



XIV Jornadas SOLACI **5º Región Cono Sur**

INTERVENCIONISMO EN EL SIGLO XXI NUEVAS FRONTERAS

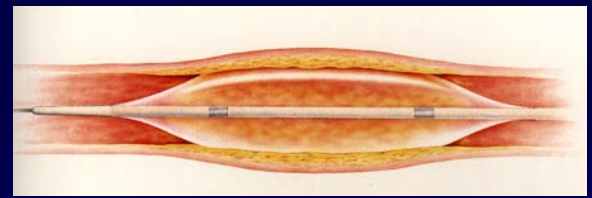


HOSPITAL ITALIANO
de Buenos Aires

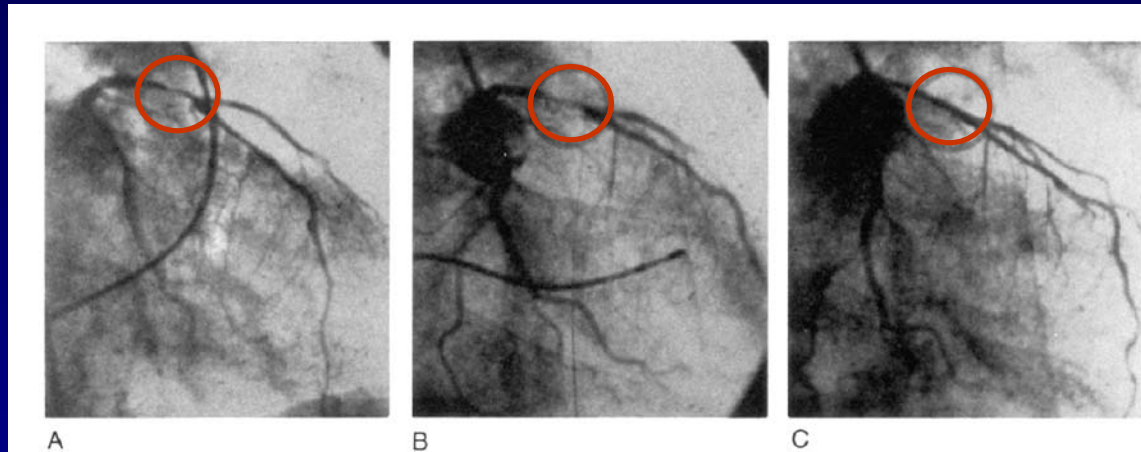
*Instituto de Medicina
Cardiovascular*

Daniel Berrocal, MD, FACC
Jefe de Cardiología Intervencionista
daniel.berrocal@hiba.org.ar

