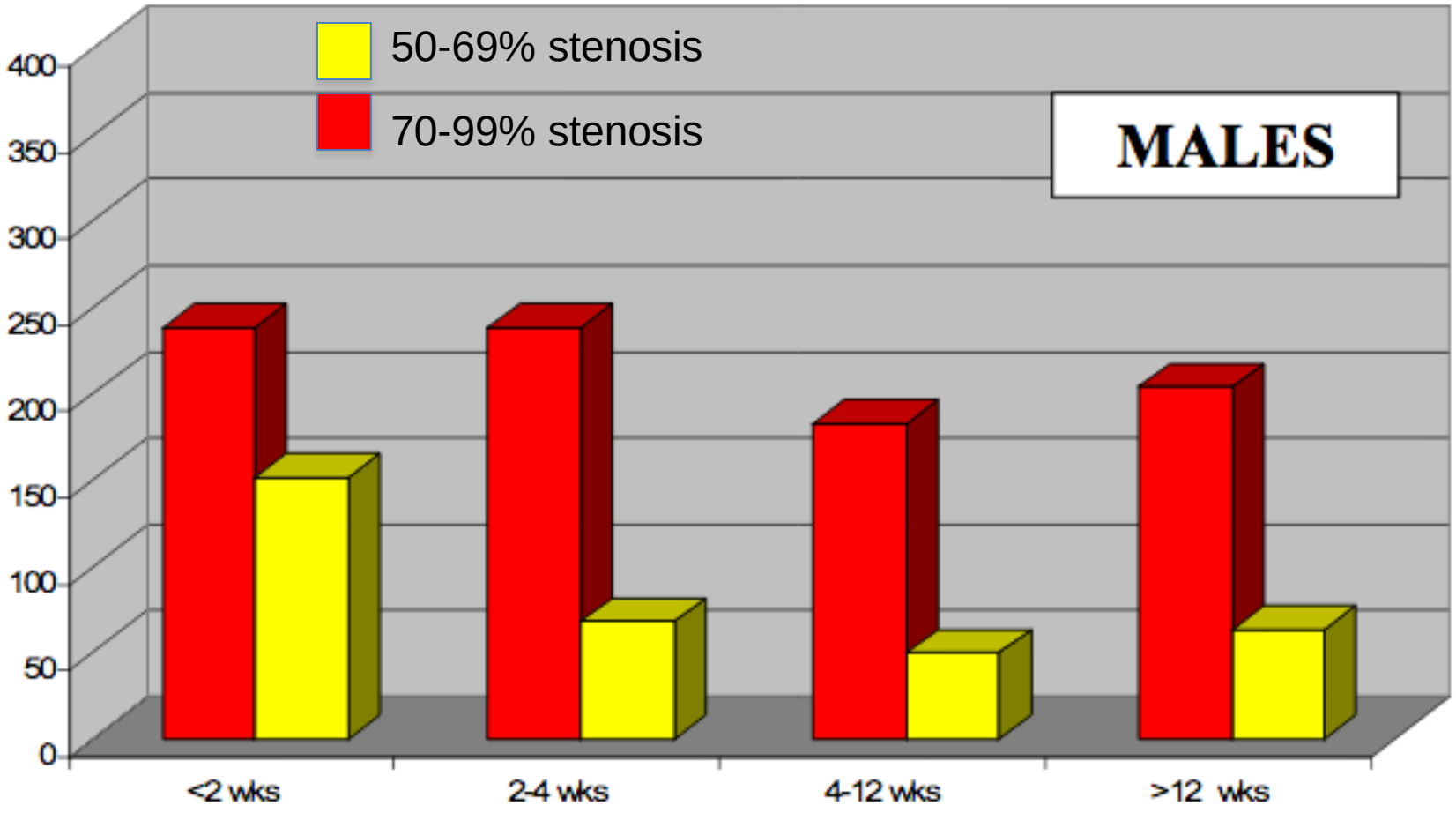
EUROPEAN SOCIETY OF CARDIOLOGY

No. of ipsilateral strokes prevented at 5 yrs by performing 1000 CEA with 50-99% stenosis



