

# **Stroke Risk and Its Etiology During CAS**

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# Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

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  - Ownership/Founder
  - Intellectual Property Rights
  - Other Financial Benefit
- Medtronic, Baxter, Gilead

# Stroke Risk During CAS

## Patient-related risk

Clinical (age, symptom status, renal insufficiency)

Anatomic complexity

## Operator-related risk

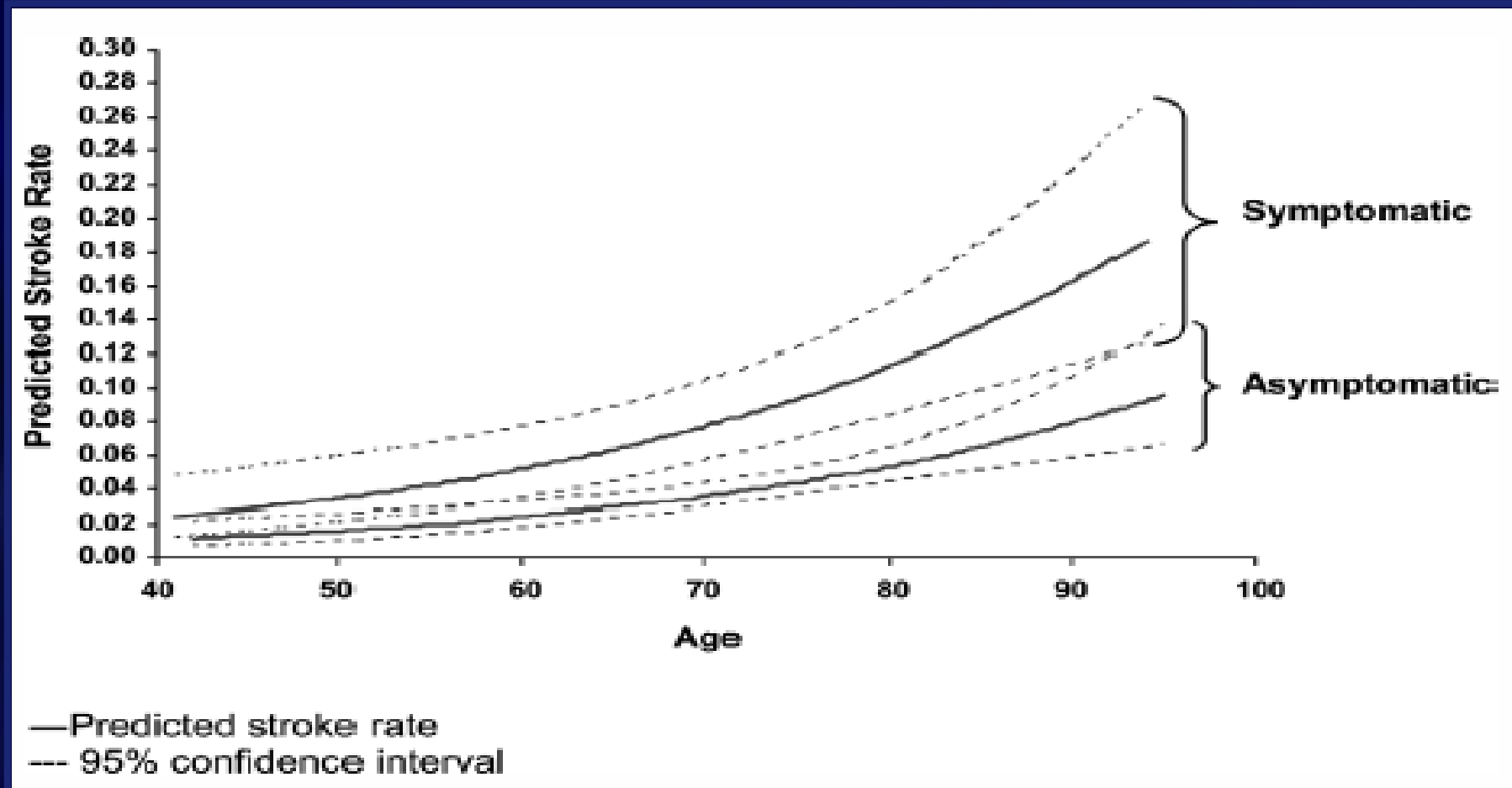
Experience

Device selection: Stent design and embolic protection

method

# Who is at High Risk for CAS?

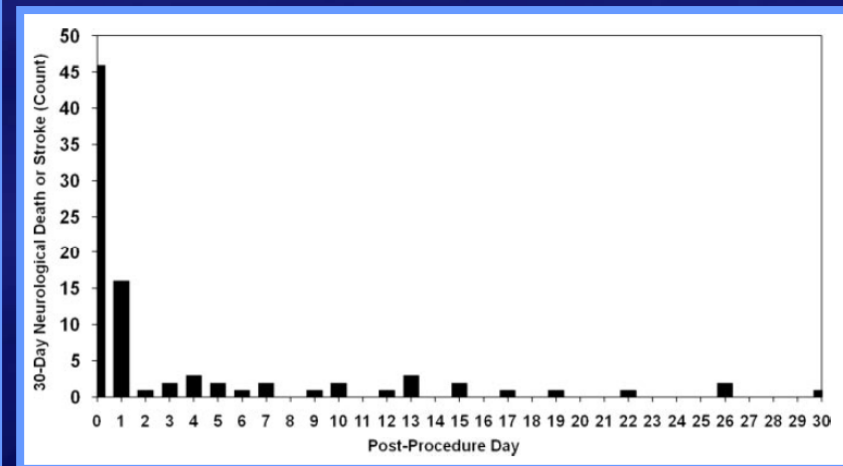
## Impact of Age and Symptom Status



# Incidence of Stroke During CAS

## Cordis Carotid Stent Collaborative

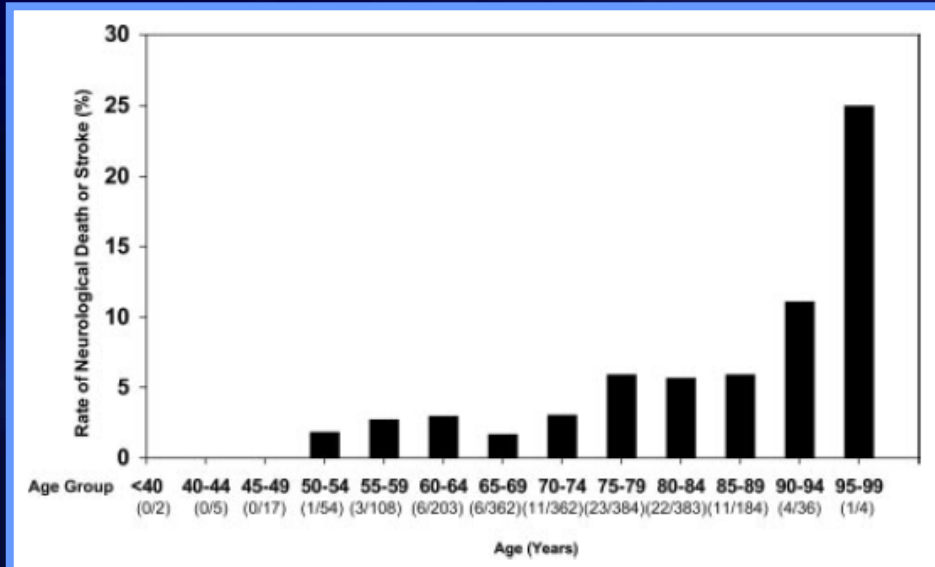
Variable	Asymptomatic (n=1584)	Symptomatic (n=505)	All Patients (n=2089)	P
Neurological death or any stroke	3.8 (60)	5.3 (27)	4.2 (87)	0.12
Death, any stroke, MI	5.1 (81)	6.9 (35)	5.6 (116)	0.12
Death	1.5 (23)	1.0 (5)	1.3 (28)	0.51
Cardiac death	0.6 (10)	0.6 (3)	0.6 (13)	1.0
Noncardiac death	0.3 (5)	0.2 (1)	0.3 (6)	1.0
Neurological death	0.5 (8)	0.2 (1)	0.4 (9)	0.70
MI	1.0 (16)	1.8 (9)	1.2 (25)	0.16
Stroke	3.7 (59)	5.3 (27)	4.1 (86)	0.12
Major ipsilateral stroke	1.1 (17)	2.6 (13)	1.4 (30)	0.018
Major nonipsilateral stroke	0.3 (4)	0.2 (1)	0.2 (5)	1.0
Minor ipsilateral stroke	2.0 (31)	2.2 (11)	2.0 (42)	0.72
Minor nonipsilateral stroke	0.5 (8)	0.8 (4)	0.6 (12)	0.50



