

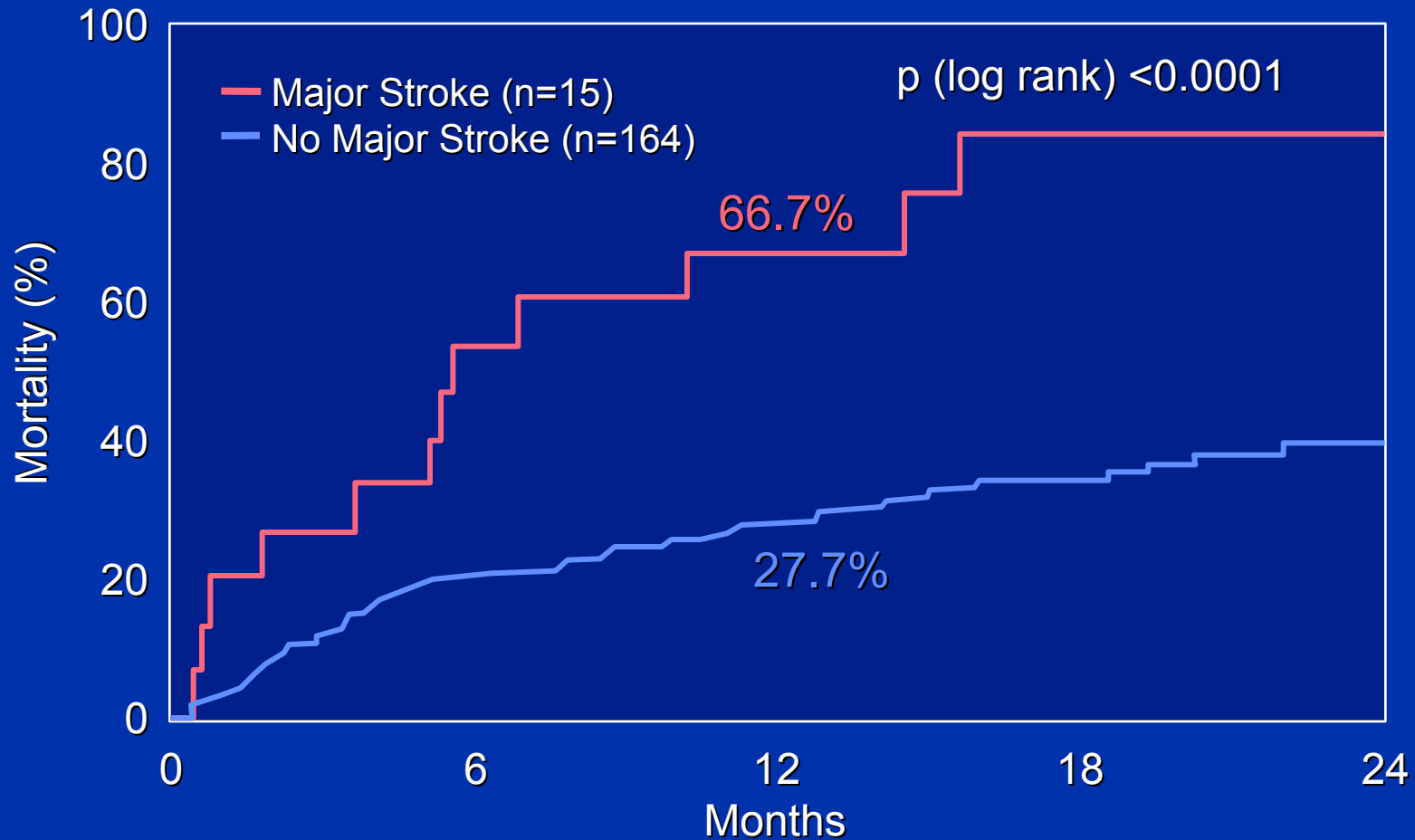
Will Cerebral Emboli Protection Devices Reduce Stroke After TAVR

