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***Why I stent asymptomatic and  
symptomatic patients***

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## Evidence for treating ...

- symptomatic patients
- asymptomatic patients

# CETC

*Carotid Endarterectomy Trialists Collaboration*

- combined ALL of the data from ECST, NASCET & VA
- 5,893 patients in database
- 33,000 patient years follow-up
- all angiograms reanalysed using NASCET method

# CETC

## ipsilateral stroke at 5 years including operative risk

stenosis	CEA	BMT	ARR	NNT	CVE/1000
<30%	12.05%	9.78%	-2.2%	-	-
30-49%	14.78%	18.06%	3.2%	31	32
50-69%	13.61%	18.18%	4.6%	21	46
70-99%	10.36%	26.24%	15.9%	6	159
near occlusion	16.82%	15.15%	-1.7%	-	-

# CETC

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# AHA Guidelines 2006

For patients with TIA or ischemic stroke within the last six months and ipsilateral severe (70-99%) stenosis, CEA *by a surgeon with a peri-operative morbidity/mortality of <6%* is recommended.  
(Class I, Evidence level A)

# AHA Guidelines 2006

For patients with TIA or ischaemic stroke within the last six months and ipsilateral severe (70-99%) stenosis, CEA *by a surgeon with a peri-operative morbidity/mortality of <6%* is recommended.

(Class I, Evidence Level A)

For patients with TIA or ischaemic stroke within the last six months and ipsilateral moderate (50-69%) stenosis, CEA is recommended, depending on patient specific factors such as age, gender, co-morbidity and severity of initial symptom.

(Class I, Evidence Level A)

# Factors Influencing Benefit

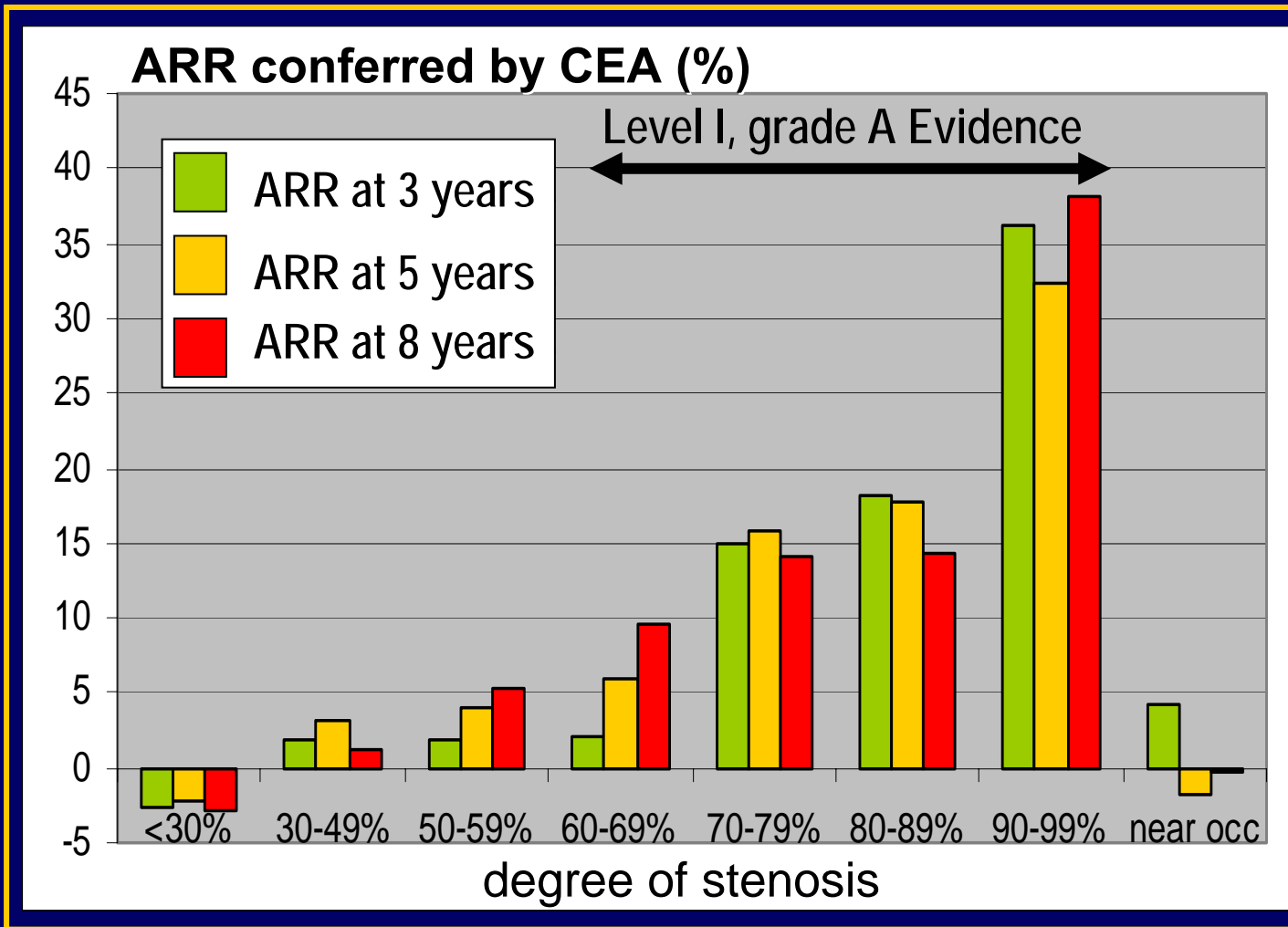
The assumption that all patients have the same risk/benefit is flawed

achieving maximum benefit:

- incremental stenosis
- age
- rapid intervention
- gender
- plaque morphology
- contralateral  
occlusion
- operative risk



# Incremental Stenosis



# Conclusion

*You cannot treat symptomatic patients with '50-99% stenoses' as being a homogenous group of equal risk.*

