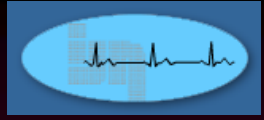


INSTITUT JANTUNG NEGARA
National Heart Institute



**Carotid Artery Stenting for
Asymptomatic & Symptomatic Patients:
How to Maximise Benefits & Reduce Risk?**

ROSLI Mohd Ali
Head
Department of Cardiology
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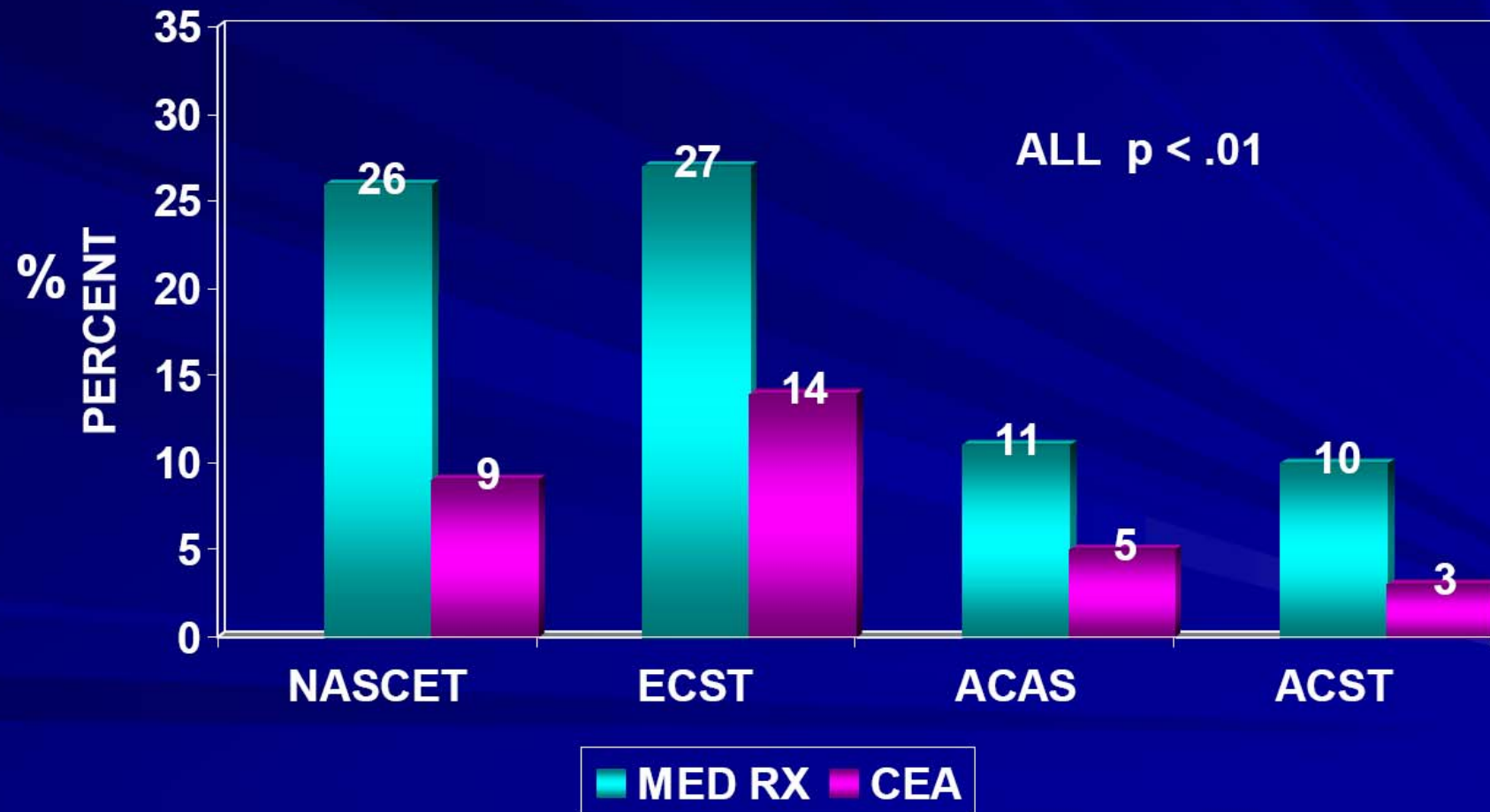