Andreas Gruentzig September 1977

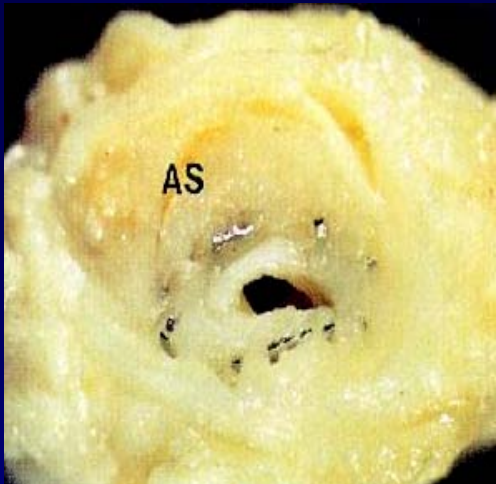


Balloon angioplasty

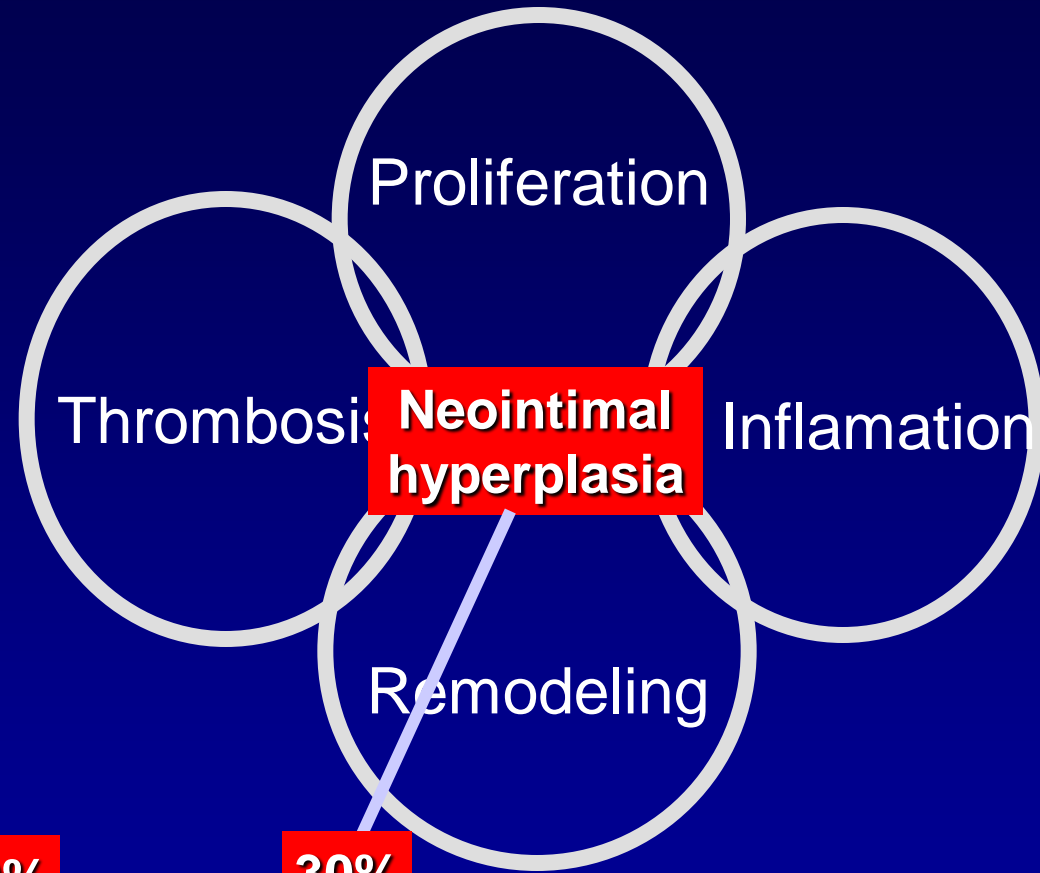
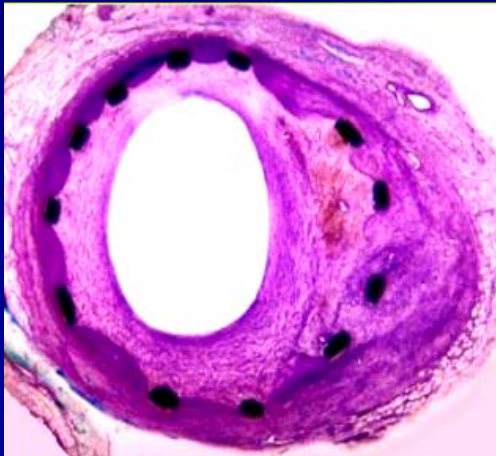