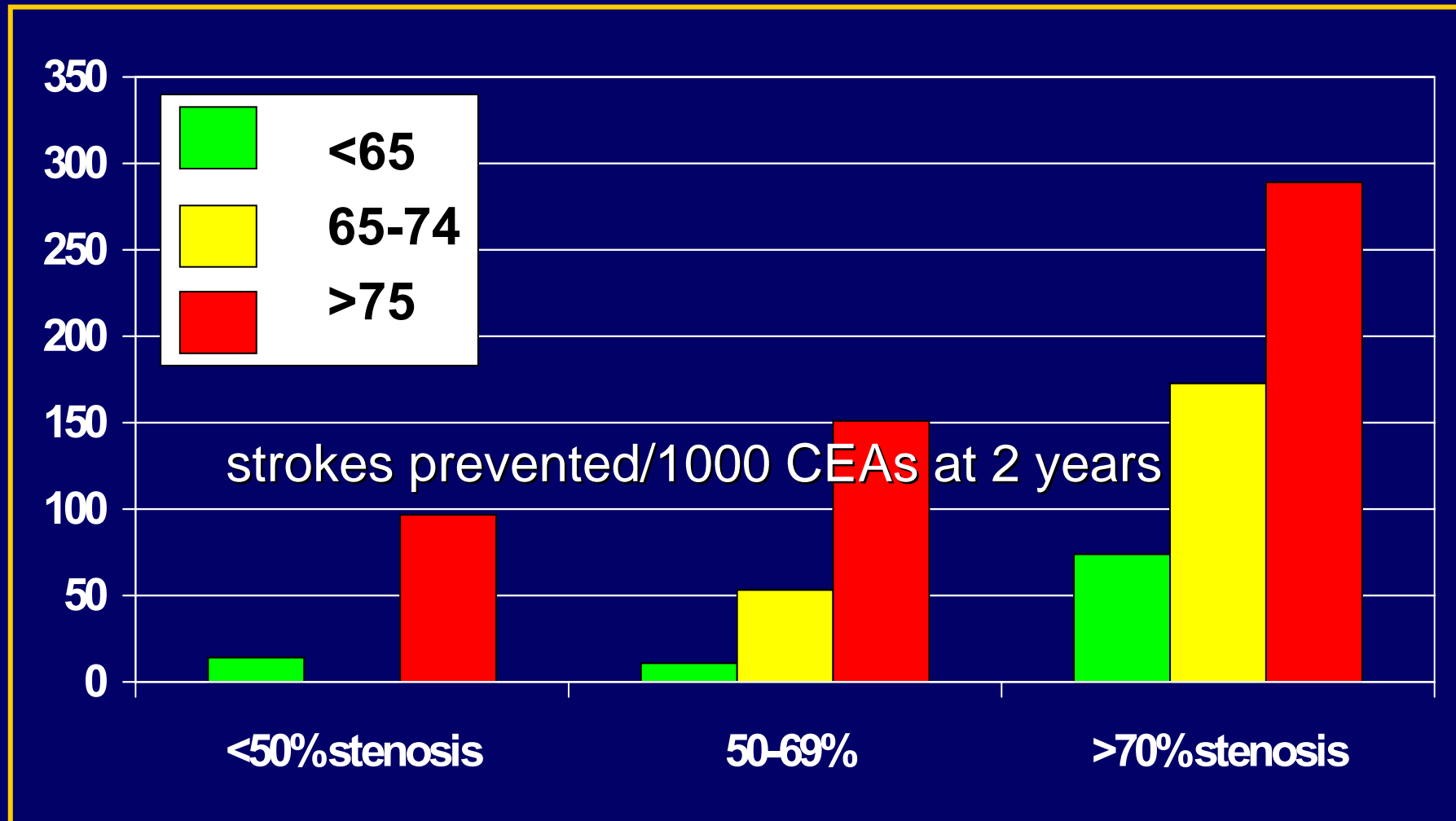
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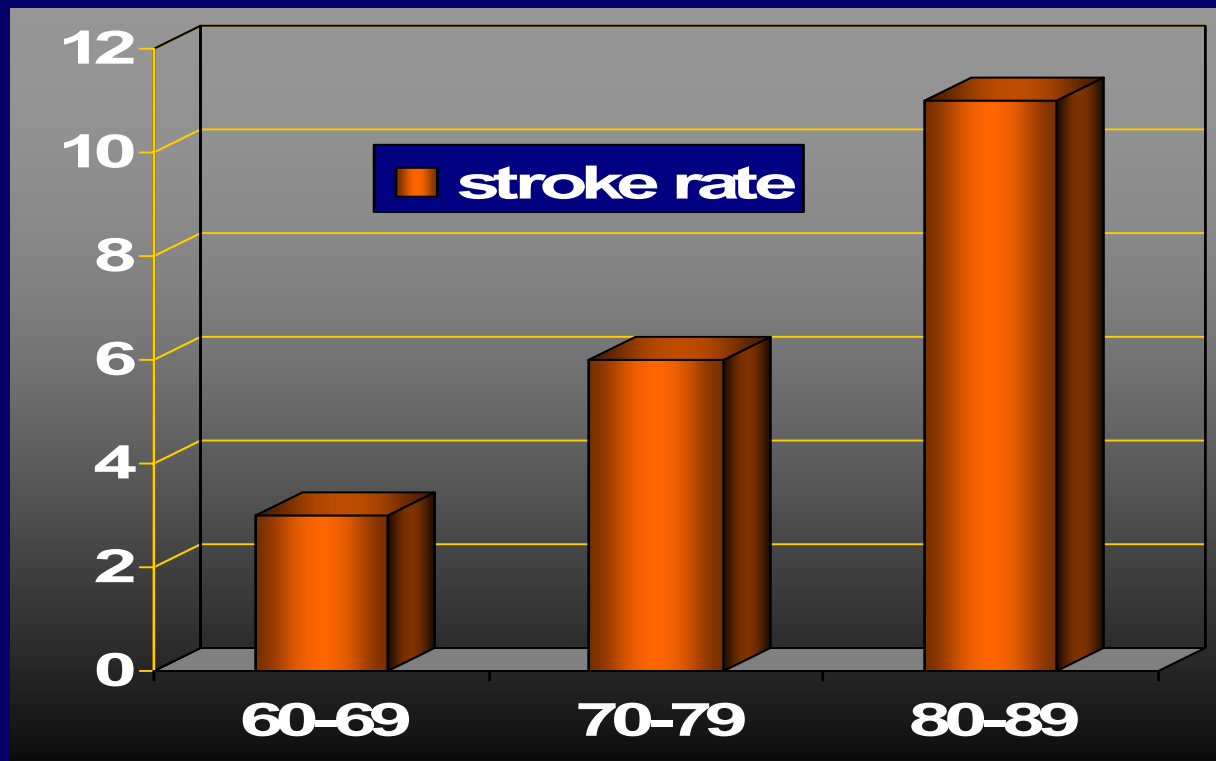
# Effect of Age on Benefit from CEA



adapted from NASCET 2001

# Effect of Age on Benefit from CAS

Stroke rates increase with age



adapted from ProCAS, Lennox Hill etc.