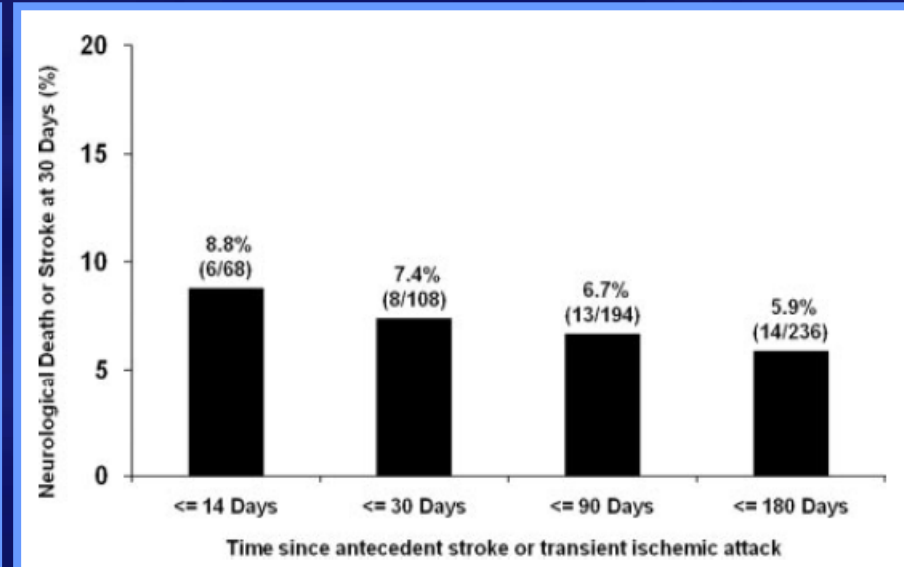
# Incidence of Stroke During CAS

## Cordis Carotid Stent Collaborative

### Impact of Age

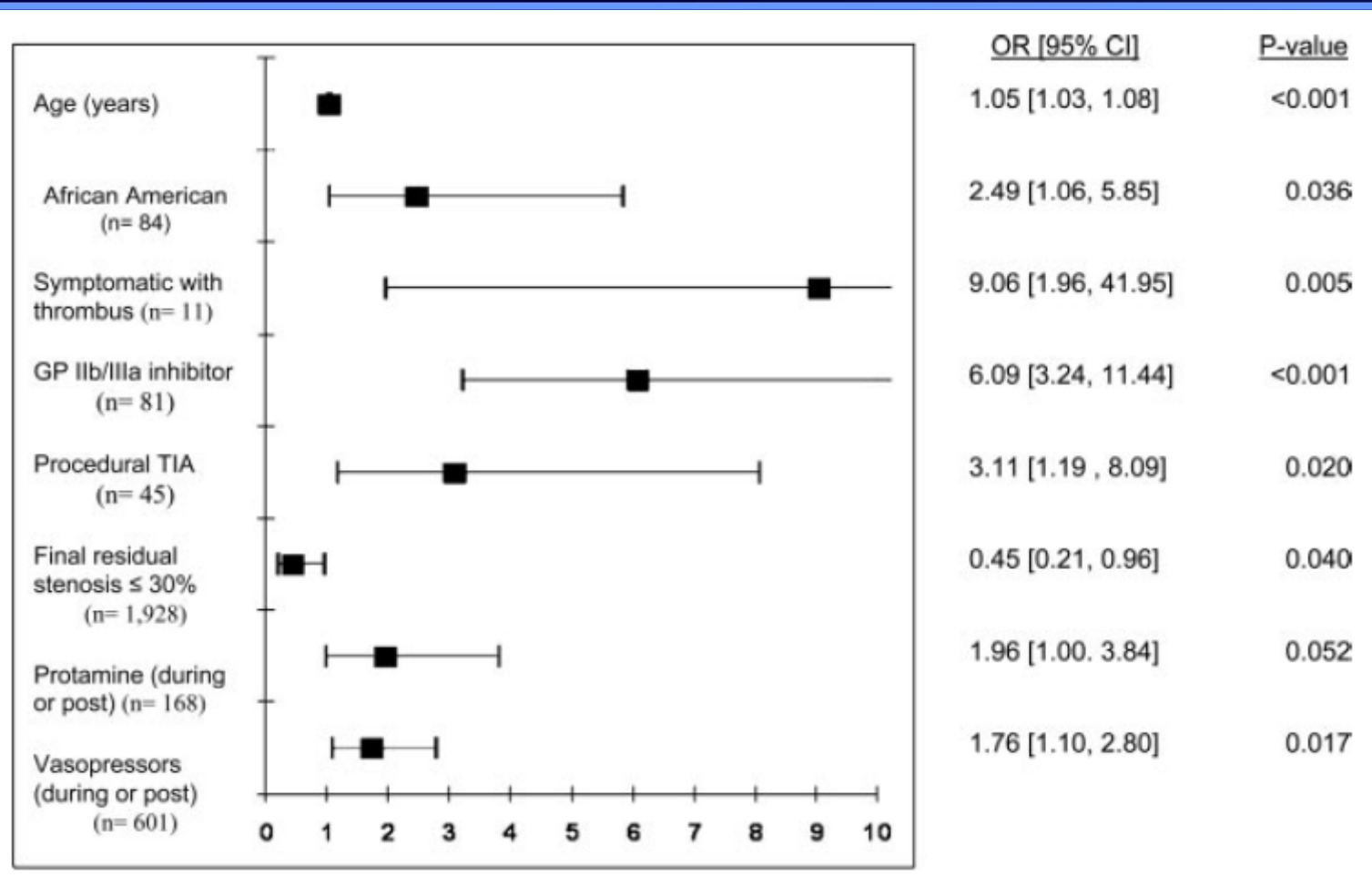


### Impact of Symptoms Timing



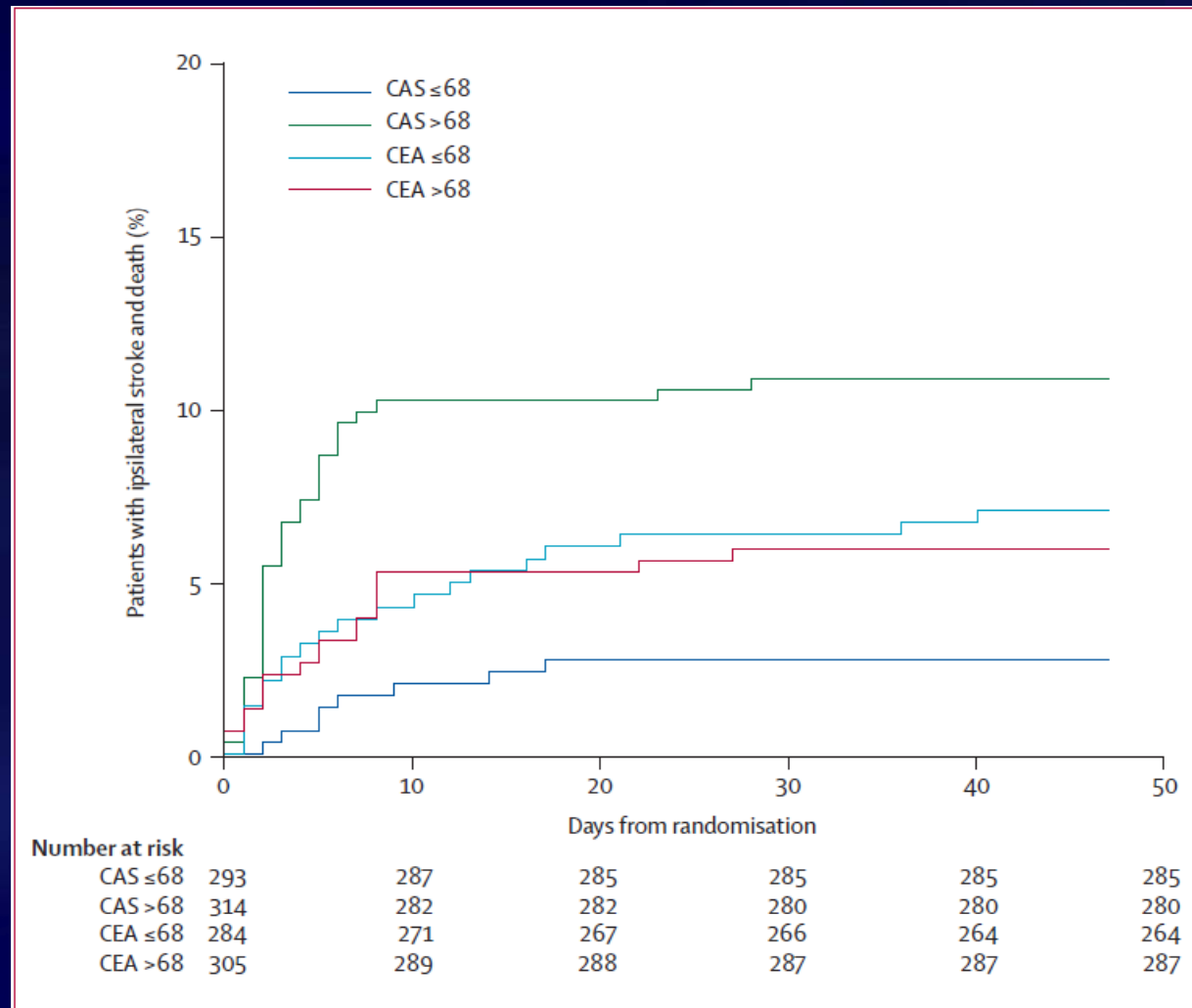
# Incidence of Stroke During CAS

## Cordis Carotid Stent Collaborative



# Incidence of Stroke During CAS

## The SPACE Trial





# Anatomic-Based Risk

- Difficult access to the common carotid artery:
  - Type III aortic arch +/- atherosclerotic disease
  - Common carotid artery disease
  - Common carotid artery tortuosity
  - Arm access
- Lesion site complexity:
  - Severe proximal or distal kinks
  - Heavy calcifications, particularly when combined with tortuous origin of ICA
  - Thrombus
  - “String” sign