Roads opened by “insane”
will be later traveled by the “wise man”
C. Dossi

Response to vascular injury



Elastic recoil



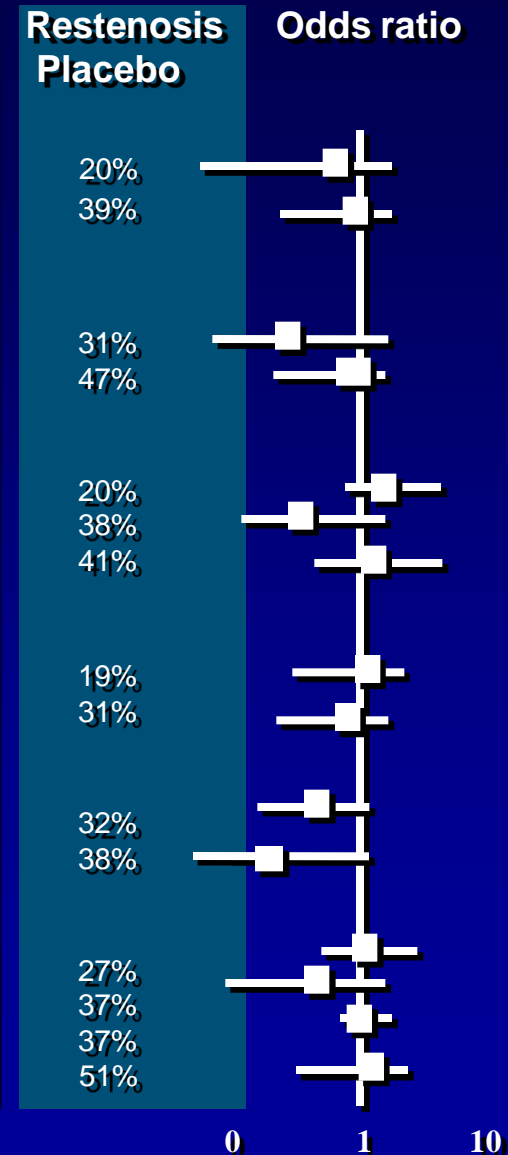
70%

30%

RESTENOSIS

Clinical Trials evaluating Antithrombotic and anticoagulants

Trial	year	N°	Control Angio	Drug(s) /dose	Stenosis definition	Restenosis Drug	Restenosis Placebo	Odds ratio
ASA vs. Placebo								
White	1987	157	71%	AAS 990mg/DIP 225mg	≥ 70%	18%	20%	
Schwartz	1988	376	66%	AAS 990mg/DIP 225mg	≥ 50%	38%	39%	
ASA high vs low dosis								
Dyckmans	1988	203	42%	AAS 1500mg vs 320mg	≥ 50%	21%	31%	
Mufson	1988	453	37%	AAS 1500mg vs 80mg	≥ 50%	51%	47%	
Ticlopidin								
White	1987	157	76%	Ticlopidina 750mg	≥ 70%	29%	20%	
Kitazume	1988	189	100%	Ticlopidina 200mg	≥ 50%	27%	38%	
Bertrand	1990	266	92%	Ticlopidina 200mg	50% lost	50%	41%	
Tromboxan A₂ blocker								
Serruys	1991	649	89%	GR 32191 80mg	≥ 0.72mm lost	21%	19%	
Feldman	1992	1192	59%	GR 32191 40-80mg	≥ 70%	28%	31%	
Prostacilin and analogous vs Placebo								
Knudston	1990	270	83%	Prostaciclina 5ng/kg/min	≥ 50%	27%	32%	
Raizner	1993	247	85%	Ciprostene 120ng/Kg/min	≥ 50%	26%	38%	
Anticoagulants								
Thornton	1984	248	72%	Warfarina	50% lost	36%	27%	
Urban	1988	110	77%	Warfarina	≥ 50%	29%	37%	
Ellis	1989	416	61%	Heparina	≥ 50%	41%	37%	
Faxon	1994	394	86%	Enoxaparina 40mg	≥ 50%	52%	51%	