E Murat Tuzcu, MD

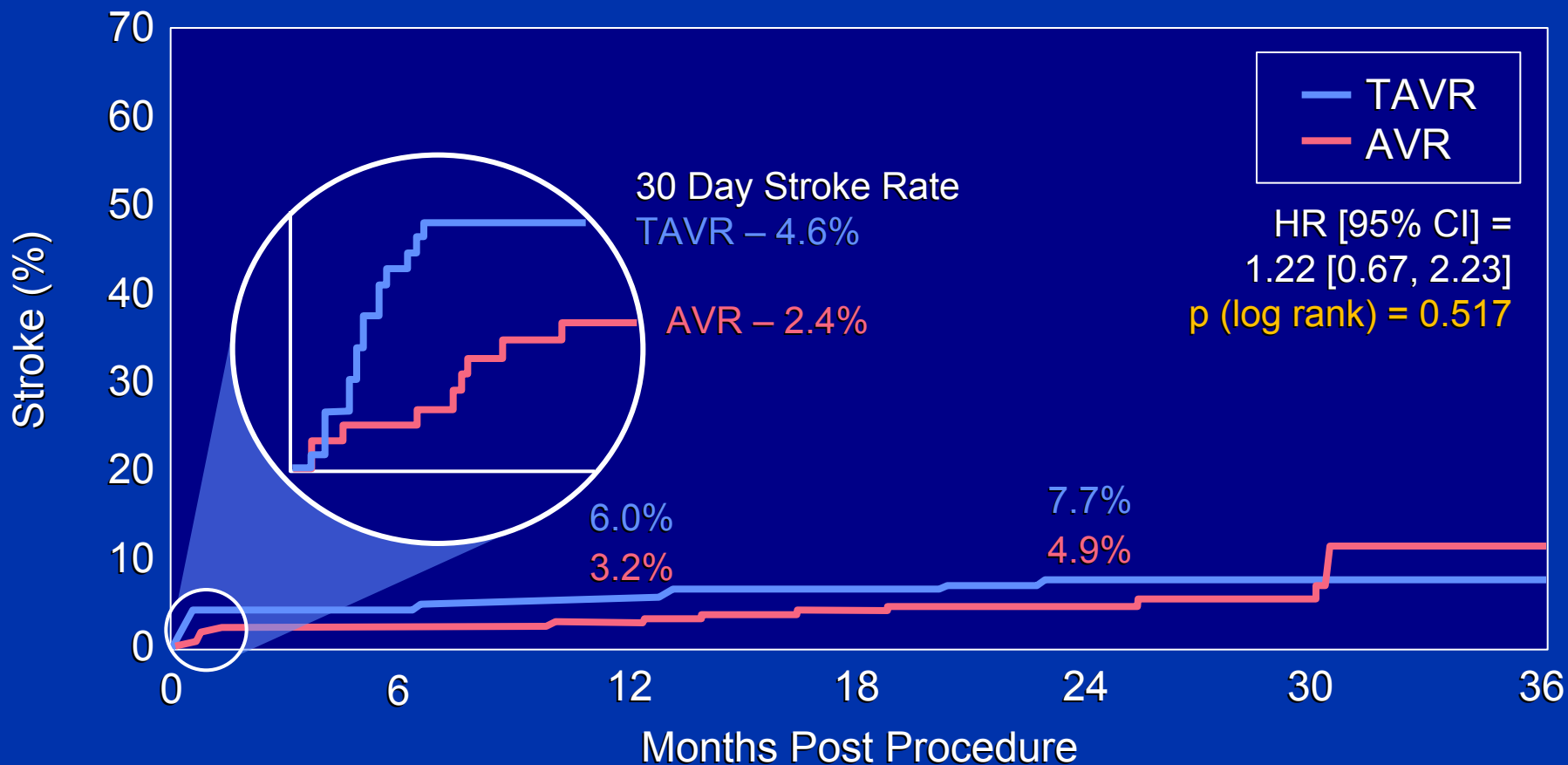
Cleveland Clinic

-
- Murat Tuzcu
 - No financial disclosures
 - Member of PARTNER Trial executive committee