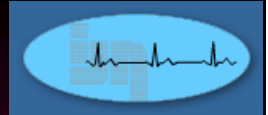
The Crux

1. Do It Safely & Effectively
2. Have a Low Complication Rate



CVA Incidence with CEA vs. Med Rx: Results of 4 Pivotal Trials





CAS vs CEA: Conflicting data

Favours CEA:

SPACE

Lancet 2006; 368: 1239 – 47. Abstract

EVA-3S

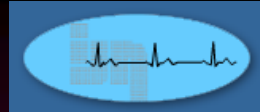
NEJM 2006; 355: 1660 – 71. Abstract

Non-Inferior to CEA

SAPPHIRE

NEJM 2004; 351: 1493 – 50. Abstract

(FDA approval for high grade symptomatic pt.
at high operative risk)

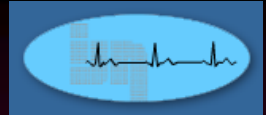


2005 Registry Data From 20% of Non-federal Hospitals in US

Outcome		CEA (%)	CAS (%)	p
<i>All Patients</i>	n -	122,000	11,700	
In-hosp. mortality		0.57	1.1	0.004
Post-op stroke		1.1	1.8	0.0004
<i>Asymptomatic</i>				
In-hosp. mortality		0.38	0.57	0.18
Post-op stroke		0.88	1.6	0.001
<i>Symptomatic</i>	n -	9,380	1,116	
In-hosp. mortality		1.4	4.6	0.0002
Post-op stroke		2.5	4.1	0.16

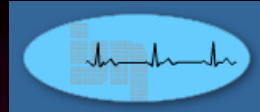
30 day Outcomes With CEA vs CAS

Society of Vascular Surgery Registry



Outcomes	CAS (%) n – 1450	CEA (%) n – 1368	p
Combined death, Stroke & MI	5.72	2.63	<0.001
Death	2.07	0.73	0.004
Stroke	3.52	1.68	0.003
MI	1.17	0.58	0.110
TIA	1.59	0.80	0.060

Sidawy AN J Vasc Surg 2009; 49: 71 – 79 Abstract

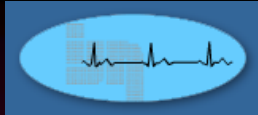


Issues & Challenges of CAS

1. Data favouring CEA
2. No of cases in Asia are not that many
More prevalent intracranial lesions ?

Experience leads to better procedural results

3. Neurologists & Physicians are gatekeepers
Skeptical about the benefits of CAS
4. Optimise medical therapy
- antiplatelet therapy, statins, anti-hypertensives



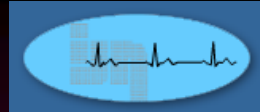
Issues in Carotid Intervention: Turf War

Vascular Surgeon

Interventional Radiologist

Cardiologist

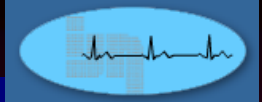




Carotid Artery Stenosis

Indications for Intervention :

Symptomatic	> 50% stenosis (pooled data from NASCET, ECST, VA)
Asymptomatic	> 70 % stenosis (> 60% in ACAS)



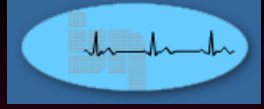
Indications for Carotid Revascularization

Indication	Symptomatic	Asymptomatic
Proven	70-99% Stenosis Complication Risk <6%	>60% Stenosis Complication Risk <3% Life Expectancy >5 yrs
Acceptable	50-69% Stenosis Complication Risk <3%	>60% Stenosis Complication Risk <3% Planned CABG
Unacceptable	<29% Stenosis Or Complication Risk >6%	<60% Stenosis Or Complication Risk >5%