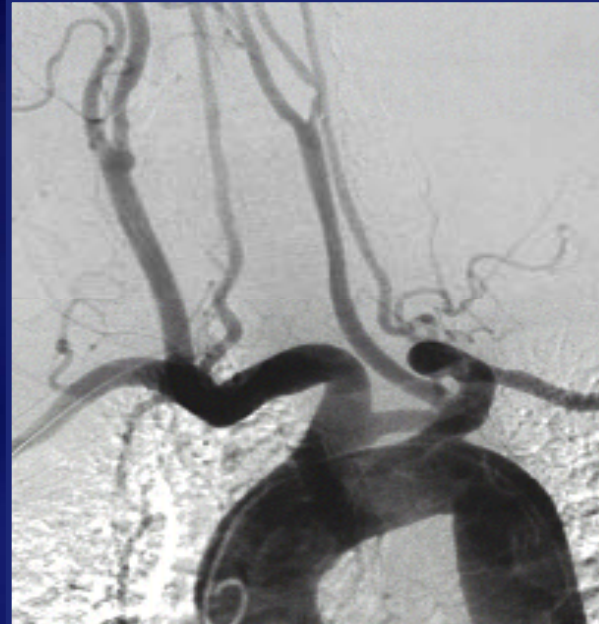
# Anatomic-Based Risk

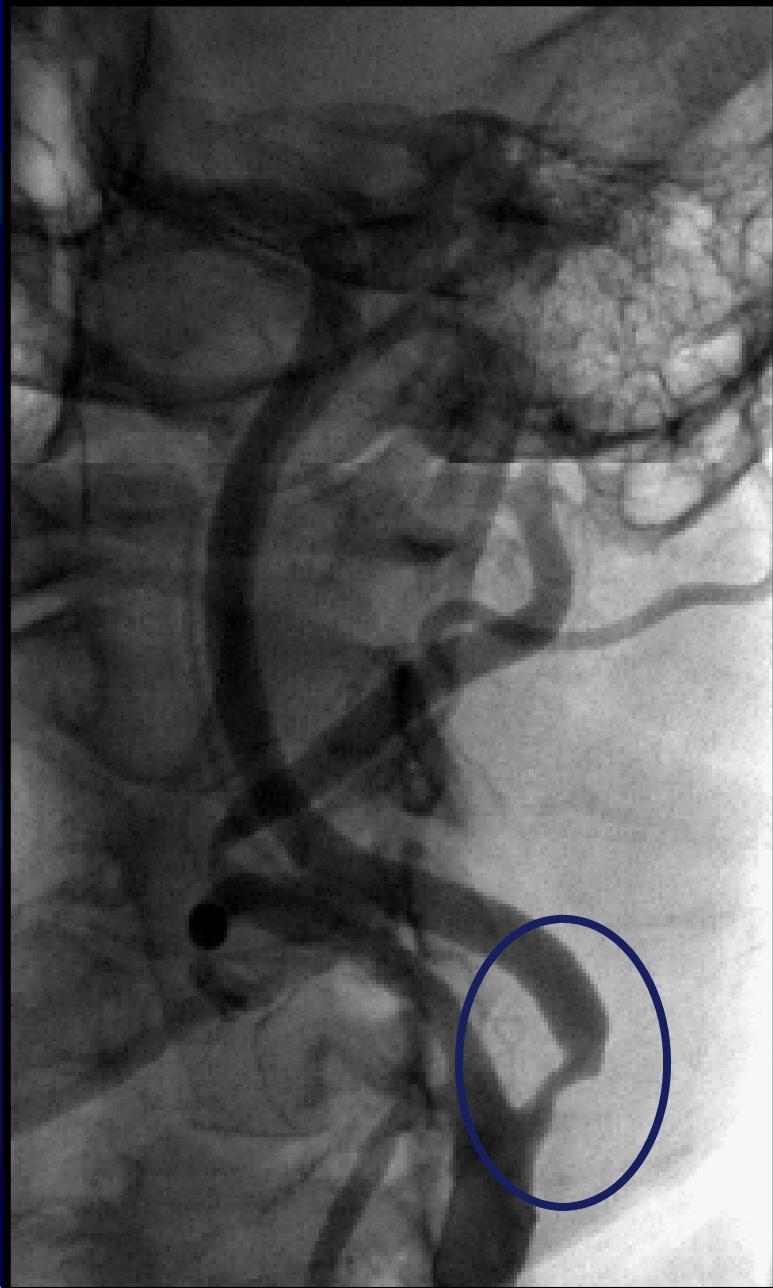
## Aortic Arch Complexity



# Anatomic-Based Risk

## Common Carotid Artery Disease & Tortuosity





# Who is at High Risk for CAS?

## Non Femoral Artery Access



- 74 yr. old asymptomatic patient.
- 90% RICA stenosis after CEA
- Aortic occlusion