PARTNER-B: Impact of Major Stroke on Survival



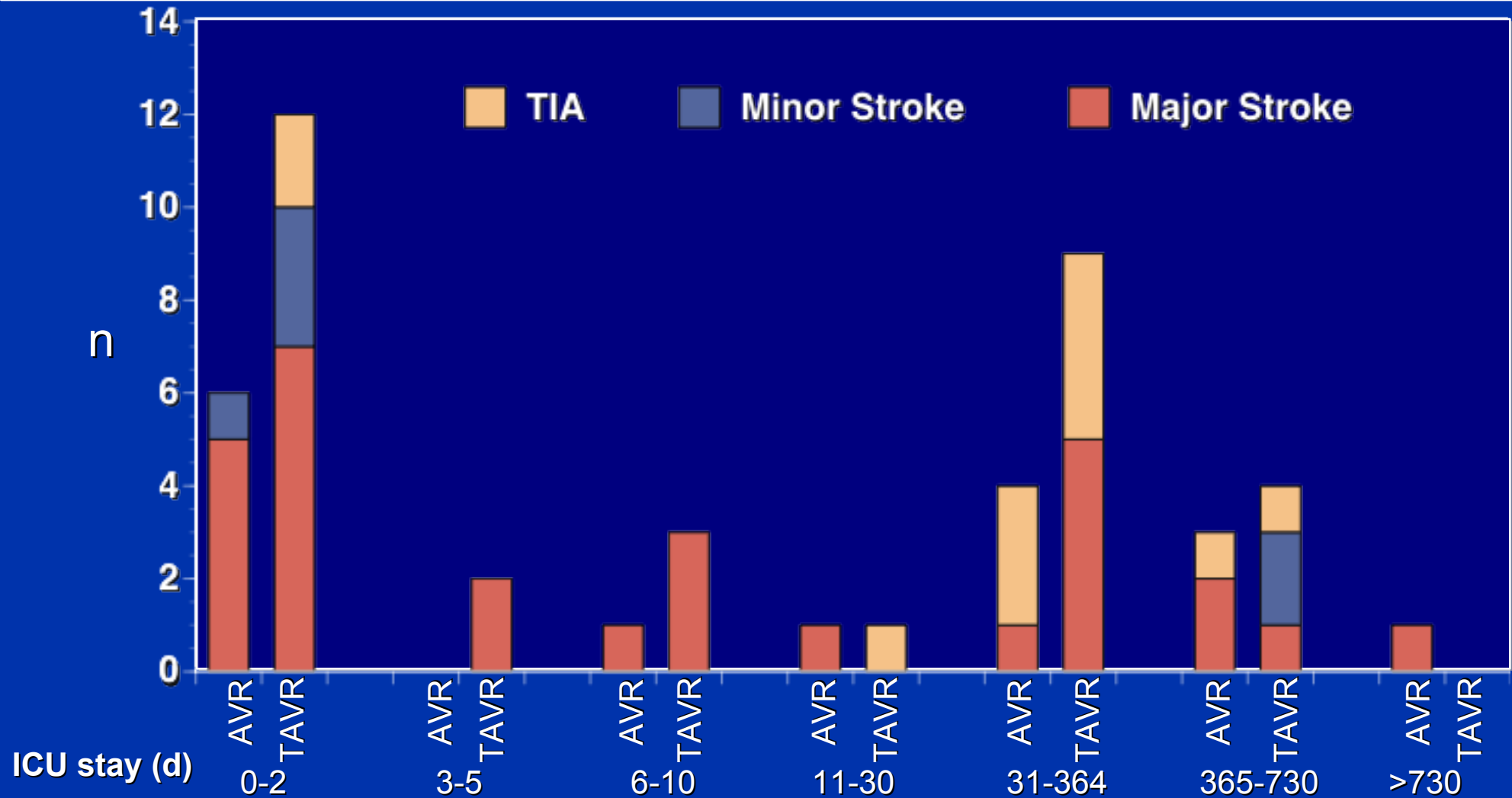
Stroke after TAVR and AVR



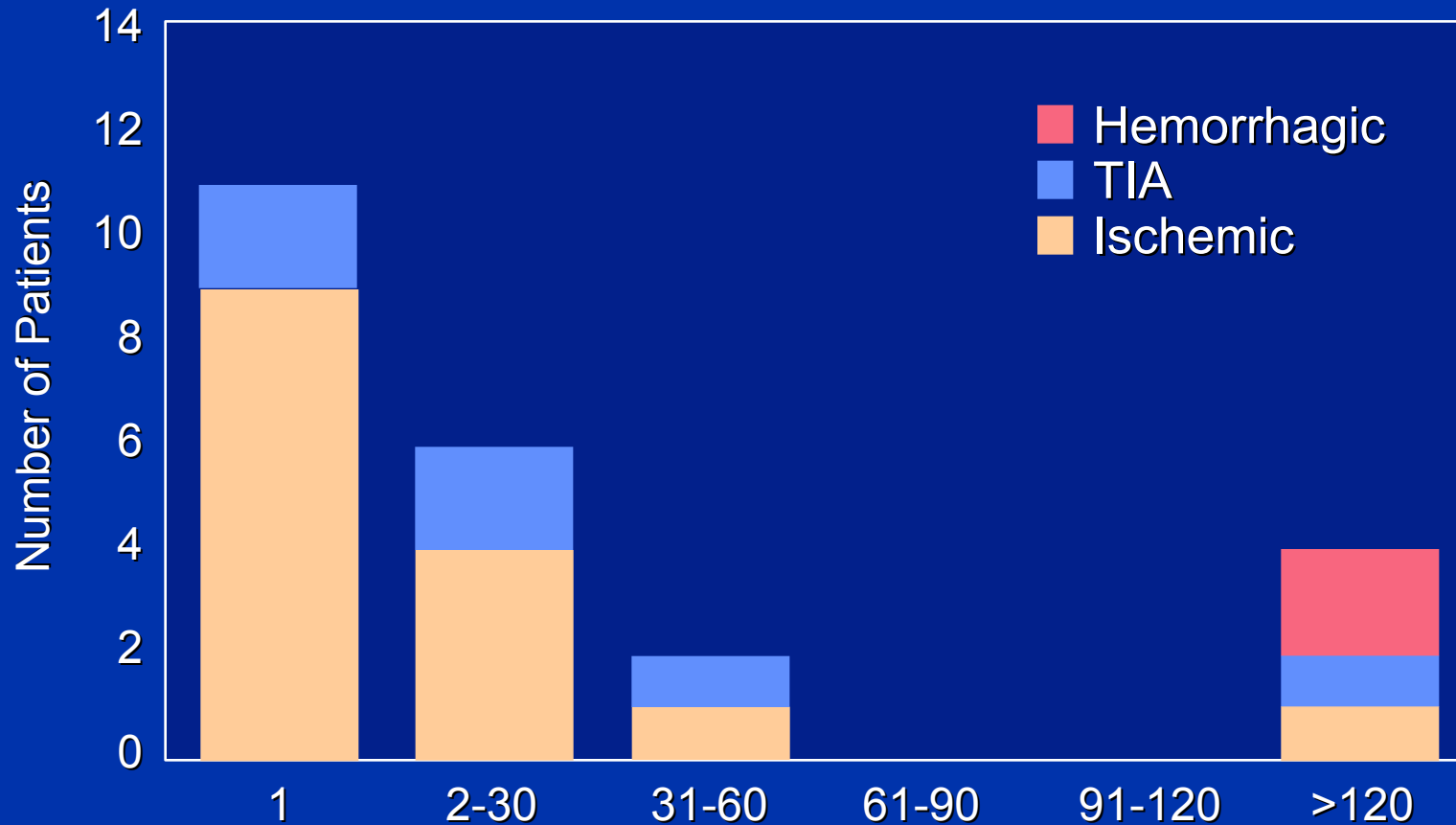
Numbers at Risk

TAVR	348	287	249	224	162	65	28
AVR	351	246	230	211	160	62	31

PARTNER-A: Timing of Neurological Events

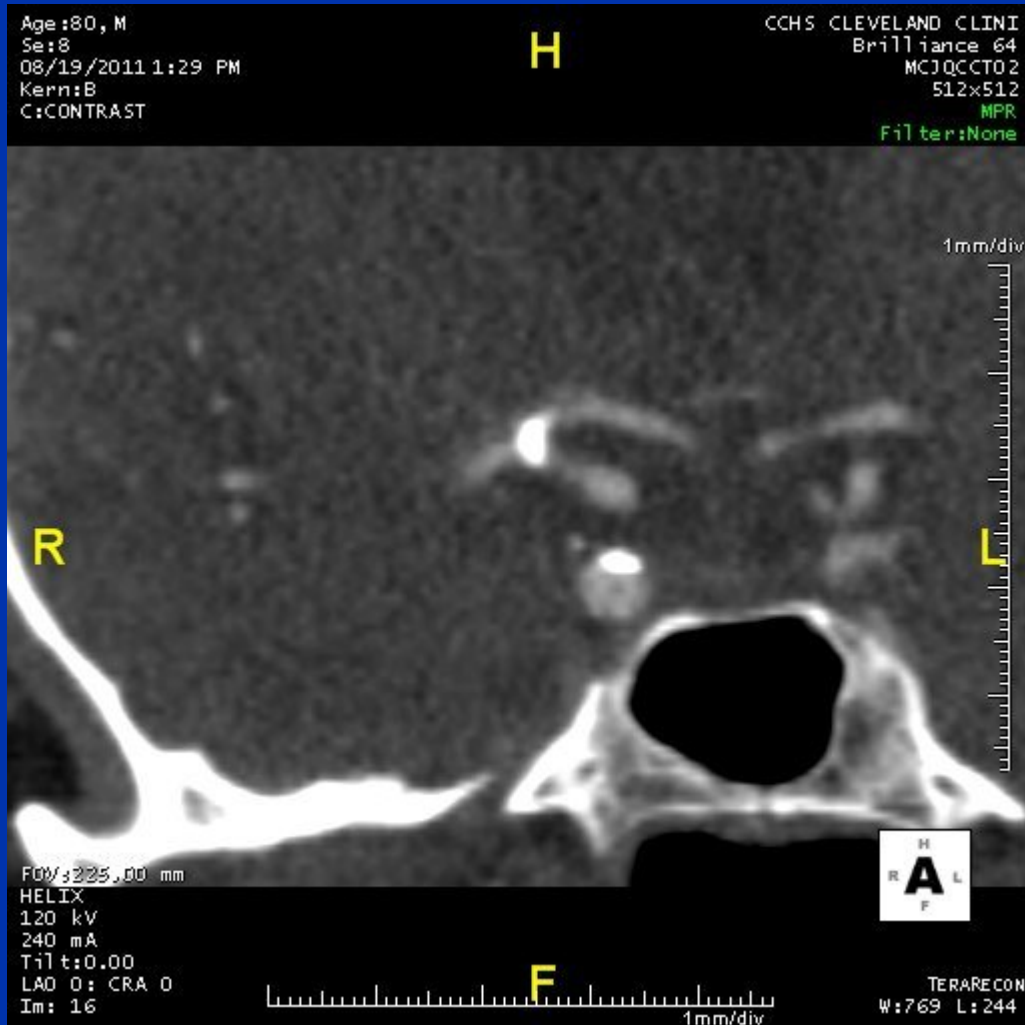