# Conclusion

*The general feeling that elderly patients do not gain significant benefit because of an increased procedural risk is unsustainable.*

*They have the most to gain!*

*But CAS must keep the 6% limit!!!*

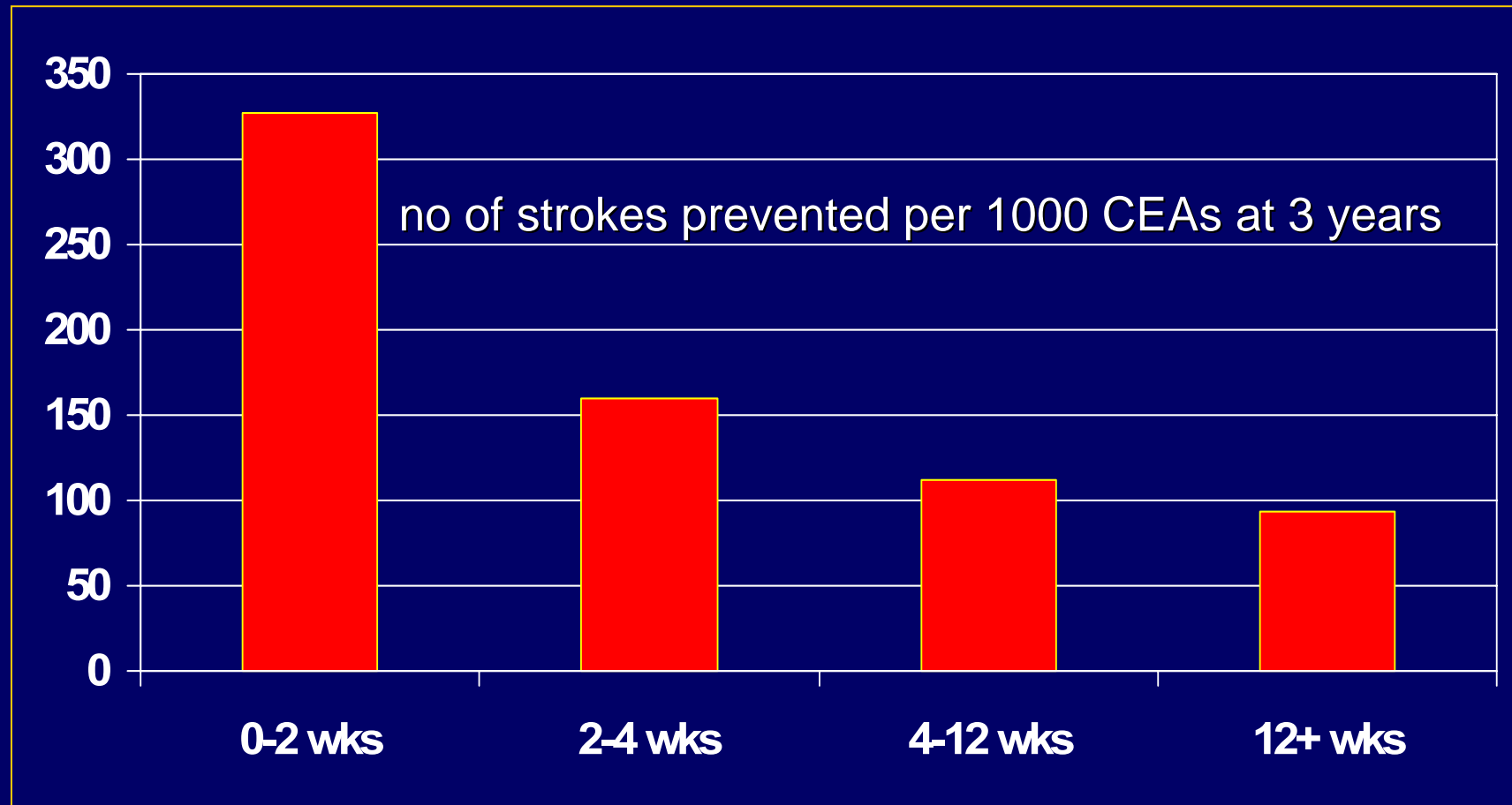
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# Rapid Tx of Symptomatic Patients



time from last event to randomisation

*adapted from Rothwell 2004*



# Conclusion

*Every third stroke is a second stroke!  
ICA stenosis should be treated as early  
as reasonably possible, regardless of  
the invasive method used.*

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# Factors Influencing Benefit