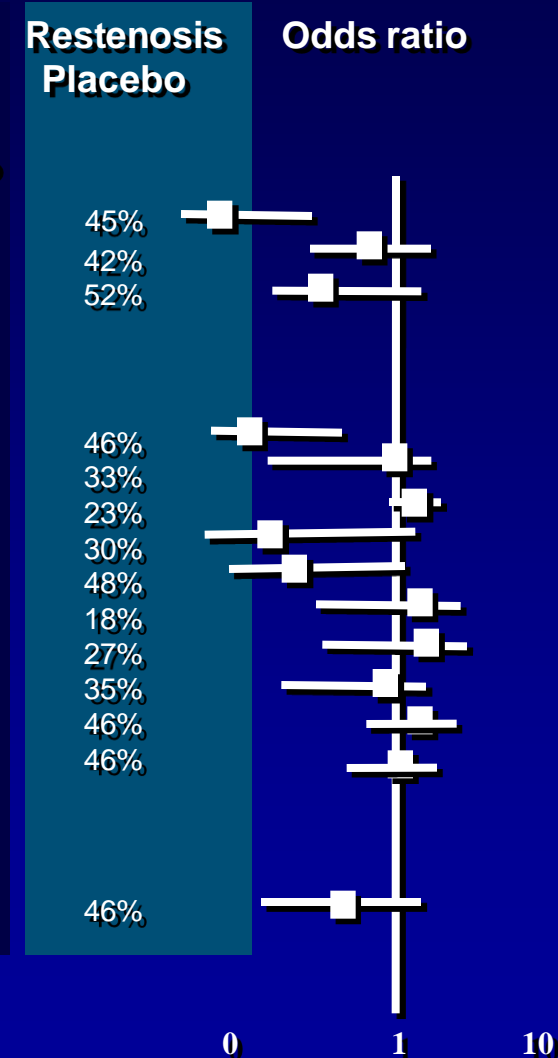


Clinical trials evaluating Antiproliferative agents

Trial	year	Nº	Control Angio	Droug (s) /dose	Stenosis Definition	Restenosis Drug	Restenosis Placebo	Odds ratio
Steroids vs Placebo								
Rose	1987	66	88%	Medrol 48mg	≥ 50%	33%	33%	
Stone	1989	102	53%	Metilprednisolona 125mg + Prednisolona 60mg/d	≥ 50%	59%	58%	
Pepine	1990	722	71%	Mtilprednisolona 1mg/d	≥ 50%	43%	43%	
Colchicina vs Placebo								
O'Keefe	1992	197	74%	Colchicina 1.2mg	≥ 70%	41%	45%	
Trapidil vs AAS								
Okamoto	1992	90	80%	TP 600mg vs AAS 300mg	pérdida ≥ 50%	19%	42%	
Maresta	1994	254	74%	TP300mg vs AAS 300mg	pérdida ≥ 50%	24%	40%	
Angioeptin vs Placebo								
Kent	1993	1246	87%	AP 190-300µg/10días	≥ 50%	35-38%	39%	
Emanuelsson	1995	546	76%	AP pre y post ATC	≥ 50%	37%	36%	
Eriksen	1995	112	94%	AP pre y post ATC	≥ 50%	12%	40%	
Transilast vs Placebo								
Ueda	1995	205 les.	100%	Transilast 600mg/d	pérdida ≥ 50%	22%	46%	

Clinical trials evaluating oral lipid lowering

Trial	year	Nº	Control Angio	Drug(s) /dosis	Stenosis definition	Restenosis Drug	Restenosis Placebo	Odds ratio
Hidroxi metilglutamil-coenzima A (HMG-Co A) Reductase inhibitors vs Placebo								
Sahni	1990	157	50%	Lovastatin 20mg/d	≥ 50%	12%	45%	
Weintraub	1994	404	79%	Lovastatin 80mg/d	≥ 50%	39%	42%	
Yui	1995	208	100%	Pravastatin 20mg/d	≥ 50%	41%	52%	
Mufson	1995	453	37%	Lov 40mg/d + Prav 1g/d				
Fish oil vs Placebo								
Denher	1988	82	100%	ω3FA 5.4gr	≥ 50%	19%	46%	
Grigg	1989	108	93%	ω3FA 3.0gr	pérdida ≥ 50%	34%	33%	
Reis	1989	186	30%	ω3FA 6.0gr	≥ 70%	34%	23%	
Nye	1990	73	95%	ω3FA 2.2gr	pérdida ≥ 50%	11%	30%	
Bairati	1992	119	100%	ω3FA 4.5gr	≥ 50%	31%	48%	
Bellamy	1992	120	94%	ω3FA 3.0gr	pérdida ≥ 50%	21%	18%	
Kaul	1992	107	100%	ω3FA 3.0gr	≥ 50%	35%	27%	
Franzen	1993	200	65%	ω3FA 3.2gr	≥ 50%	33%	35%	
Leaf	1994	551	81%	ω3FA 6.9gr	≥ 50%	52%	46%	
Cairns	1994	668	88%	ω3FA 5.4gr	pérdida ≥ 50%	47%	46%	
LDL Apheresis vs Placebo								
Daida	1994	203	100%	LDL Aferesis	≥ 50%	32%	46%	