AHA Maximum Acceptable Combined Peri-operative Neurological Morbidity & Mortality with CEA

Asymptomatic	3 %
Symptomatic – TIA	5 %
Symptomatic – CVA with recovery	7 %
Recurrent stenosis	10 %



Choose Your Patients Well

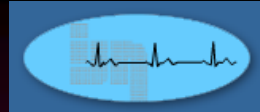
Team based approach is ideal
(cardiologist / interventional radiologist &
vascular surgeon)

High-risk Characteristics

	Anatomic Risk (n=643)	Physiological Risk (n=756)
CHF (class III/IV) and/or LVEF < 30%	--	24.8%
Open heart surgery within 6 weeks	--	1.5%
Recent MI (> 24 hours and < 4 weeks)	--	2.3%
Unstable angina (CCS class III/IV)	--	12.8%
Synchronous severe cardiac & carotid disease req heart surgery & carotid revascularization	--	8.9%
Severe pulmonary disease	--	14.6%
Abnormal stress test	--	16.1%
Age ≥ 80 years as a single risk factor	--	42.5%
Contralateral carotid occlusion	26.0%	--
Contralateral laryngeal palsy	4.2%	--
Post radiation treatment	17.4%	--
Previous CEA recurrent stenosis	53.8%	--
High cervical ICA or CCA lesions below the clavicle	14.6%	--
Severe tandem lesions	4.0%	--