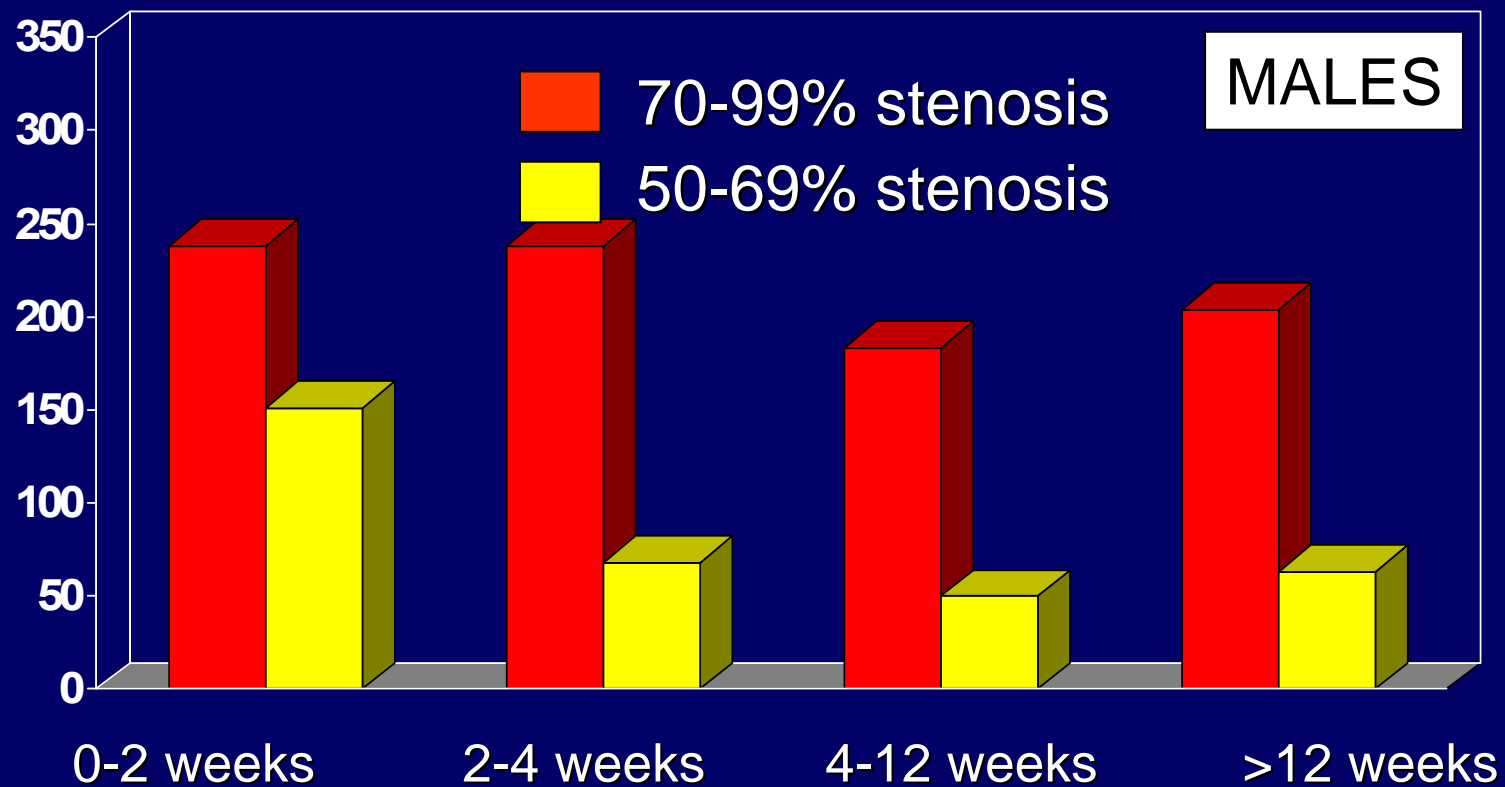
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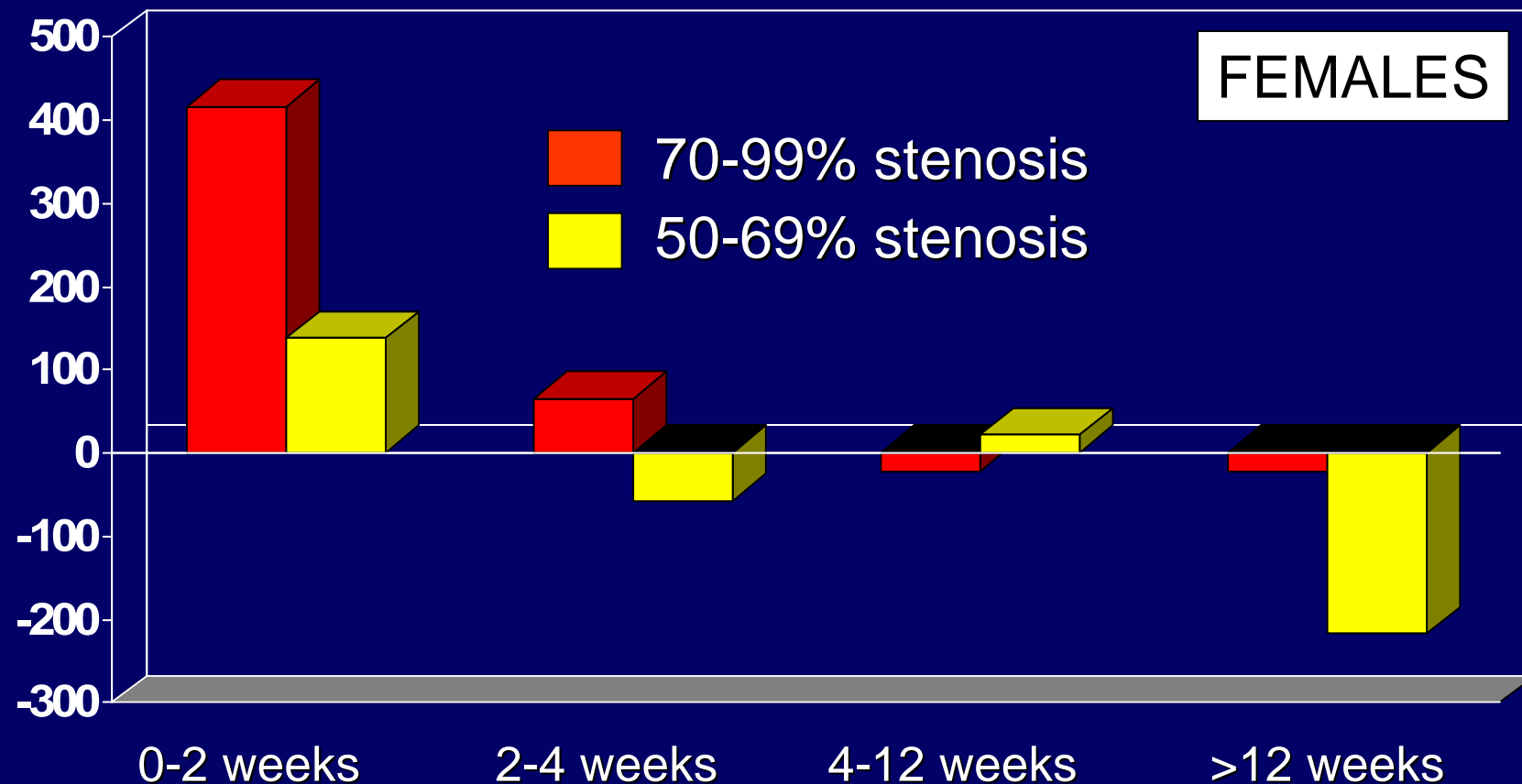
# Gender, Delay & Stenosis Severity

Strokes prevented/1000 CEAs at 5 years



# Gender, Delay & Stenosis Severity

Strokes prevented/1000 CEAs at 5 years



# Conclusion

*It is an uncomfortable observation that unless women with moderate stenoses receive treatment within a month of symptoms, they gain little benefit but face all the risks. They should not be considered 'high-risk'*

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# Influence of Plaque Morphology