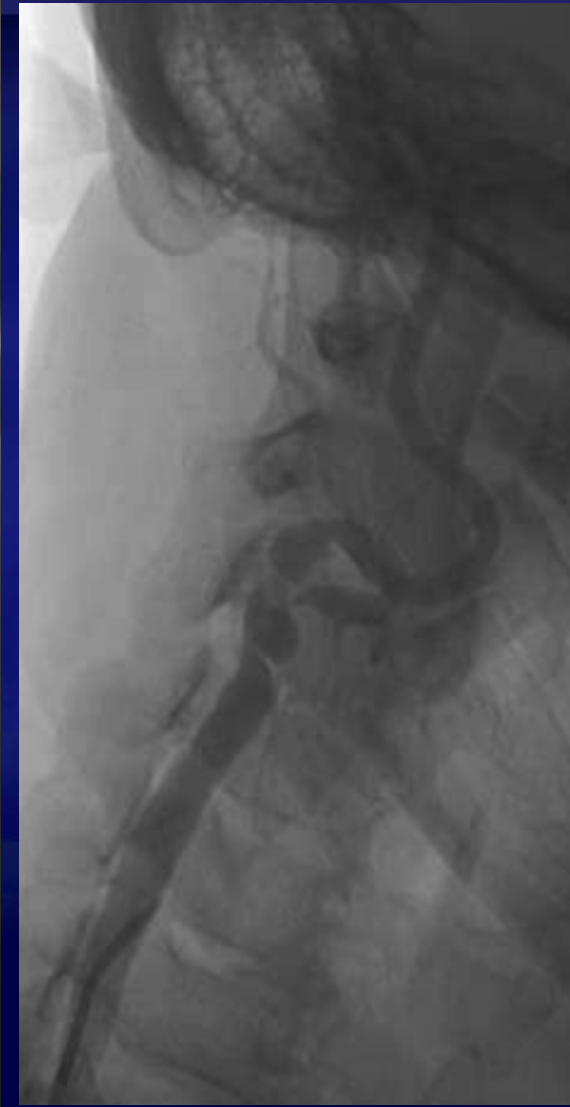


# Who is at High Risk for CAS?

## ICA kinks / CCA disease / ECA disease

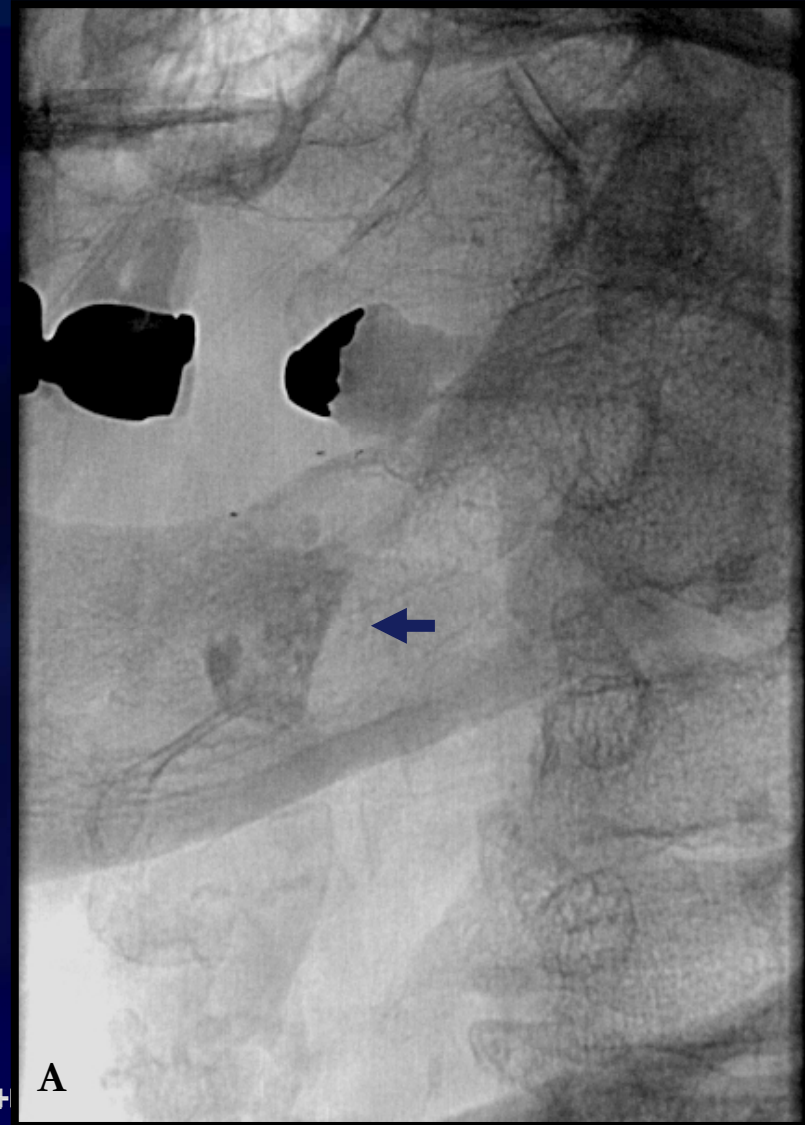
81 yr-old-male with unstable angina and left-sided TIA:

- 3 vessel CAD
- 80% RICA stenosis with involvement of the CCA and ECA
- Severe ICA tortuosity