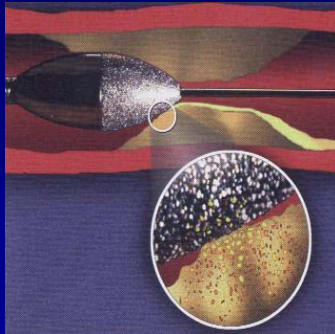




BOAT

Balloon vs Optimal Atherectomy Trial

Baim D; Cutlip D; Sharma S. Circulation 1998



COBRA Rotablator™

Erbel. Circulation 1997

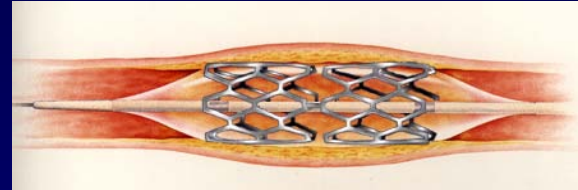


Excimer Laser

Ligh **A**mplification by **S**timulated **E**mission of **R**adiation

F. Litvack. Am J Cardiol 1994

Palmaz balloon expandable stent

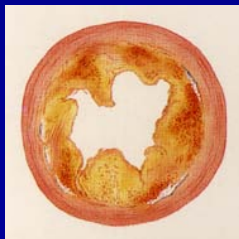


Balloon expanded stent



Balloon angioplasty

Stent implanted

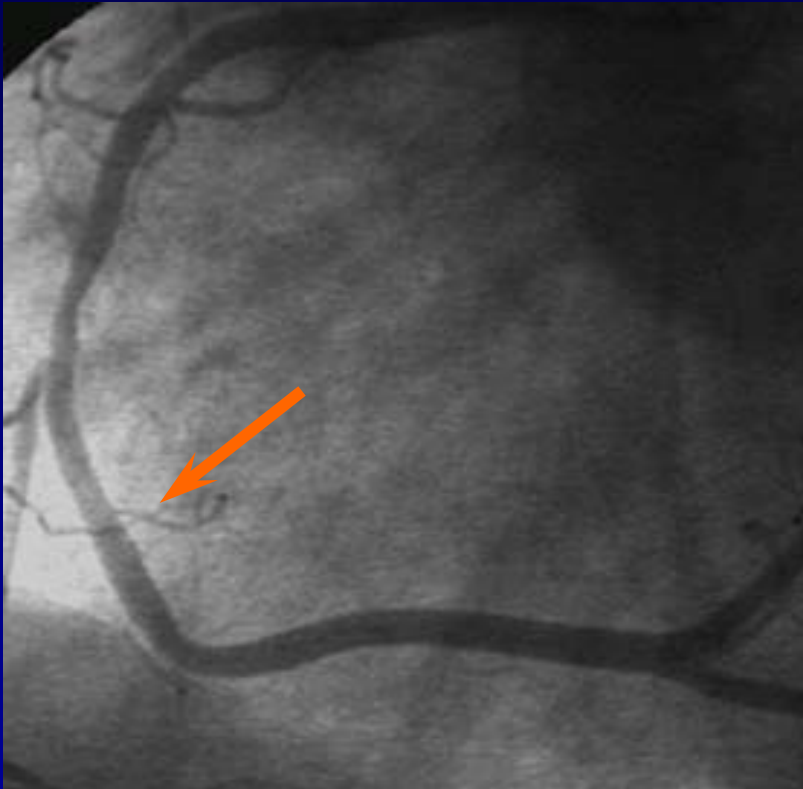


Balloon result



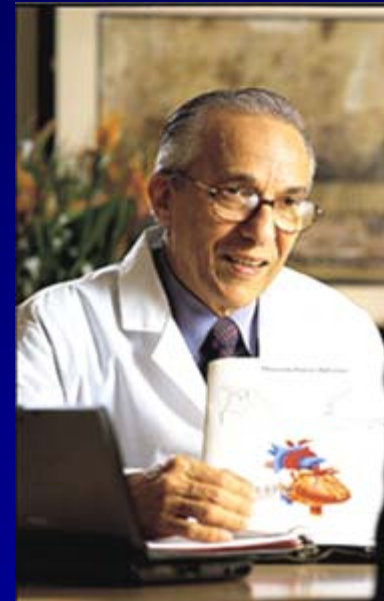
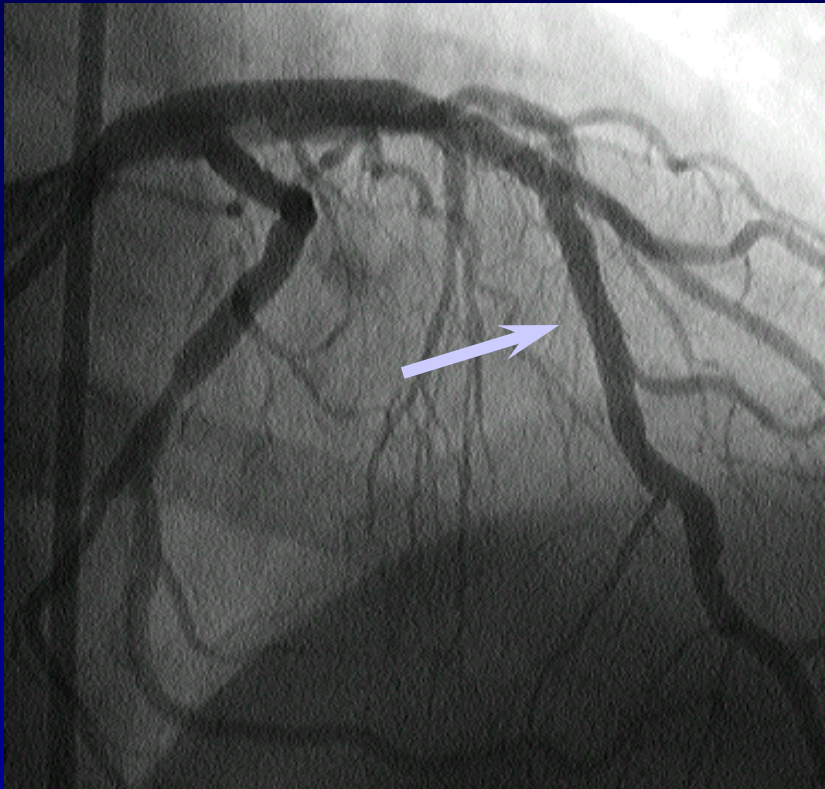
Stent result