Rothwell 2004
Naylor 2007

Strokes prevented / 1000 CEAs in males



Rothwell 2004
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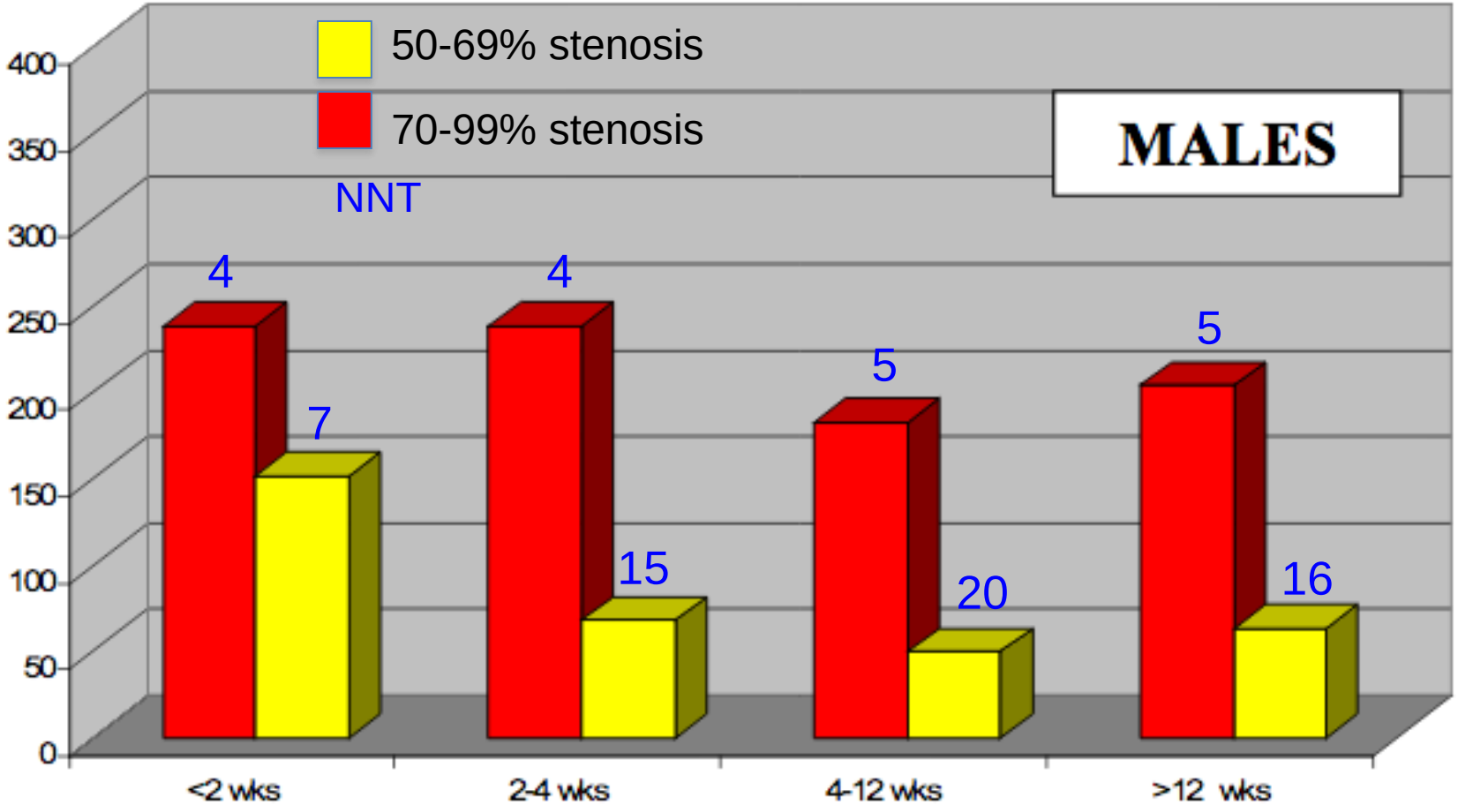
Strokes prevented / 1000 CEAs in males