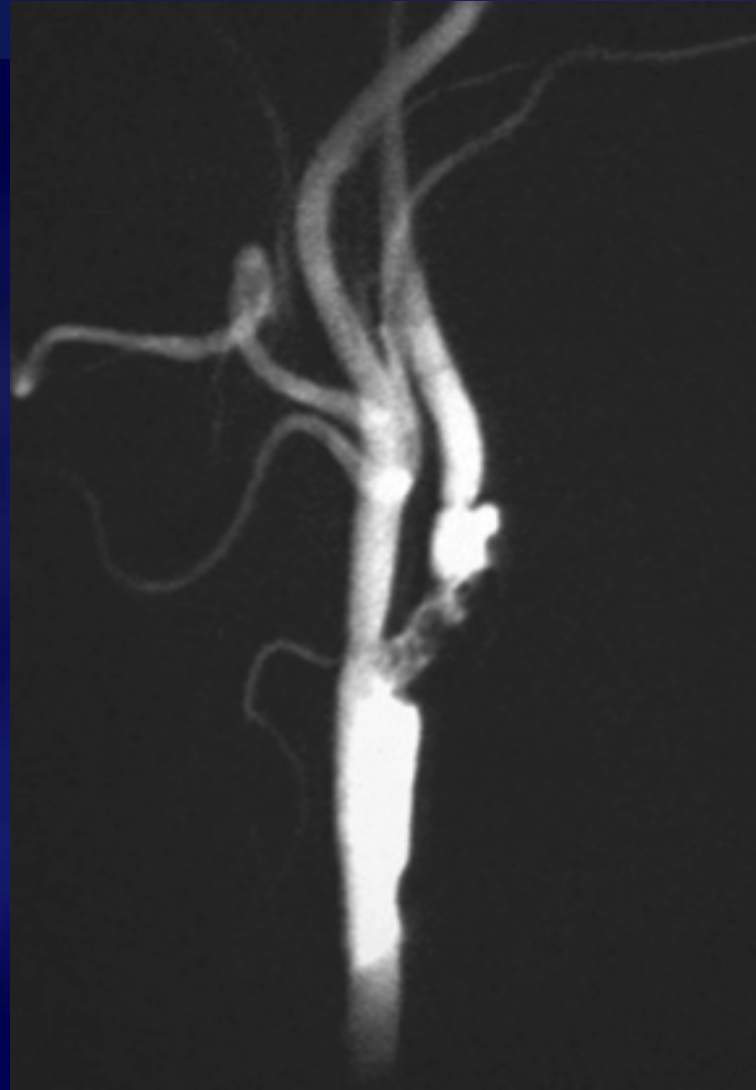
# Who is at High Risk for CAS?

## ICA Calcification / Tortousity



# Who is at High Risk for CAS?

## ICA Thrombus





# What Is the String Sign?



# Complications with CAS

## Role of the operator

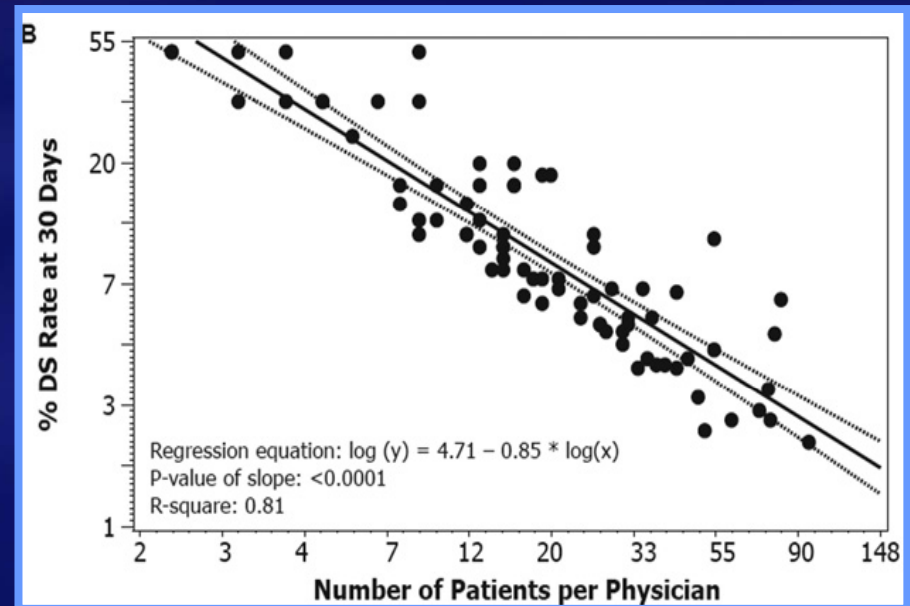
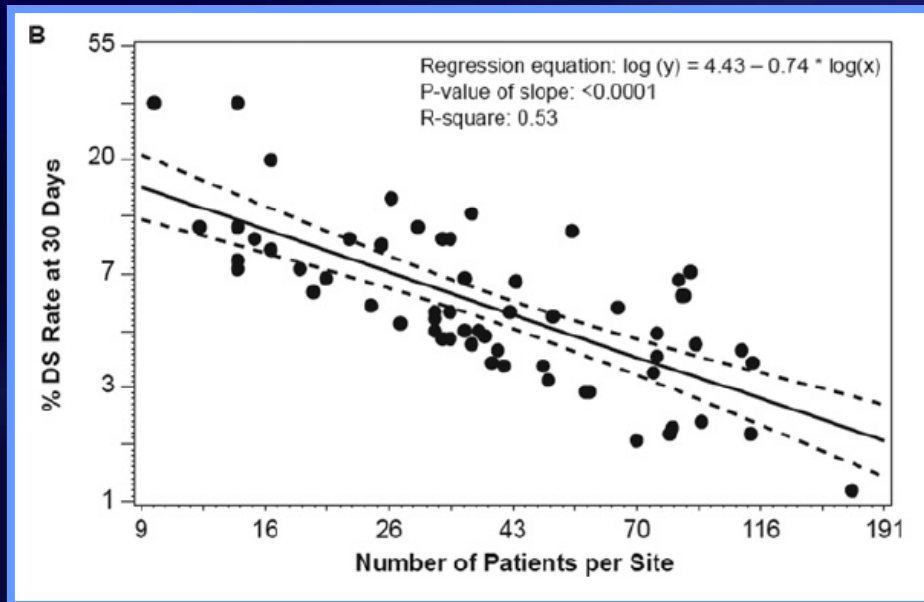