smooth stenosis

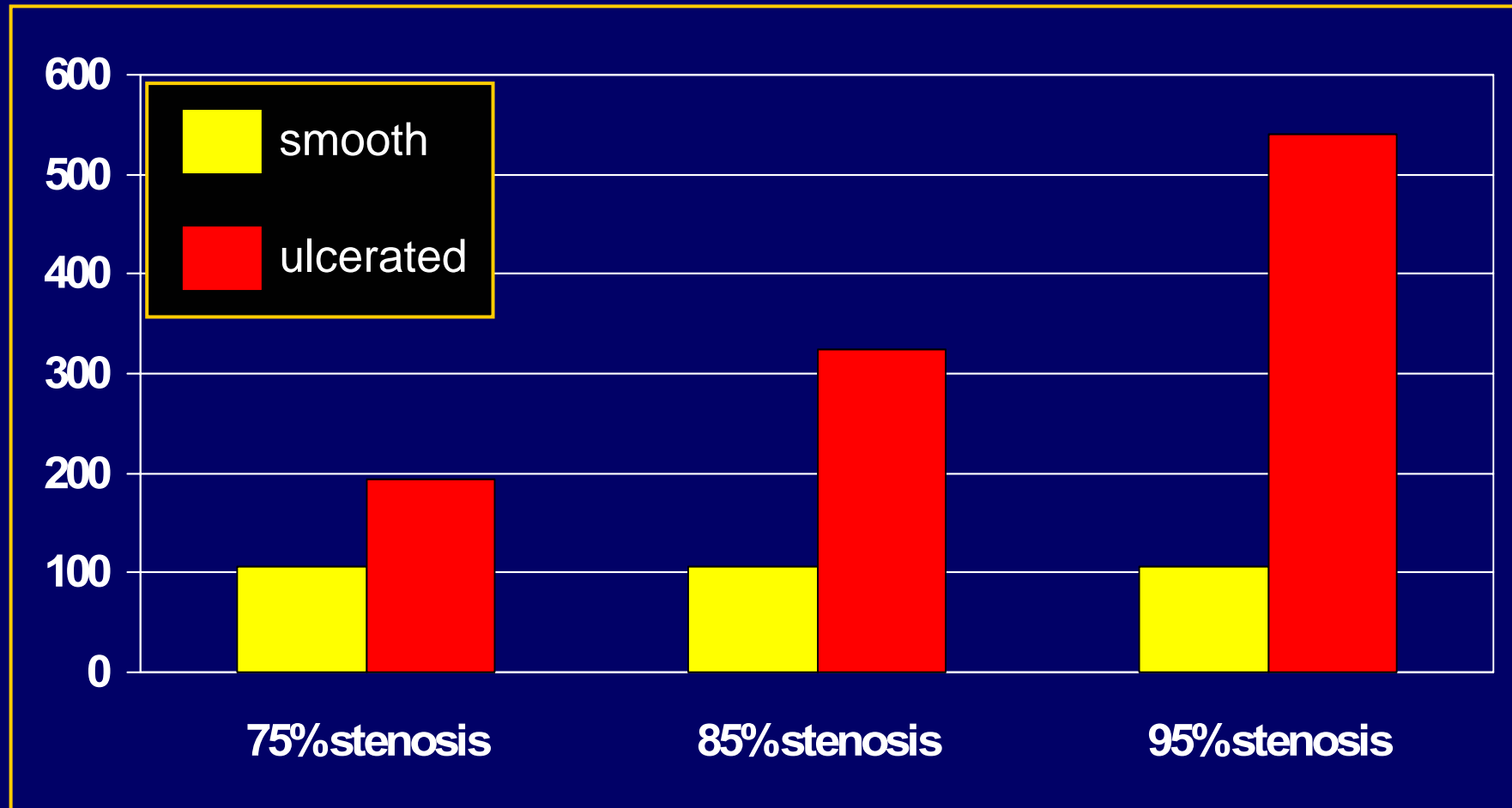


ulcerated stenosis



# CEA confers benefit in ulcerated stenoses

ipsilateral strokes prevented/1000 CEAs at 2 years



adapted from NASCET 1994



# Conclusion

*There has been much debate about the merits of studying plaque morphology. A simple assessment of whether the surface is irregular or smooth could have immense predictive benefit.*

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# Factors Influencing Benefit

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achieving maximum benefit:

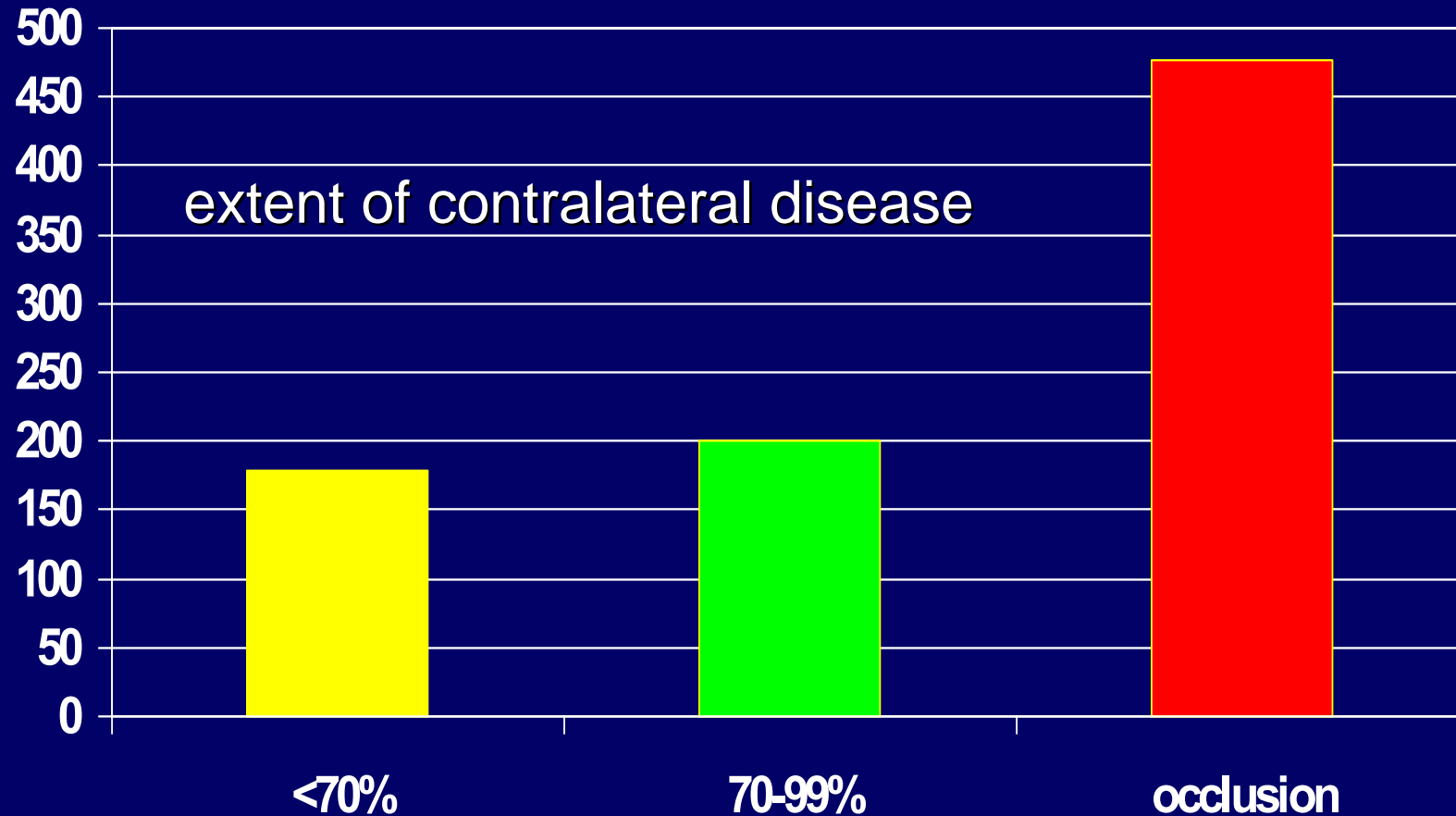
- incremental stenosis
- age
- rapid intervention
- gender
- plaque morphology
- contralateral ICA  
occlusion
- operative risk

# Stenosis & Contralateral Occlusion



# Effect of Contralateral Disease

No of ipsilateral strokes prevented per 1000 CEAs at 2 years



NASCET 1995

# Conclusion

*In parallel with plaque irregularity, the presence of contra-lateral occlusion is the single biggest predictor of benefit from intervention. NASCET stroke risk of 14.7% or SPACE with 13.0% much higher than with CAS (~5%)!*