NNT



Rothwell 2004
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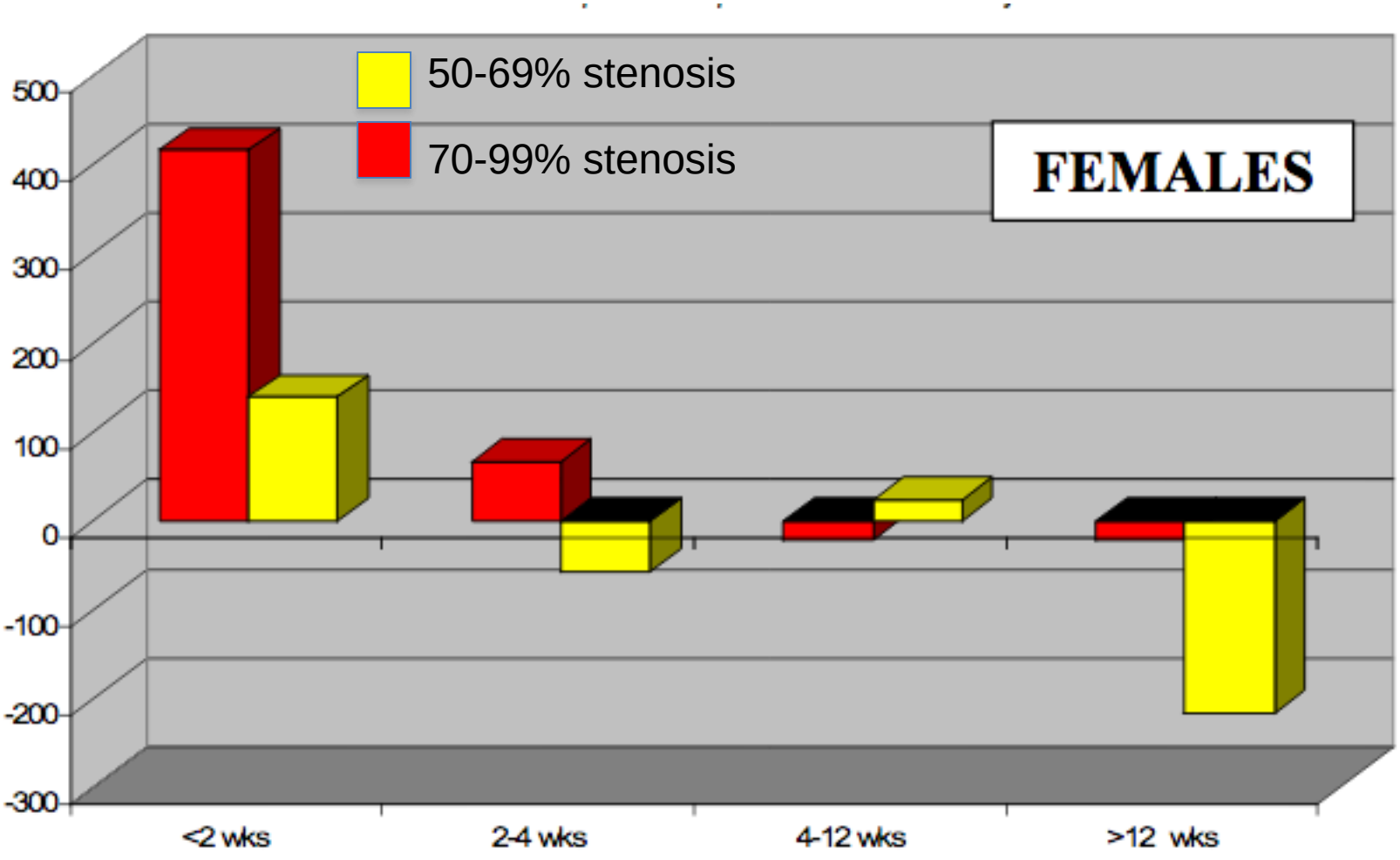
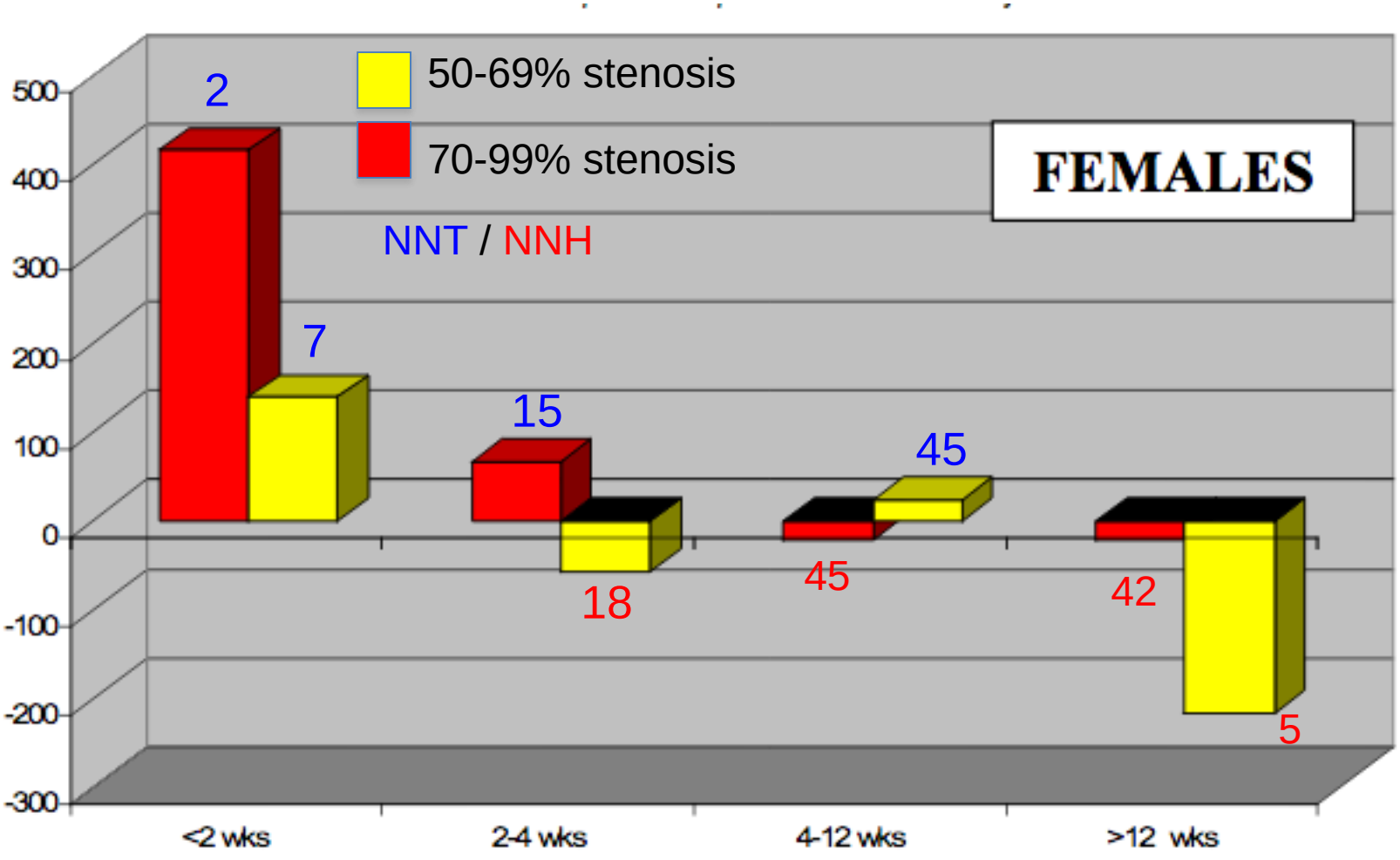