Timing of Neurological Event After TAVR

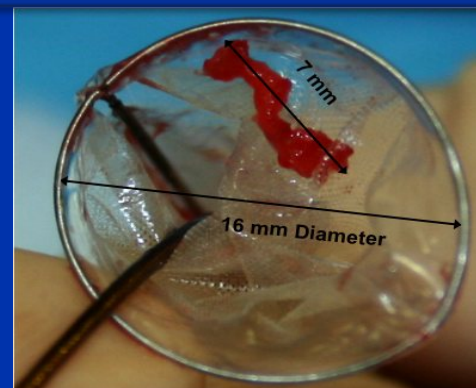
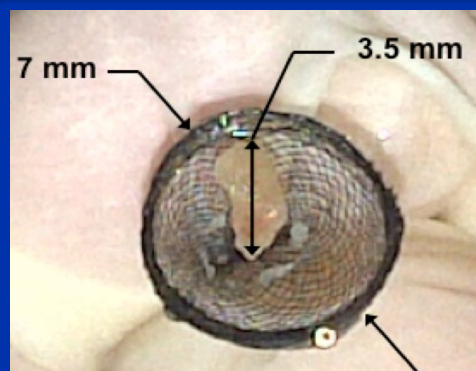
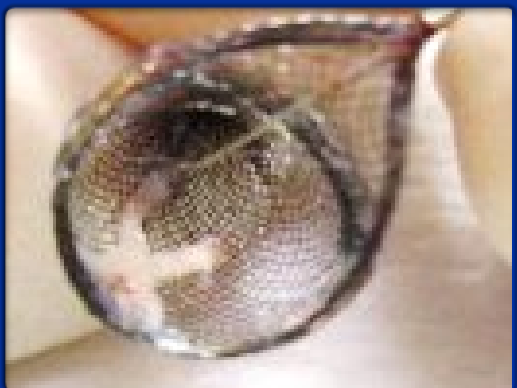
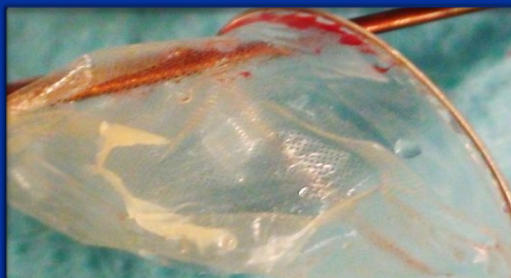


	1	2-30	31-60	61-90	91-120	>120
Lost to follow-up	0	0	4	4	5	10
Dead	6	23	28	32	36	45
Alive	247	230	221	217	212	198