# Incidence of Stroke During CAS

## The CAPTURE II Registry

### Impact of Hospital and Operator Volume

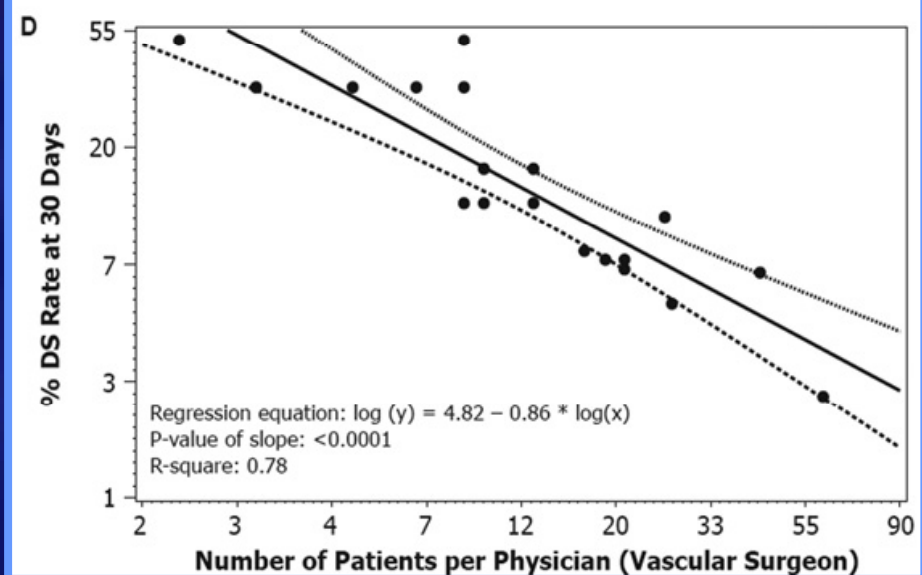
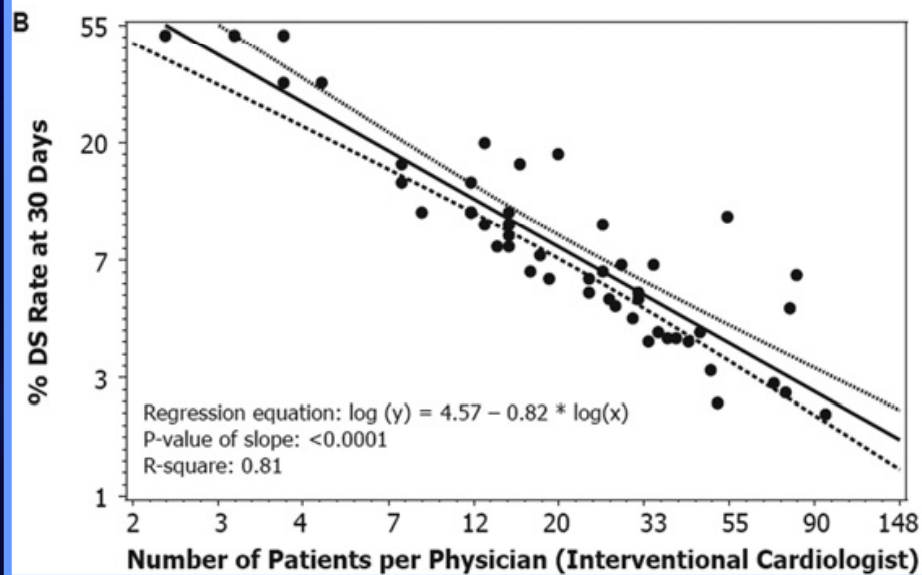
Nonoctogenarian asymptomatic patients



# Incidence of Stroke During CAS

## The CAPTURE II Registry

### Impact of Operator Specialty



# Complications with CAS

## Impact of Device Selection

### Stent design

The impact of open vs. closed cell design on outcome remains uncertain

### Type of EPD

Although there are definite differences in the technical performance of EPDs it is unlikely that there is difference in outcome

Proximal protection devices have the potential to enhance procedural safety in certain clinical and anatomic patient subsets

# Stroke Risk During CAS

## Summary

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