Rothwell 2004
Naylor 2007

Strokes prevented / 1000 CEAs in males

NNT / NNH



Rothwell 2004
Naylor 2007

Is it 2 days, 1 week or 2 weeks?

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What is the risk of stroke in relation to time after a TIA?

What is the risk of performing CEA at 2 days, 7 days, 2 weeks, > 2 weeks?

Risk of stroke in the hyperacute period after TIA in 50-99% carotid stenosis

	48 hrs	72 hrs	7 days	14 days
Fairhead 2005				20%
Purroy 2007			10%	
Ois 2009		17%	22%	25%
Bonifati 2011	8%			
Johansson 2013	5%		8%	11%
Merwick 2013			8%	
Marnane 2014	5%	9%	9%	16%

Naylor et al, 2015

Risk of stroke/death in relation of time interval between index event and CEA

	n	0-2 d	3-7 d	8-14 d	>14 d	OR (CI)
Strömberg 2016	2596	11.5%	3.6%	4%	5.4%	4.24 (2.07-8.70)
Nordanstig 2017	418	8%		2.9%		3.65 (1.14-11.67)
Avgerinos 2017	989	7.3%	4.3%	3.2%		

ABOVE THRESHOLD

6%

BELOW THRESHOLD

	n	0-2 d	3-7 d	8-14 d	>14 d
Tsantilas 2016	56336	3%	2.5%	2.6%	2.3%
Loftus 2016	23235	3.1%	2.5%	2.1%	2.6%
Sharpe 2013	475	2.4%	1.8%	0.8%	0.8%
Rantner 2015	761	4.4%	1.8%	4.4%	2.5%

REVIEW

Systematic Review and Meta-Analysis of Very Urgent Carotid Intervention for Symptomatic Carotid Disease

Eur J Vasc Endovasc Surg (2018) ■, 1–10

30 day risk of stroke after CEA

1 RCT and 9 observational studies

	n	0-2 d	≥ 2 days	*OR (CI)*	*P* value
CEA	**5,385**	**50/723 (6.9%)**	**148/4662 (3.1%)**	2.19 (1.46-3.26)	< .001

Milgrom 2018

Is it 2 days, 1 week or 2 weeks?

Stroke risk after TIA

2 days	1 week	2 weeks
5%	10%	20%

CEA can be performed after 2 days of event

divergent results re: within 48h

What about CAS in the hyperacute/acute period?

Predictors of Neurological Events Associated With Carotid Artery Stenting in High-Surgical-Risk Patients