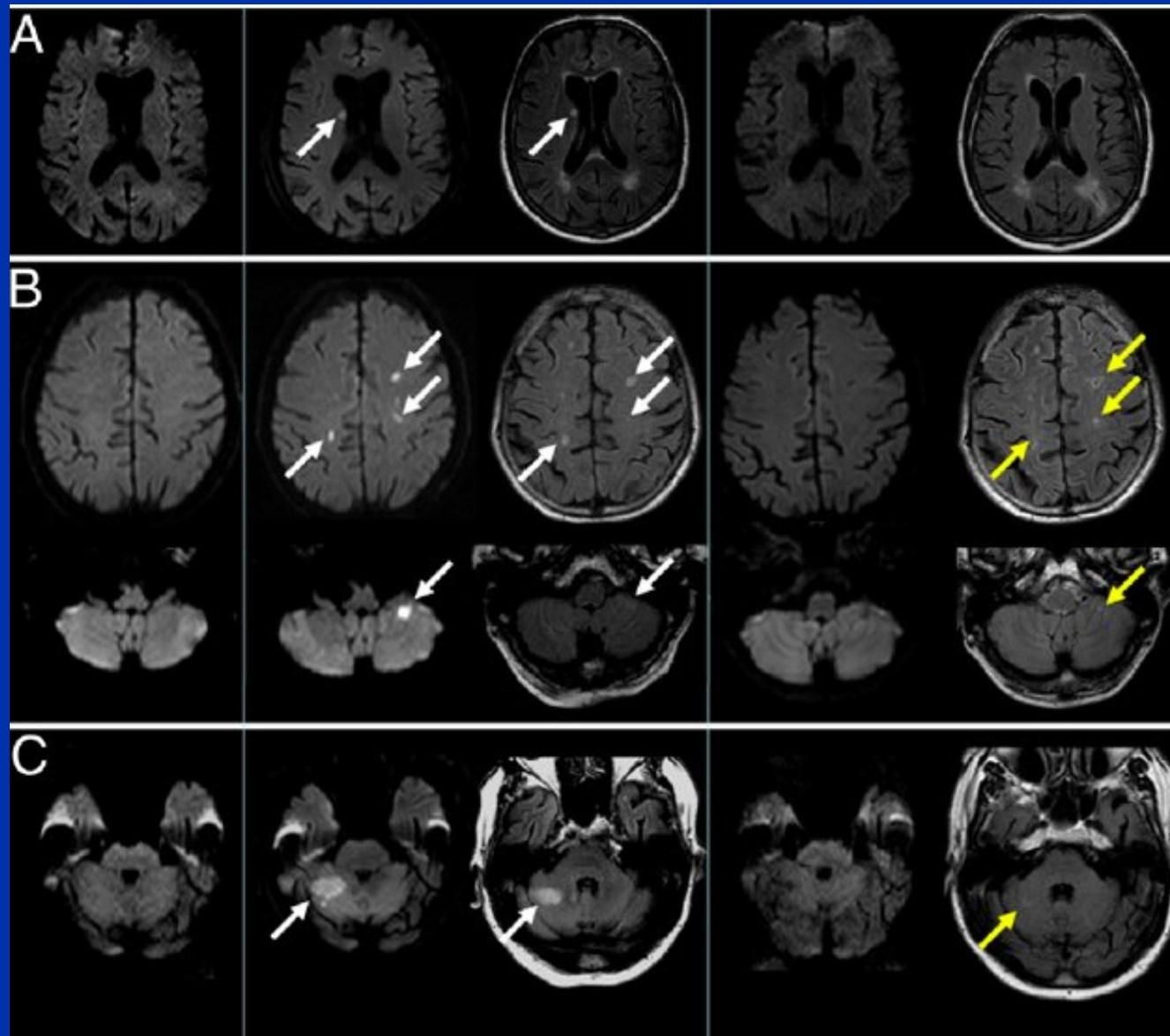
TAVR Related Cerebral Embolism



TAVR Related Captured Emboli



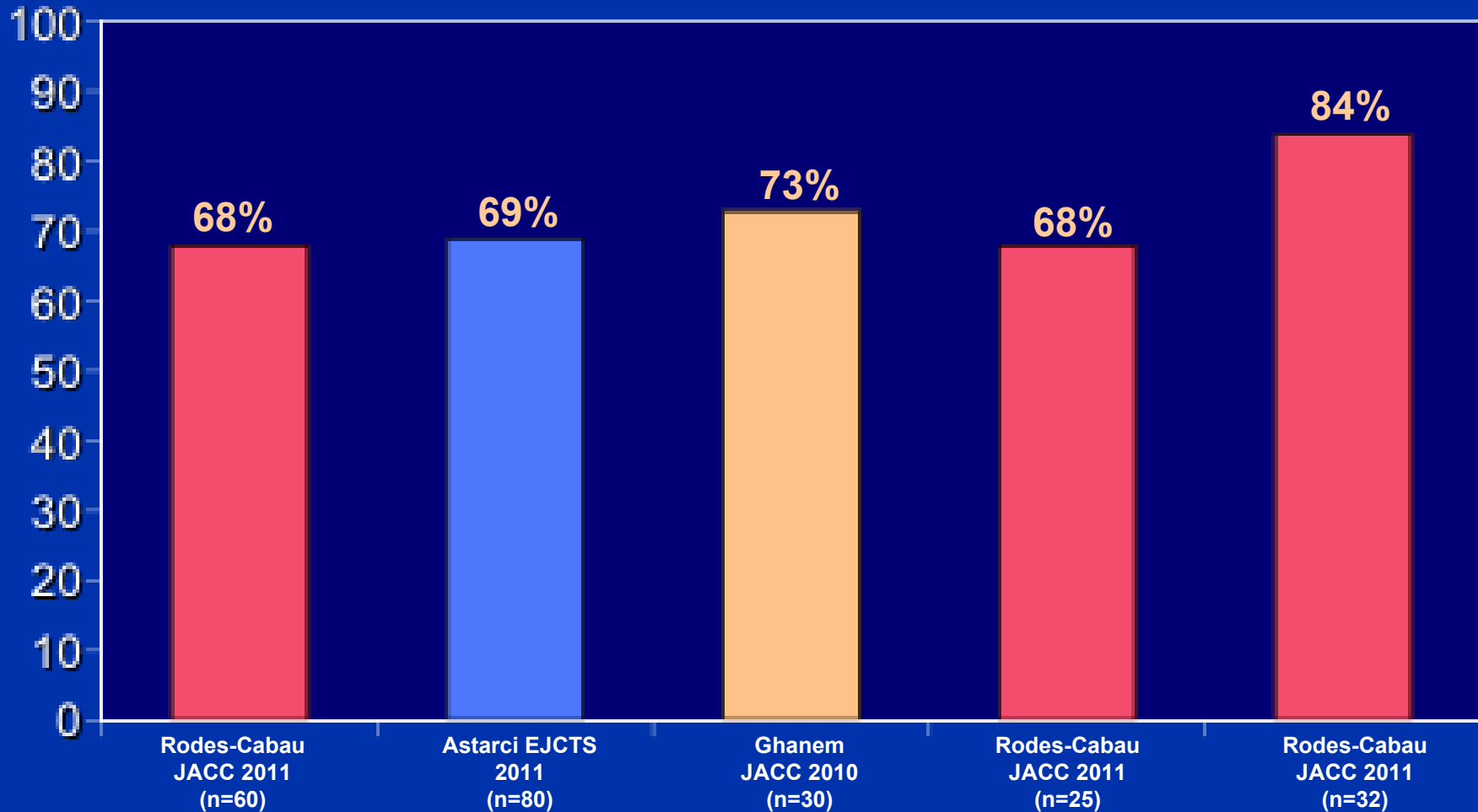
Silent Cerebral Embolism after TAVR



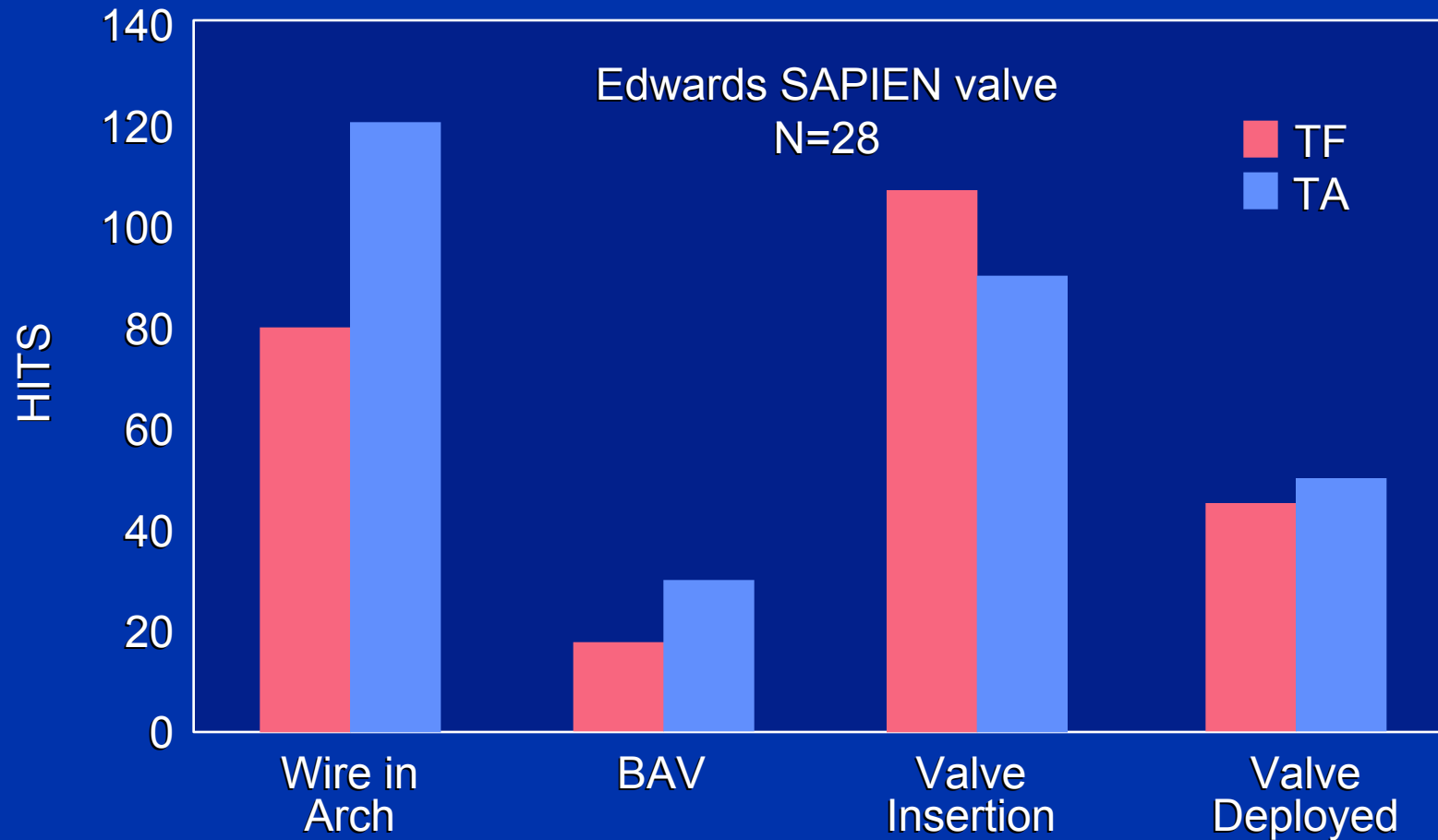
Silent Cerebral Embolism after TAVR

Diffusion Weighted MRI

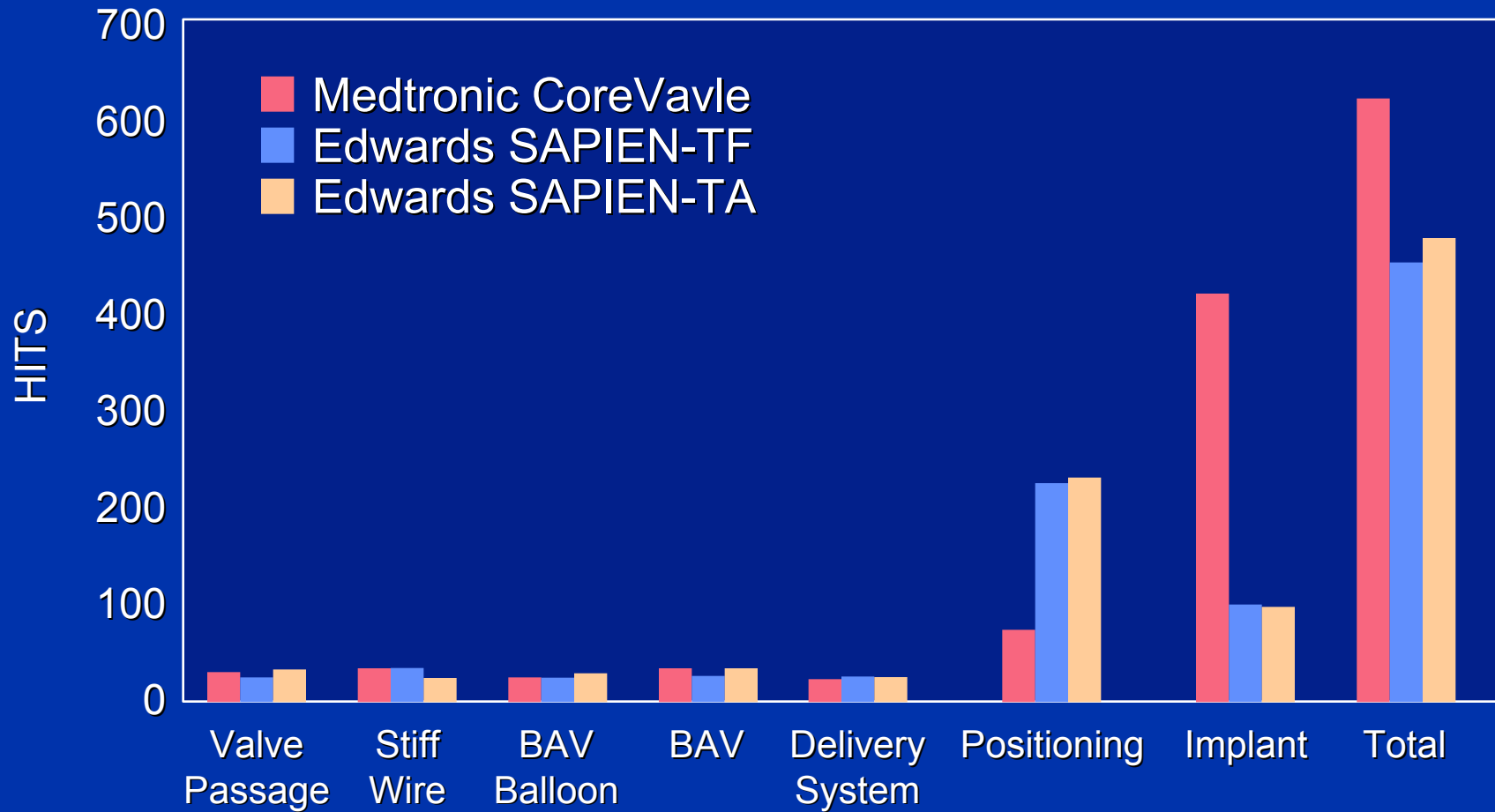
Percentage of Patients (%)



Timing of Emboli: TCD



Timing of Emboli: TCD



Sources of Embolism



Cerebral MRI Studies

Study	n	Valve type	Approach	Ischemic defects	Median number of lesions
Kahlert et al. <i>Circulation 2010</i>	32	ES (n=22) CV (n=10)	TF	ES: 86% CV: 80%	ES: 4 (2.1-6.0) CV: 2.6 (0.3-4.9)
Ghanem et al. <i>JACC 2010</i>	22	CV	TF	73%	2.5 (1.0-5.5)
Rodés-Cabau et al. <i>JACC 2011</i>	60	ES	TF (n=29) TA (n=31)	TF: 66% TA: 71%	TF: 3 (1-7) TA: 4 (2-9)
Fairbairn et al. <i>Heart 2011</i>	31	CV	TF	77%	2 (1-5)
Arnold et al. <i>JACC Int 2010</i>	25	ES	TA	68%	NA

ES : Edward Sapien

CV: CoreValve

Adapted from Josep Rodés-Cabau

MRI Findings - Cognitive/Neurological Status

Study	Cognitive/Neurological status	Results	Stroke
Kahlert et al. <i>Circulation 2010</i>	NIHSS, MMSE, mRS	No change	0%
Ghanem et al. <i>JACC 2010</i>	NIHSS	Neurological impairment: 3 (10%)	3.6%
Rodés-Cabau et al. <i>JACC 2011</i>	NIHSS, MMSE	No change	3.3%
Fairbairn et al. <i>Heart 2011</i>	NIHSS	No change	6.0%
Arnold et al. <i>JACC: Cardio Interv 2010</i>	Standardized clinical assessment	Neurological impairment: 5 (20%)	4.0%