# Factors Influencing Benefit

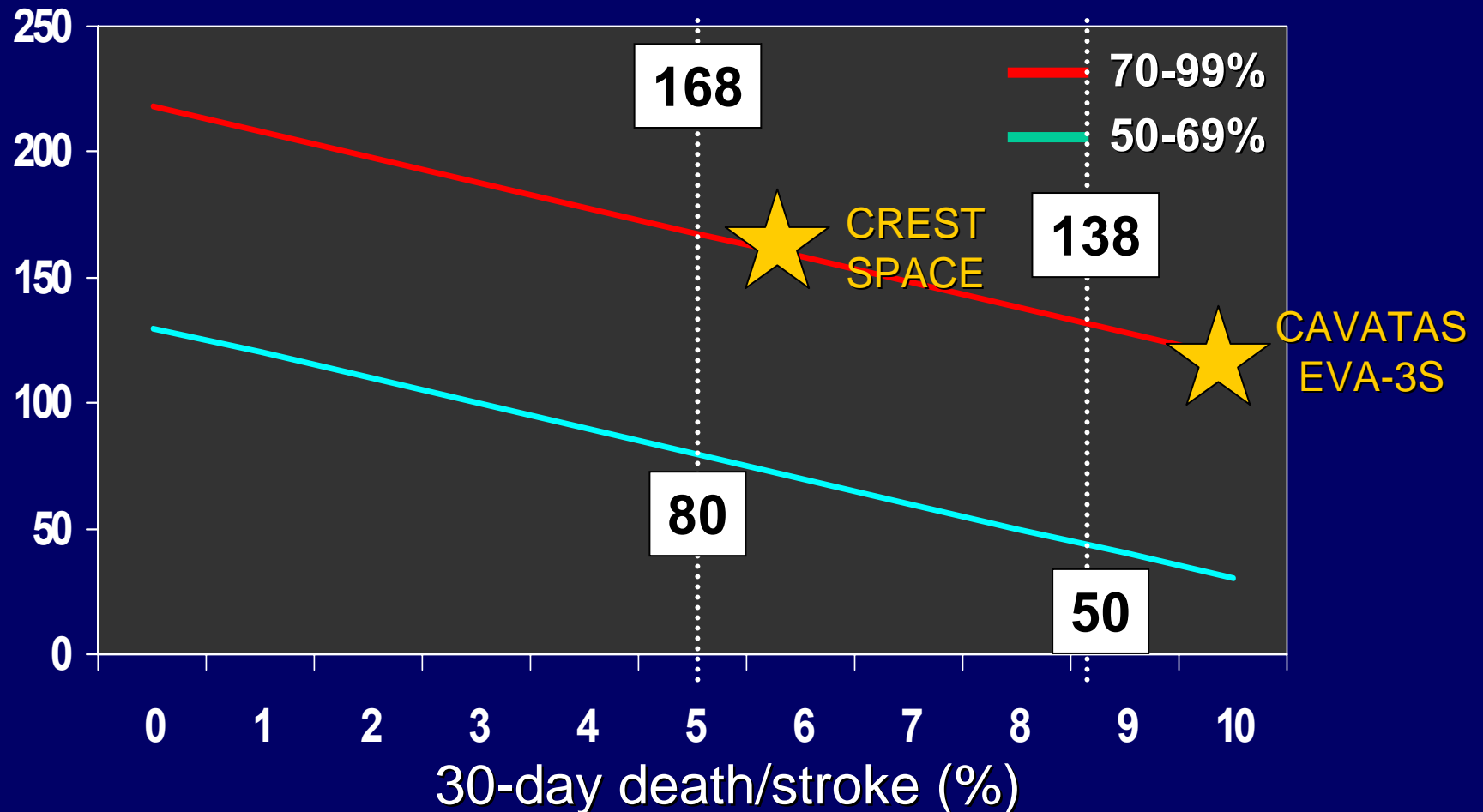
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# Effect of 30-d Risk on Outcome

CVEs prevented at 5 years per 1000 patients



# Benefit of CAS

## US Carotid Stent Registries

**30-day composite endpoint** (stroke, MI, death)

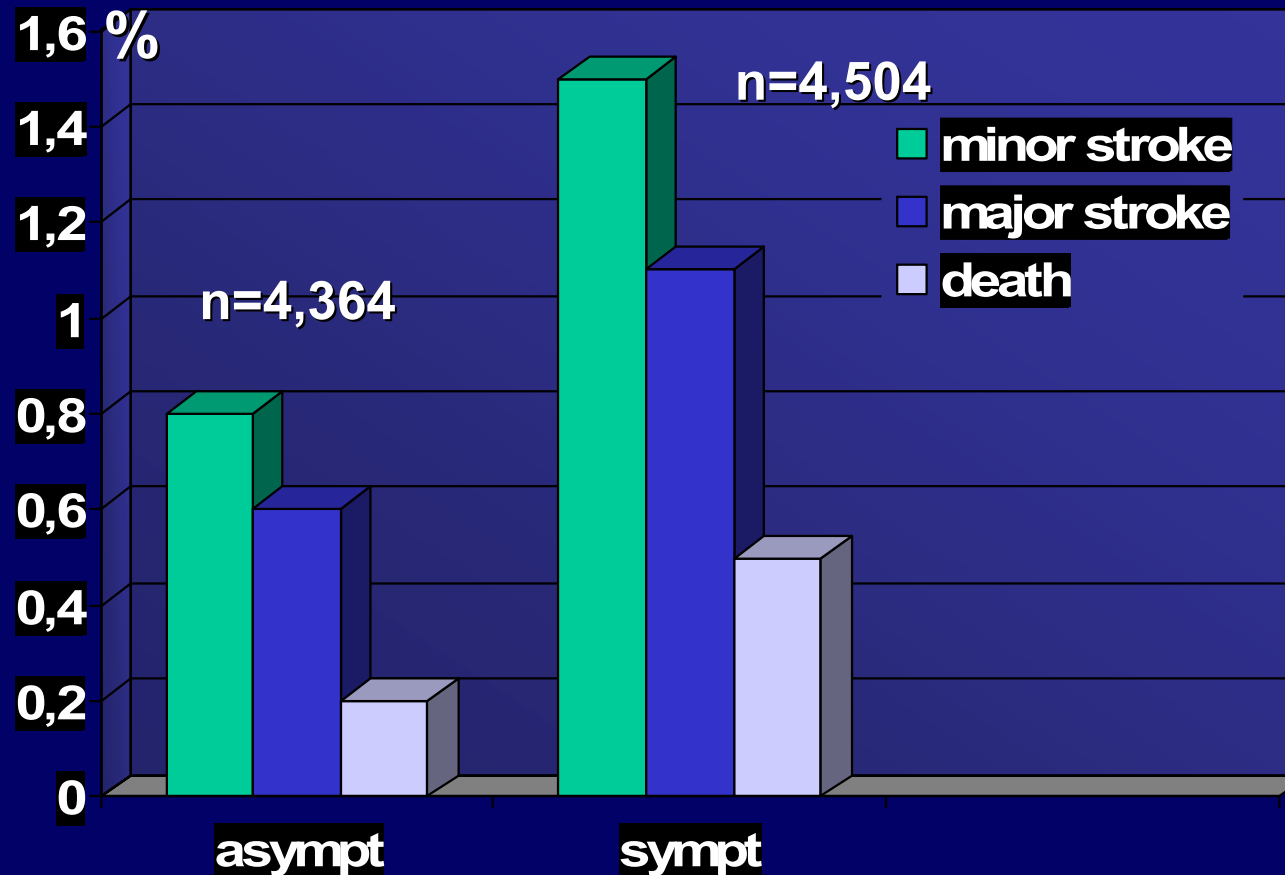
<b>CABERNET</b>	<b>3.8%</b>
<b>BEACH</b>	<b>5.4%</b>
<b>SECURITY</b>	<b>7.2%</b>
<b>ARCHER 2</b>	<b>7.8%</b>
<b>SAPPHIRE</b>	<b>7.8%</b>