Insights From the Cordis Carotid Stent Collaborative

Aronow et al 2010

n = 2104

Symptomatic
n = 505

Data available
n = 236

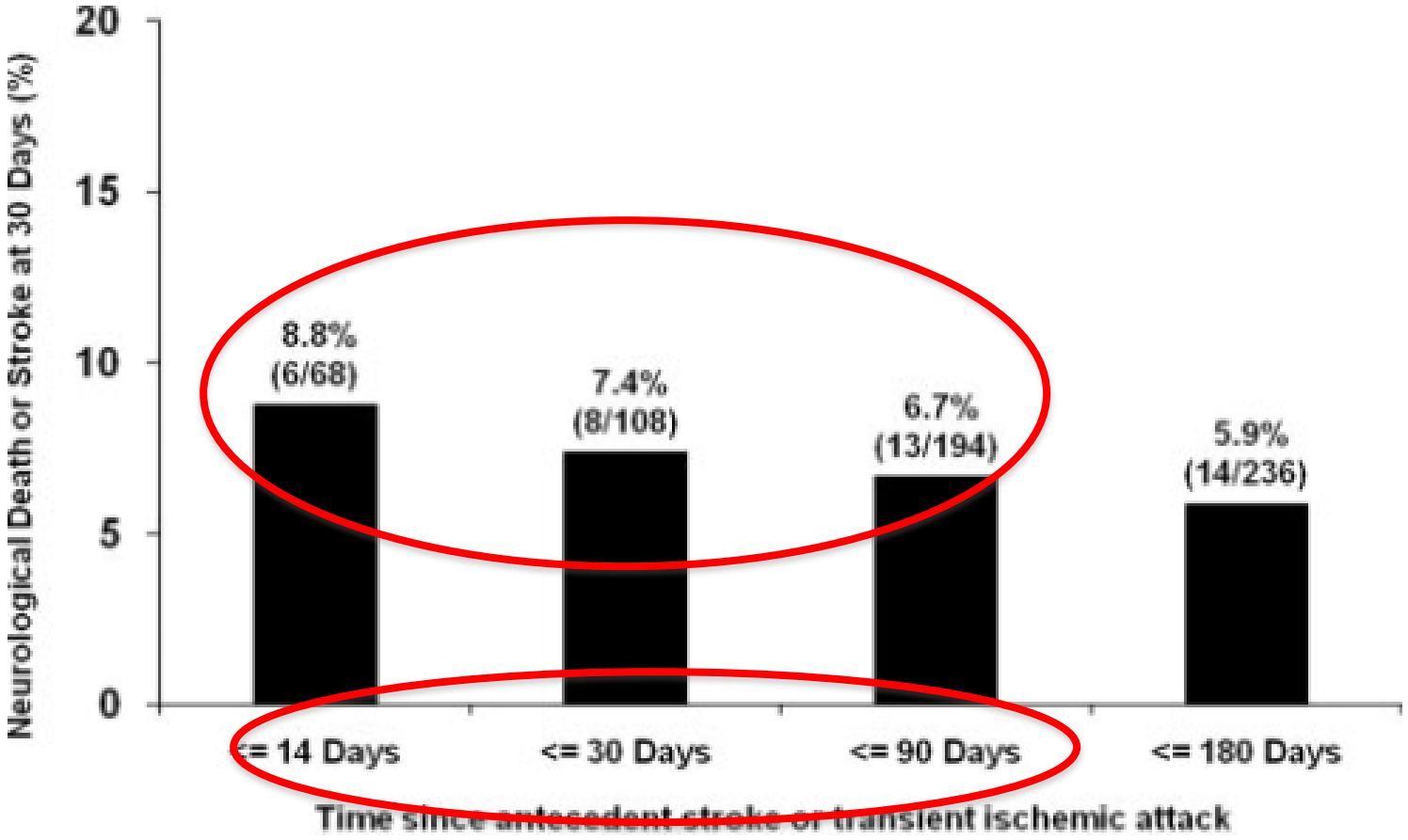

Figure 3. Time since antecedent stroke or TIA and 30-day risk of neurological death or stroke (n=236).

The CAPTURE Registry: Predictors of Outcomes in Carotid Artery Stenting With Embolic Protection for High Surgical Risk Patients in the Early Post-Approval Setting

Gray et al. 2007

n = 3500 → Symptomatic n = 482
(DS rate: 10.6%)

	0-13 days vs. others		14-30 days vs. others		31-180 days vs. others	
	P- value	OR (95% CI)	*P*- value	OR (95% CI)	*P*- value	OR (95% CI)
Stroke or TIA history	0.0047	2.52 (1.33, 4.78)	0.7071	0.79 (0.23, 2.68)	0.9067	1.04 (0.53, 2.06)

Early Endarterectomy Carries a Lower Procedural Risk Than Early Stenting in Patients With Symptomatic Stenosis of the Internal Carotid Artery

Results From 4 Randomized Controlled Trials

Rantner et al. 2017

n = 4138

Only 11% of CEA and 14% of CAS performed within 7 days of symptom onset

	30 day outcomes		OR (95% CI)	*P=*
	CEA	CAS		
Any stroke/death				
< 7 days	1.3%	8.4%	6.51 (2-21.2)	0.002
> 7 days	3.6%	7.1%	2 (1.5-2.7)	<.0001

Early Endarterectomy Carries a Lower Procedural Risk Than Early Stenting in Patients With Symptomatic Stenosis of the Internal Carotid Artery

Results From 4 Randomized Controlled Trials

Rantner et al. 2017

Conclusions—In randomized trials comparing stenting with CEA for symptomatic carotid artery stenosis, CAS was associated with a substantially higher periprocedural risk during the first 7 days after the onset of symptoms. Early surgery is safer than stenting for preventing future stroke.

What do contemporary guidelines say?

AHA/ASA Guideline

Guidelines for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack

(*Stroke*. 2014;45:2160-2236.)

2014

for the AHA statement on carotid revascularization to recommend that surgery be performed within 2 weeks if there was no contraindication (Class IIa; Level of Evidence B).[22]

ESC Guidelines on the diagnosis and treatment of peripheral artery diseases

European Heart Journal (2011) **32**, 2851–2906

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In symptomatic patients with indications for revascularization, the procedure should be performed as soon as possible, optimally within 2 weeks of the onset of symptoms.	I	B

2011

Updated Society for Vascular Surgery guidelines for management of extracranial carotid disease:

(J Vasc Surg 2011;54:832-6.)

2011

CEA once their condition has been stabilized. CEA should be performed within 2 weeks of the neurologic event (Grade 1, level of evidence B).

Patients who present with repetitive (crescendo) episodes of transient cerebral ischemia unresponsive to antiplatelet therapy should be considered for urgent CEA. The risk of intervention is increased over elective surgery for neurologic symptoms, but not as much as for patients with stroke in evolution. CEA is preferred to CAS in these patients based on the presumptive increased embolic potential of bifurcation plaque in this clinical situation (Grade 1, level of evidence C).