First Palmaz-Schatz™ (1986)



13-years post stent

First Cypher™ (1999)



2-years post DES stenting

MEGAMETANALYSIS

Target-vessel revascularization

Study type	Patients, n	Trials, n	Relative risk	P*
RCT: all	7291	16	0.45	<0.001
RCT: on-label	4618	9	0.53	<0.001
RCT: off-label	2673	8	0.38	<0.001
Registries	73 819	17	0.53	<0.001

*Random-effects model

↓ 47 to 62%

MEGAMETANALYSIS

All-cause mortality

Study type	Patients, n	Trials, n	Relative risk	p
RCT: all	8867	21	0.97	0.72 ^a
RCT: on-label	4818	10	1.05	0.69 ^a
RCT: off-label	4049	12	0.84	0.24 ^a
Registries	161 232	28	0.80	<0.001 ^b ↓ 20%

a. Fixed-effects model
b. Random-effects model

De la práctica a la evidencia

1977: Angioplastía por balón → 1981 (Registro NHBLI)

1984: Atherectomy (directional) → 1993 (CAVEAT)

1988: Atherectomy (rotational) → 1993 (Registro multicéntrico)

1987: Stent angioplasty → 1994 (BENESTENT)

De la evidencia a la práctica

2001		FIM	= 30 patients
2002		RAVEL	= 238 patients
2003		SIRIUS	= 1100 patients
		TAXUS I, II, III, IV, V, VI, ASPECT, ELUTES ...	+ DE 200.000 PACIENTES