Pooled analysis: SAPPHIRE randomized and registry stent arms and CASES-PMS

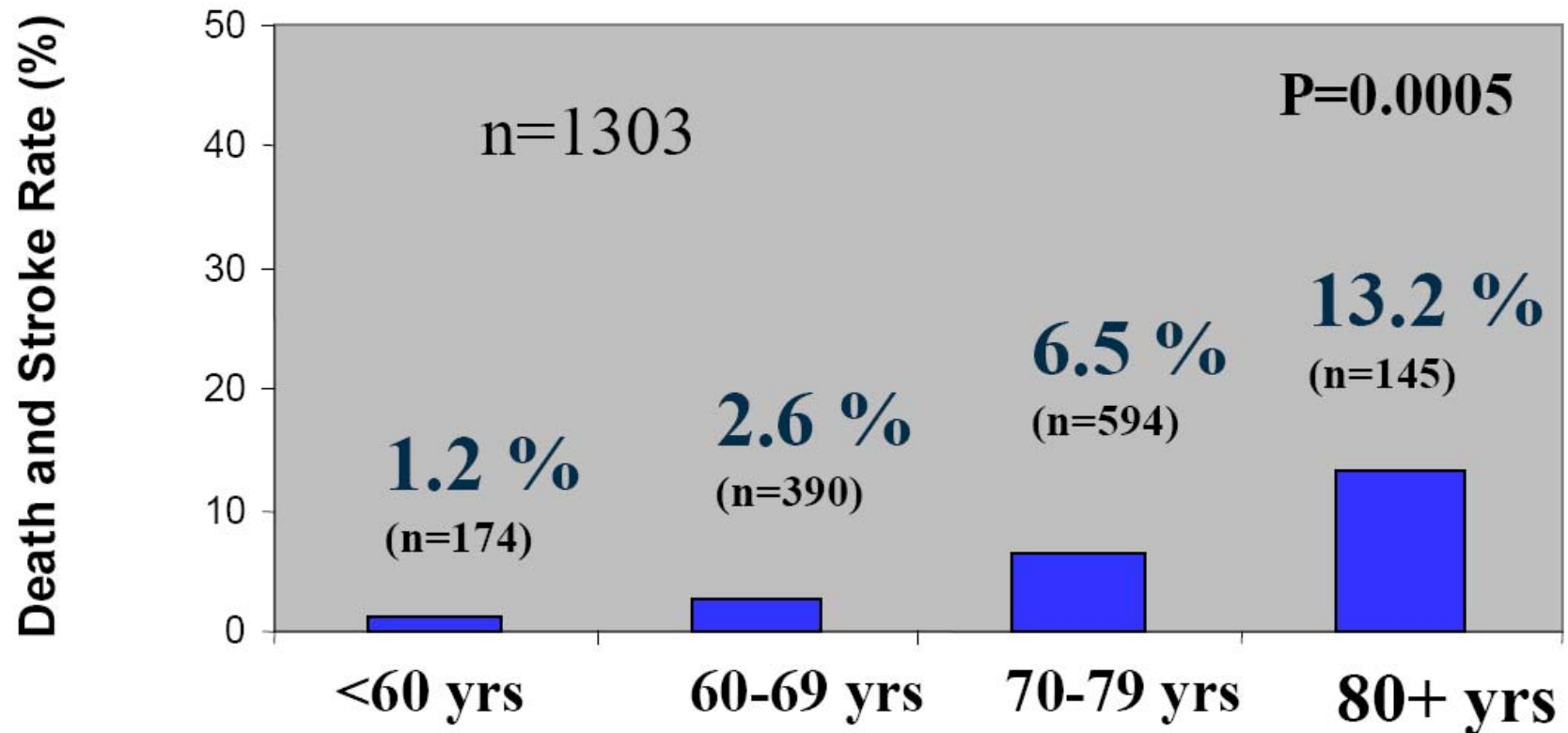
Patient Selection

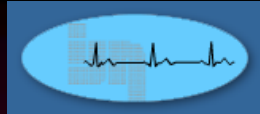


- Age

CREST Lead-In Data

Death and Stroke Rate By Age Group at 30 days





Straight forward lesions





Difficult lesions

Type III Arch



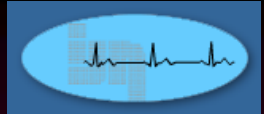


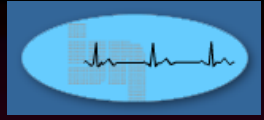
Patient Selection

- Anatomic difficulties
 - complex lesions
 - & tortuous ICA



Rt ICA Stenosis & Lt. ICA occlusion





Reducing Risks

Patient selection

Recognise complications &
know ways to overcome them

hypotension & bradycardia
slow flow

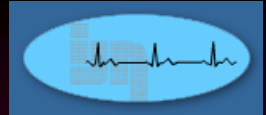
dissection

full basket

vasospasm

stroke