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

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

esvs

2017

Recommendation 40	Class	Level
When revascularisation is considered appropriate in symptomatic patients with 50—99% stenoses, it is recommended that this be performed as soon as possible, preferably within 14 days of symptom onset	I	A
Recommendation 41		
Patients who are to undergo revascularisation within the first 14 days after onset of symptoms should undergo carotid endarterectomy, rather than carotid stenting	I	A

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

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

esvs

2017

Recommendation 42	Class	Level
Revascularisation should be deferred in patients with 50—99% stenoses who suffer a disabling stroke (modified Rankin score ≥3), whose area of infarction exceeds one-third of the ipsilateral middle cerebral artery territory, or who have altered consciousness/ drowsiness, to minimise the risks of postoperative parenchymal haemorrhage	I	C
Recommendation 43		
Patients with 50—99% stenoses who present with stroke-in-evolution or crescendo transient ischaemic attacks should be considered for urgent carotid endarterectomy, preferably <24 hours	IIa	C

Stroke and transient ischaemic attack in over 16s: diagnosis and initial management

NICE National Institute for Health and Care Excellence

Published: 23 July 2008

Last updated: March 2017

- be assessed and referred for carotid endarterectomy within 1 week of onset of stroke or TIA symptoms
- undergo surgery within a maximum of 2 weeks of onset of stroke or TIA symptoms

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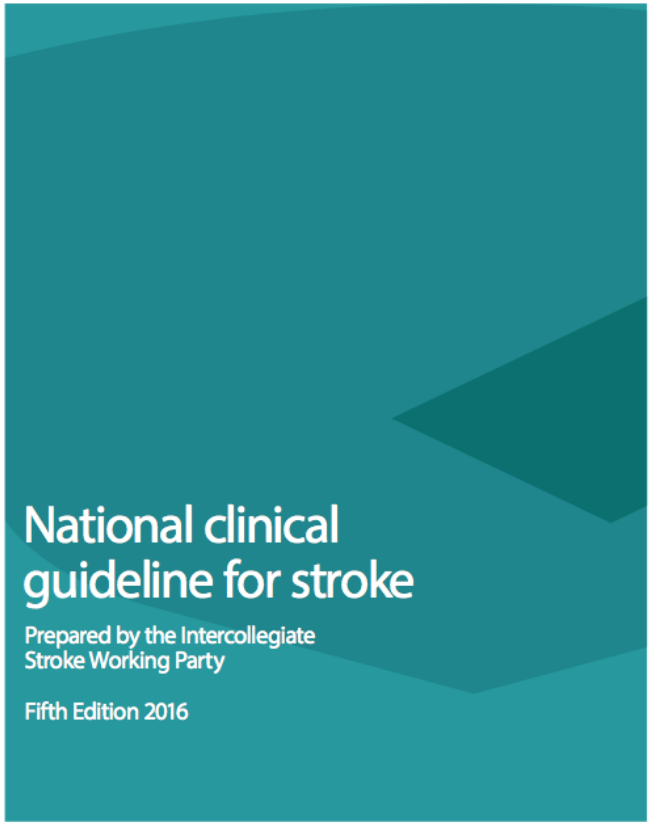
2016



E Patients with TIA or an acute non-disabling stroke with stable neurological symptoms who have symptomatic severe carotid stenosis of 50–99% (NASCET method) should:

– be assessed and referred for carotid endarterectomy to be performed as soon as possible within 7 days of the onset of symptoms in a vascular surgical centre routinely participating in national audit;