Adapted from Josep Rodés-Cabau

Predictors of Defects

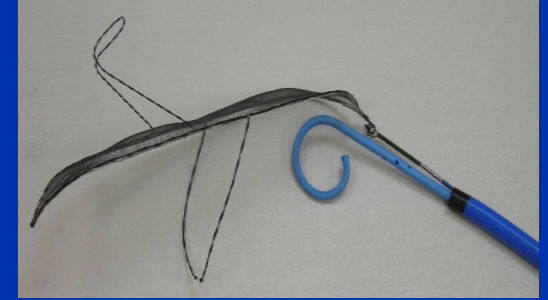
Study	Univariate	Multivariate
Kahlert et al. <i>Circulation 2010</i>	Hyperlipidemia Renal dysfunction Lower aortic atheroma thickness Porcelain aorta Increased left atrial appendage velocity Reduced aortic valve area	-
Ghanem et al. <i>JACC 2010</i>	Cerebrovascular disease Peripheral artery disease Aortic atheroma	-
Rodés-Cabau et al. <i>JACC 2011</i>	Male gender Coronary artery disease Higher transvalvular aortic gradient	-
Fairbairn et al. <i>Heart 2011</i>	Age Fluoroscopy time Catheterisation time Arch and descending aortic atheroma	Age, Aortic arch atheroma
Arnold et al. <i>JACC: Cardio Interv 2010</i>	-	-

Potential Variables Impacting of Stroke Risk

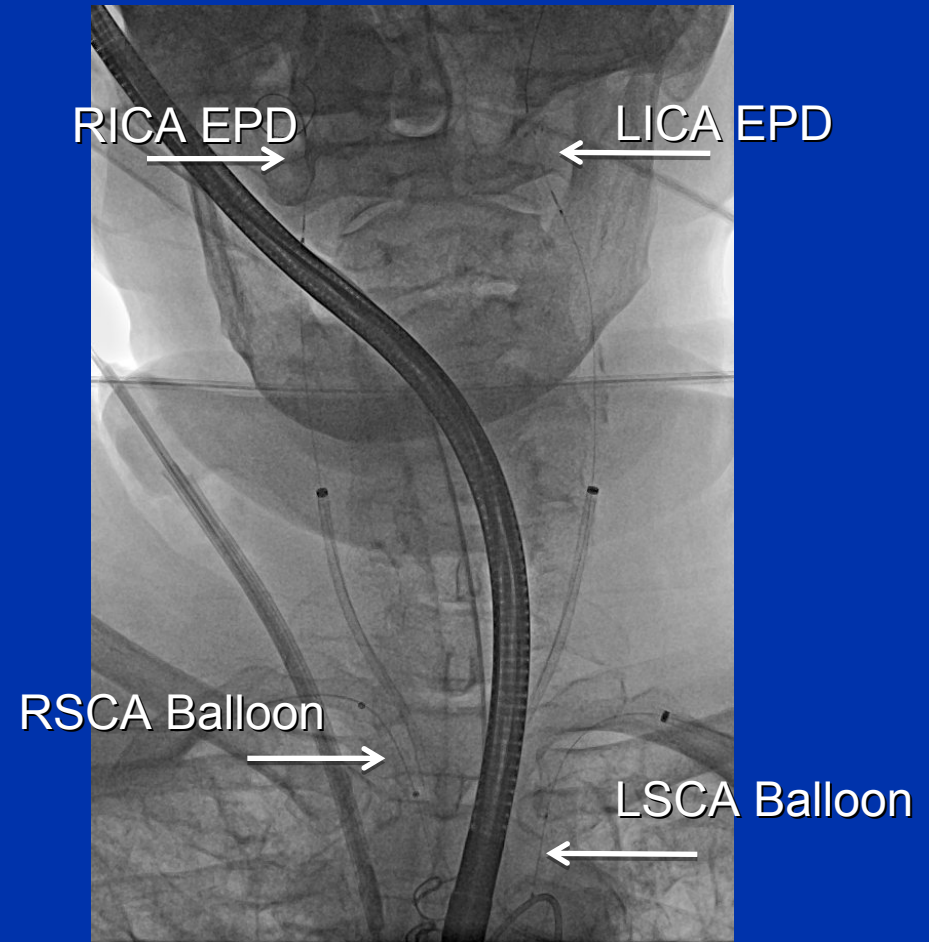
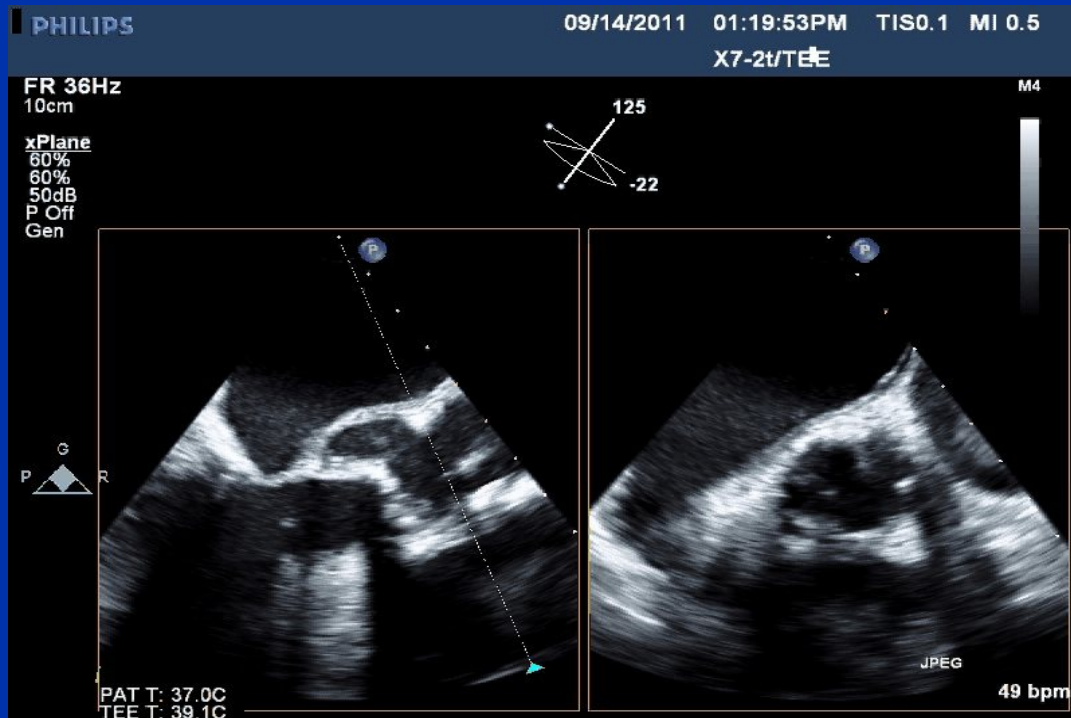
- **Patient variables**
 - Aortic atheroma
 - AF (old and new)
 - Carotid stenosis
- **Procedural variables**
 - Device manipulation in arch
 - Crossing the native valve
 - Deployment of the prosthesis
 - Postdilation of the valve
 - Access related (TA/TAo/subclavian/carotid)
- **Device related variables**
 - Stasis behind the valve
 - Stent or valve
 - Self expanding versus balloon expanding
- **Post procedural variables**
 - Antiplatelet therapy
 - Anticoagulation therapy
 - Use of protamine
 - Bridging of anticoagulation
- **Operator Experience**