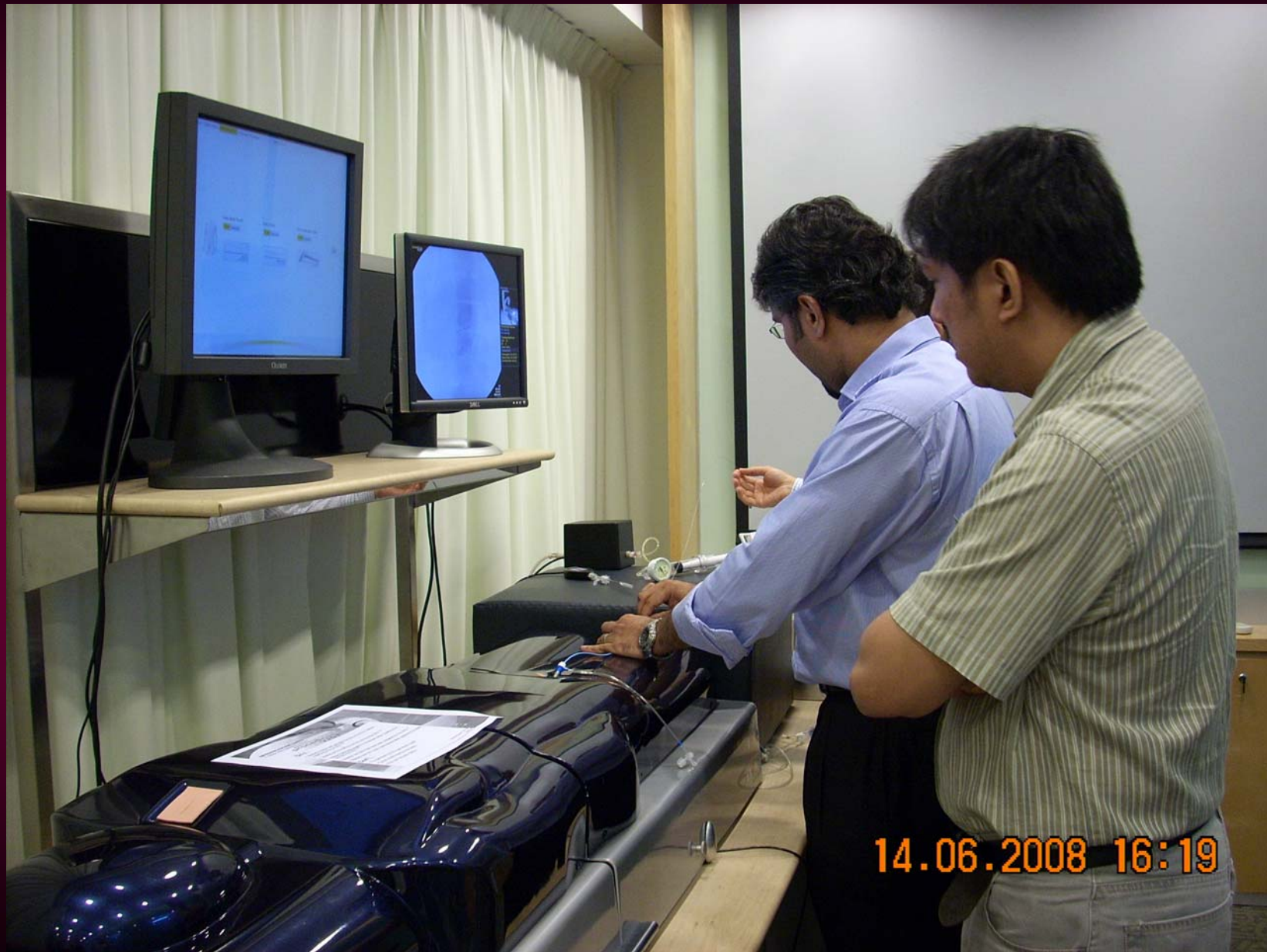
hyperperfusion syndrome



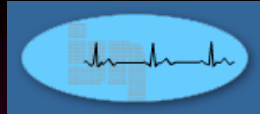
Adequate Training

1. Proctoring
2. Attending courses / conferences
3. Structured Simulator Training Course

Simulator Training



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Simulator Training



CAROTID INTERVENTIONAL COURSE
15 & 16 NOVEMBER 2008



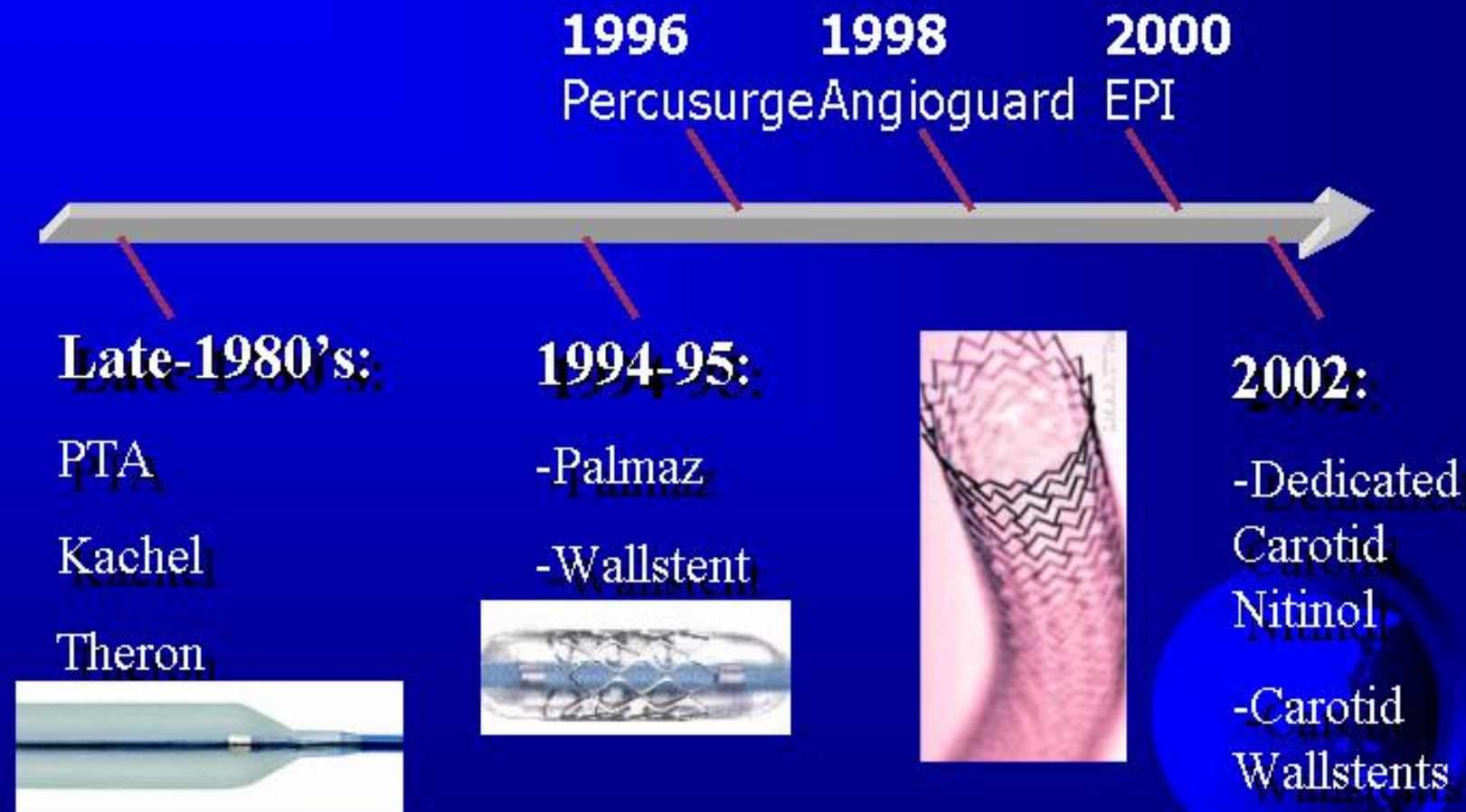
Simulator Training

Simulator Program for 2008

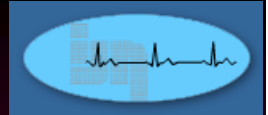
	Events	Participants
Carotid	2	7
Renal	4	27
Lower Limb	3	26
Basic Cardiology	5	35
Bifurcation PCI	1	6
Train The Trainers	1	5



History of Carotid Stenting



Courtesy of Wholey



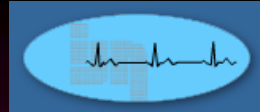
Further Data Required

Carotid Revascularisation Endarterectomy vs Stenting Trial (CREST) – NIH sponsored

2511 pt – asymptomatic & symptomatic
not at high risk for surgery

International Carotid Stenting Study (ICSS)

1700 pt – asymptomatic
head to head comparison CAS vs CEA



Summary

Improving awareness amongst the public & health care providers

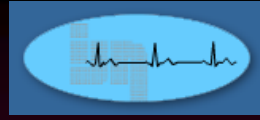
Convincing the gatekeepers (neurologists)

Avoid a Turf War

Keep a registry

Await CREST & ICSS

– help to ascertain position & niche of CAS



Summary

- Choose your patients properly
- Optimise medical therapy
- Perform the procedure safely

Ensure you have the proper equipment

Plan your strategy

Avoid excessive manipulation in arch & great vessels

Recognize and treat complications

Make it Simple!!