GETTING IT RIGHT FIRST TIME

Vascular Surgery

GIRFT Programme National Specialty Report

by Professor Michael Horrocks
GIRFT Clinical Lead for Vascular Surgery

March 2018

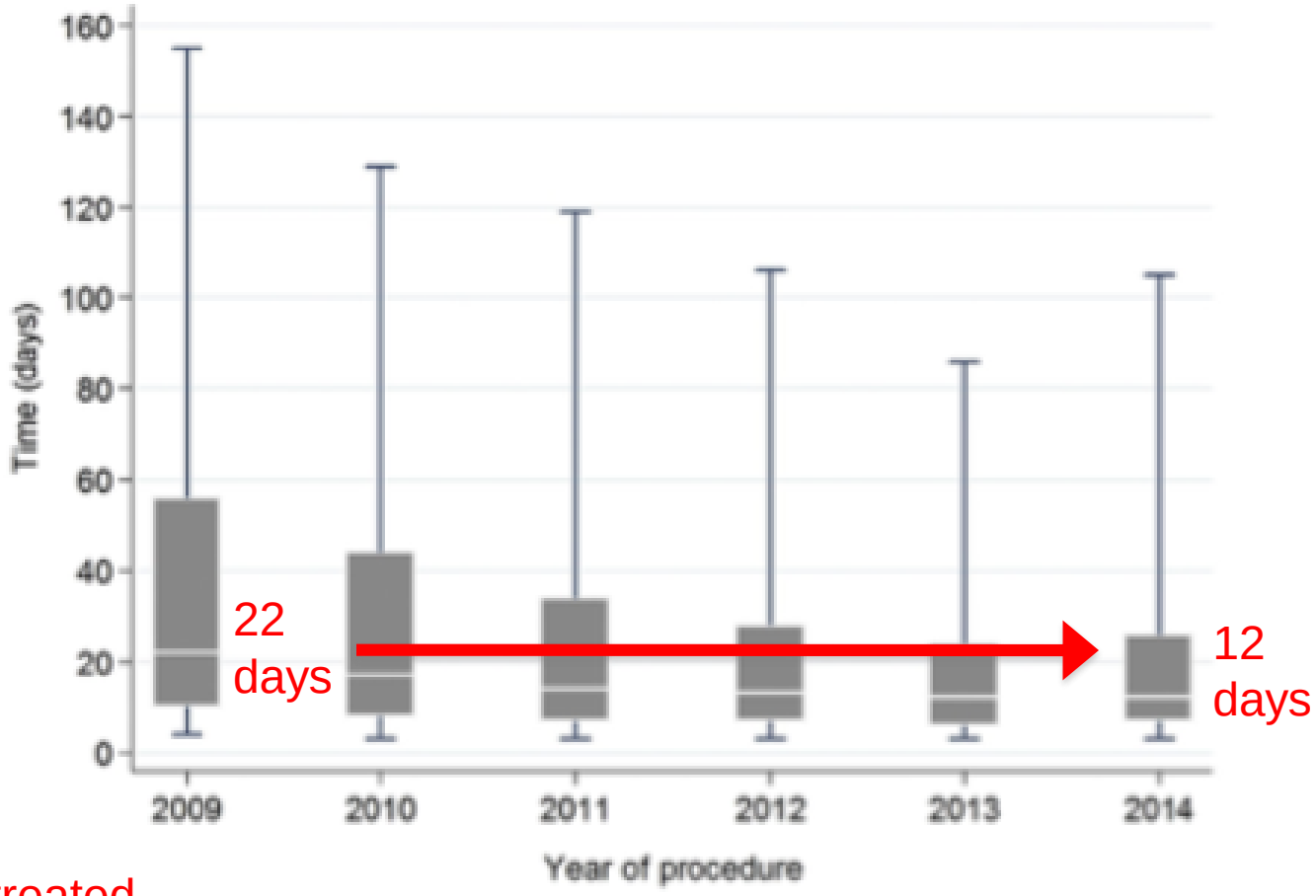
Recommendation	Actions
2. Reduce the time from presentation to surgery for all patients in need	**2A:** Clinicians and providers to reduce presentation to operation to within seven days of onset of stroke or TIA symptoms, as recognised as desirable in the existing service specification, reflecting high risk of

Are we performing CEAs within 2 weeks?

Distribution time from index symptoms to CEA by year

Loftus et al 2016

n = 23,235



% treated with 2 weeks

37% → 58%

Are we compliant with 2 weeks period?

Study	n	CEA within 2 weeks
Tsantilas 2016 	56,336	78%
Karthaus 2018 	5,158	75%
Kjørstad 2017 	368	61.7%
NVR 2018 	4,148	59%

Summary

- When indicated, carotid intervention should be performed ASAP and within 1 week. CEA rather than CAS should be considered.
- No evidence of increased procedural risks when performed after day 2 of index symptoms
- CEA within 48h has divergent results.
- 2 out of 5 CEAs in the UK are performed > 2 weeks….