E ITALO
H

INST DE

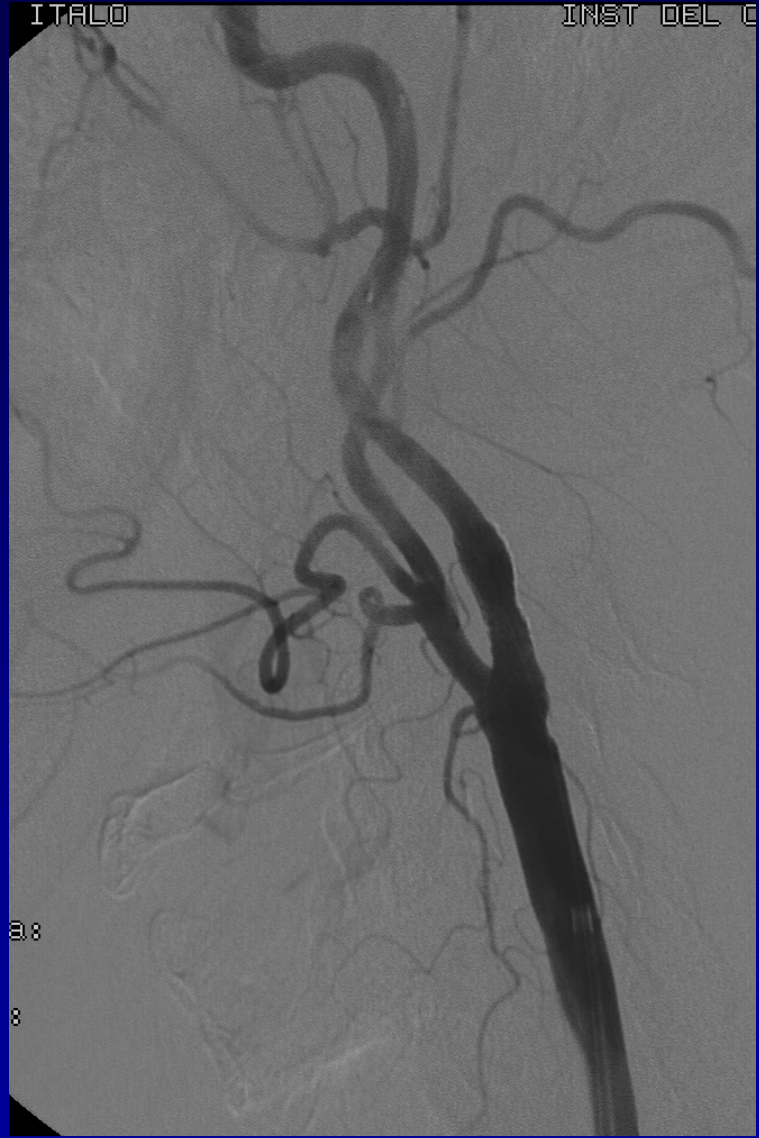


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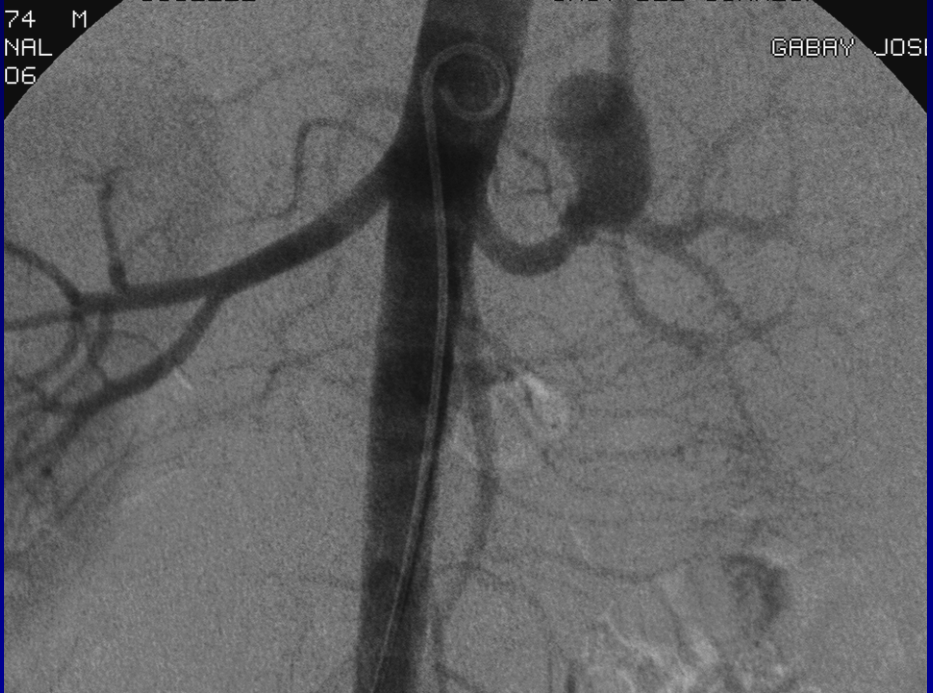
ITALO