# ProCAS Registry

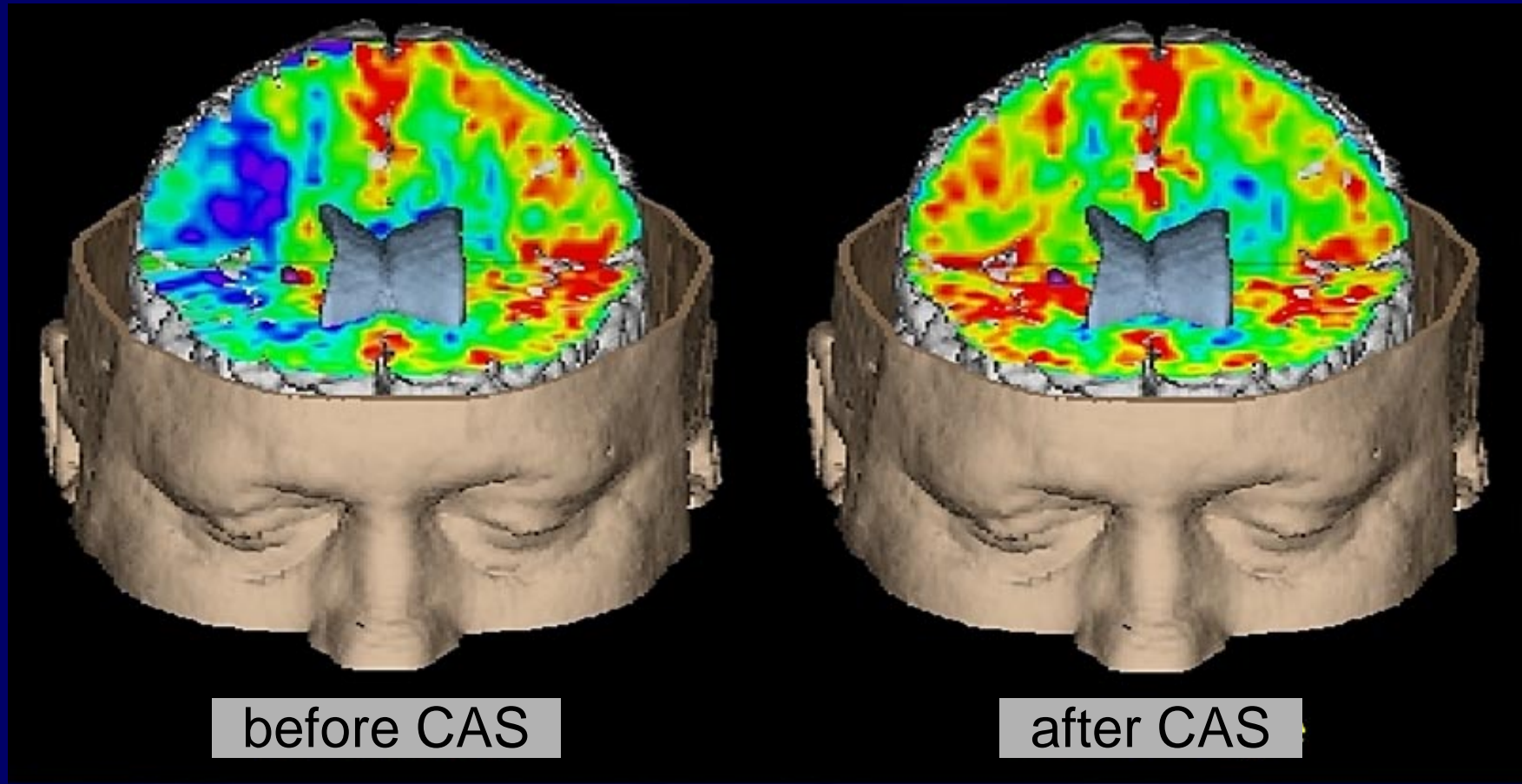
## Complications

Comparison asymptomatic/symptomatic pts.



Jul-1, 1999 - Dec-31, 2007

# Benefit is visible



# Conclusion

*No surgeon or interventionist can justify offering treatment on the basis of the International Trials if his procedural risks are out of accepted guidelines.  
Personal audit is mandatory.*

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## Evidence for treating ...