Cerebral Protection Devices and Post TAVR Stroke

- There is clear evidence that embolization occur at the various stages of TAVR.
- Cerebral protection devices may very well prevent the emboli reaching the brain.
- However the risk associated with the use of these devices are unknown.
- The hypothesis “Cerebral emboli protection devices will reduce incidence of stroke after TAVR” should be tested in a RCT.



When We See it Coming – What do we do in US?



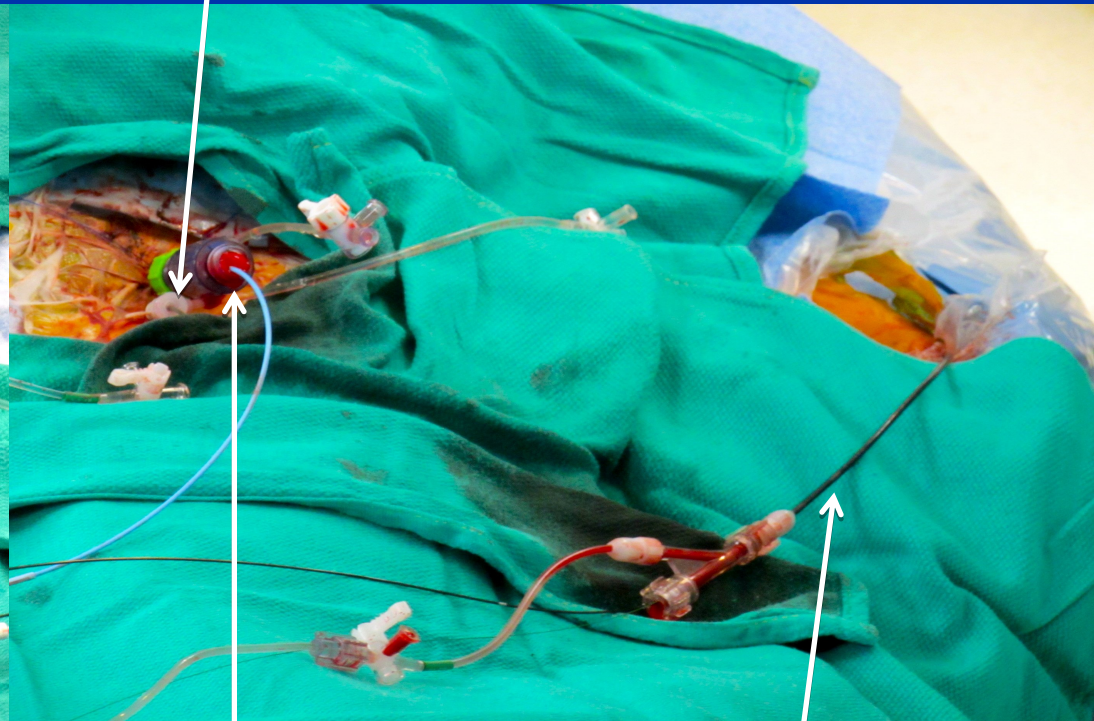
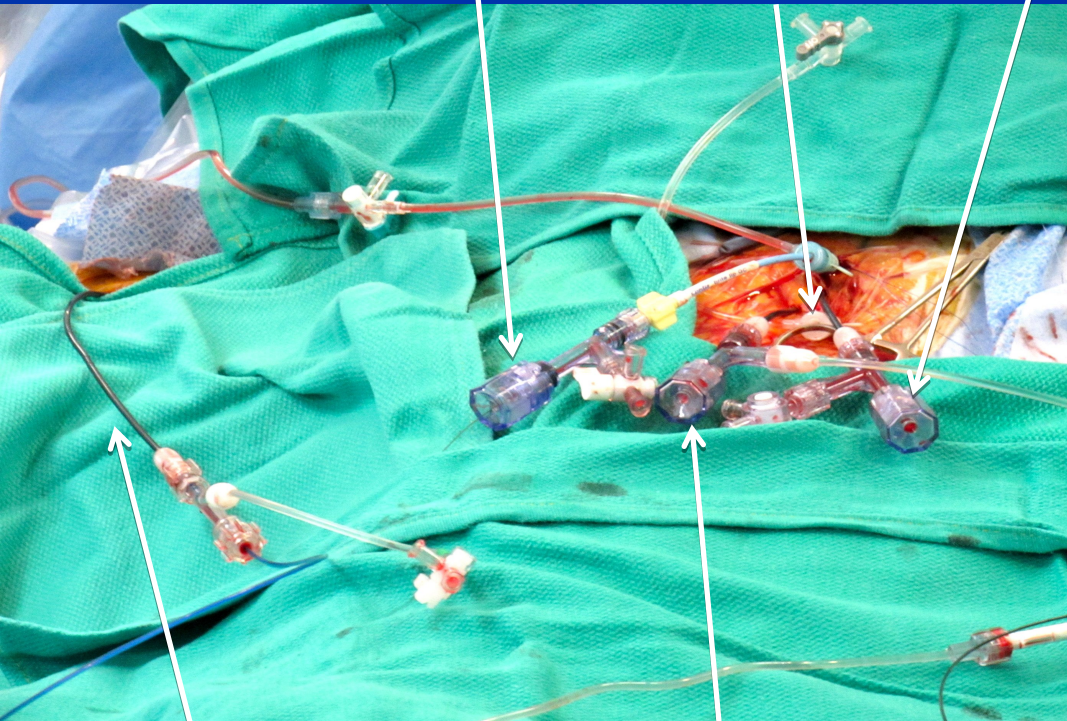
How to Accomplish This – Just Work Hard!

8F IMA Guide w
Crossover wire

6F/80 Shuttle
w LICA Filter

5F LFV sheath
w TPM

5F RFV sheath



6F/45 Shuttle
w RSCA balloon

6F/80 Shuttle
w RICA Filter

23F SAPIEN
Delivery sheath

6F/45 Shuttle
w LSCA balloon