- **symptomatic patients**
  - **asymptomatic patients**
-

# ACAS & ACST Findings

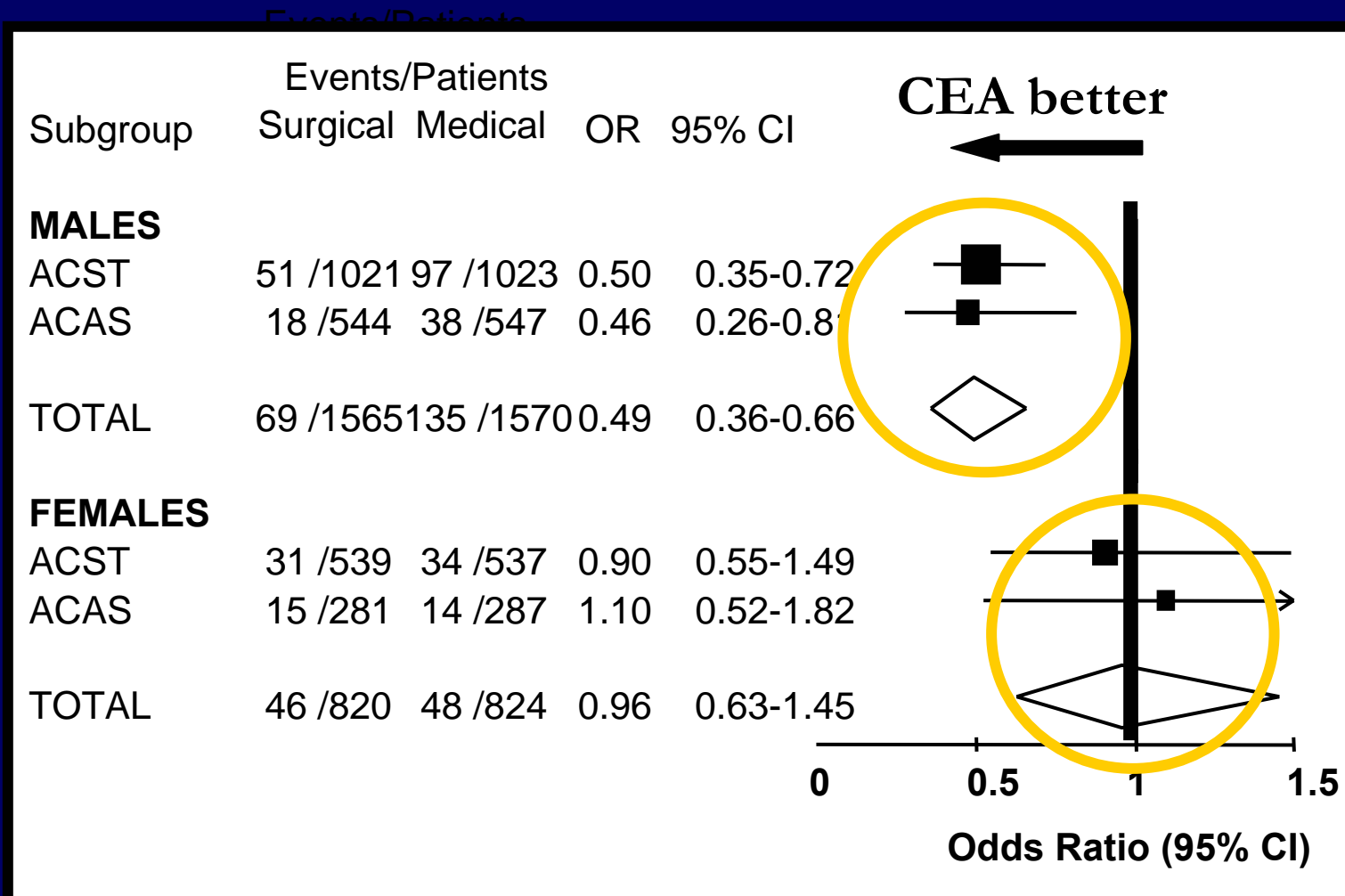
	5 year stroke risk surgery	BMT	ARR	RRR	NNT	CVE/ 1000
ACAS (n=1662)	5.1%	11.0%	5.9%	54%	17	59
ACST (n=3120)	6.4%	11.8%	5.4%	46%	19	53

ACAS, 1995    ACST, 2004

# Principle Messages from ACST

- ❖ maximum benefit in patients aged <75 years
- ❖ no evidence of benefit in patients aged >75 yrs
- ❖ 'apparent' benefit for men *and* women
- ❖ 50% reduction in disabling/fatal stroke

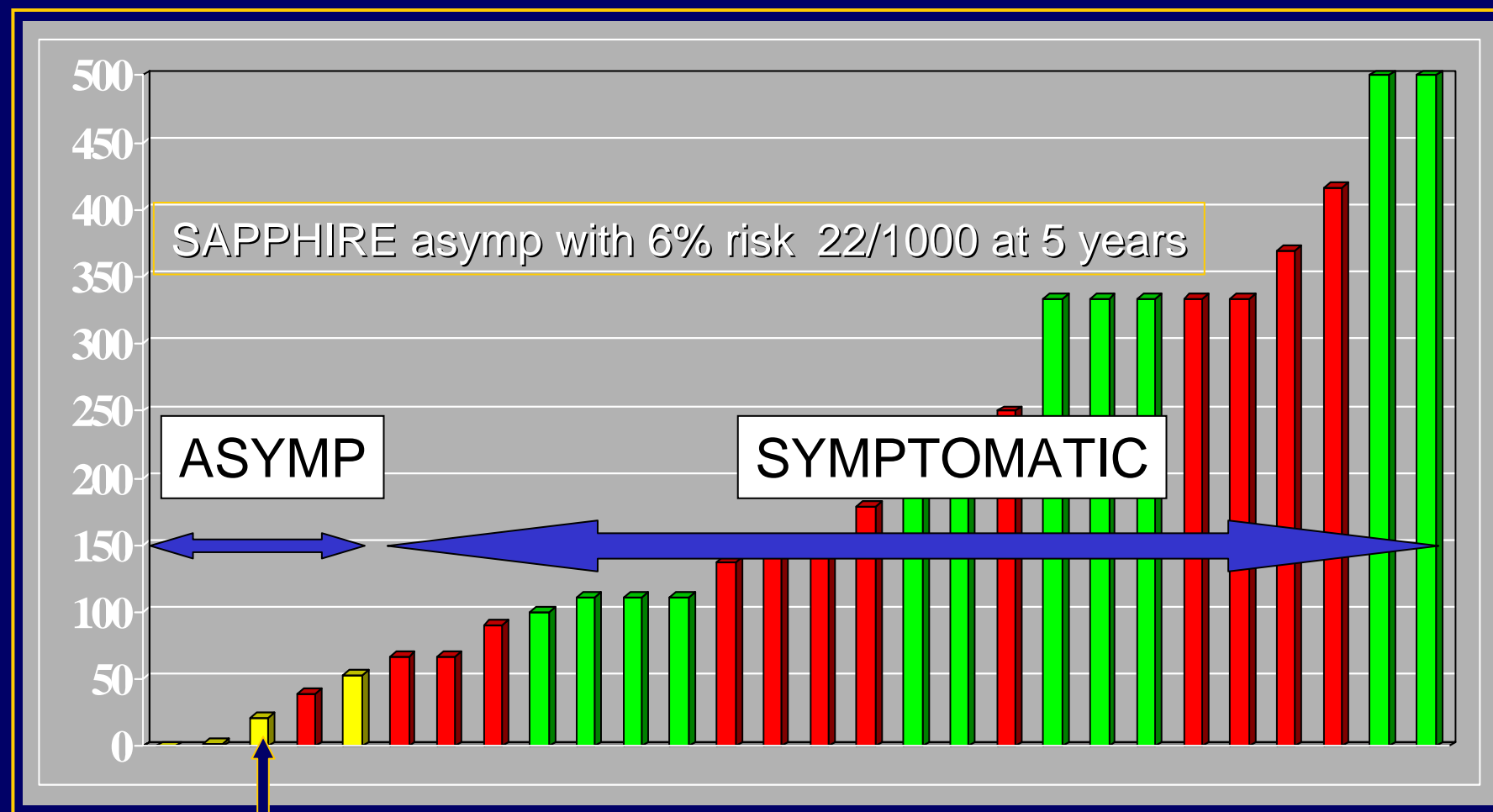
# Benefit in Women?



ACAS, 1995 ACST, 2004

P.M. Rothwell Lancet 2004

# Strokes Prevented per 1000 CEAs



**SAPPHIRE**

source: ACAS, ACST, ECST & NASCET



## *Parting message.....*

Irrespective of any debate about which asymptomatic patient should be treated, whether CEA or CAS is safer, how and by whom CAS should be performed, ALL pale into insignificance compared with the effect of delay in treating symptomatic patients with severe carotid artery disease.

*Thank you for your interest*

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**“What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?”**