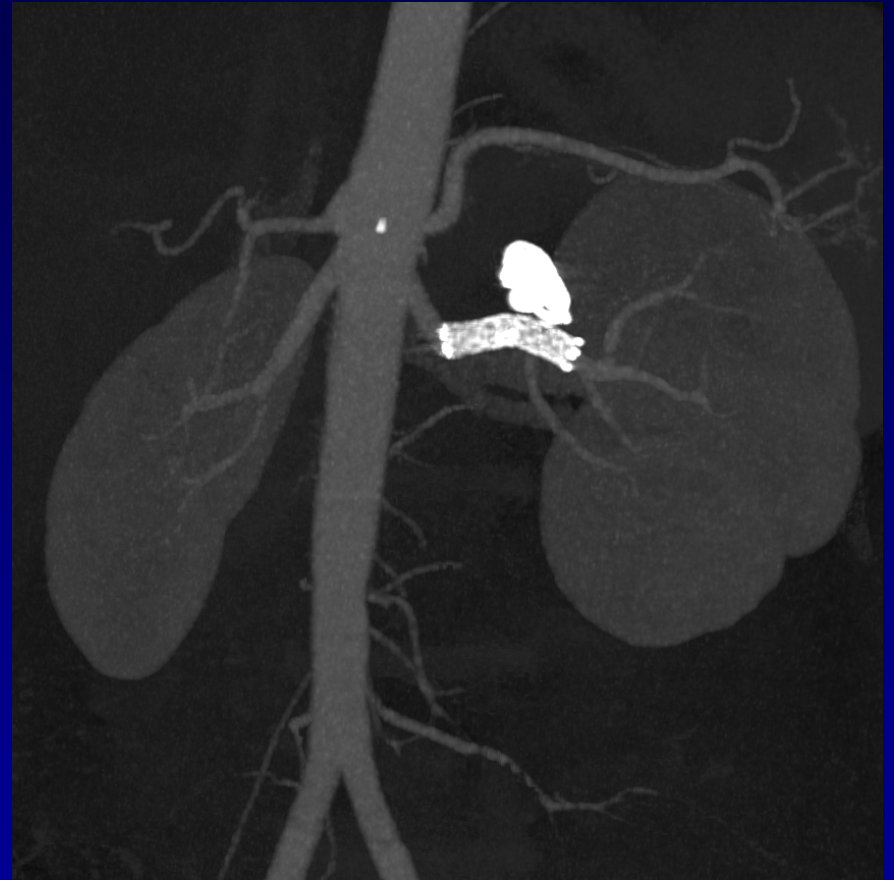
INST DEL C



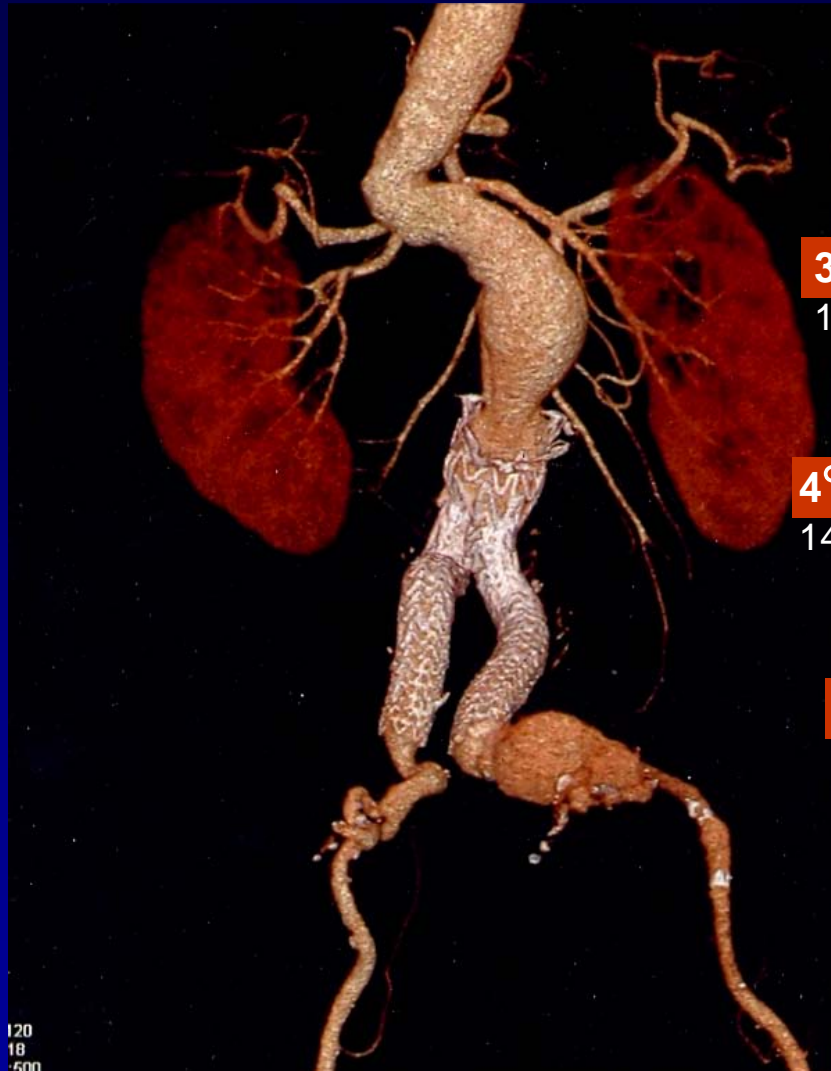
ra:

n:





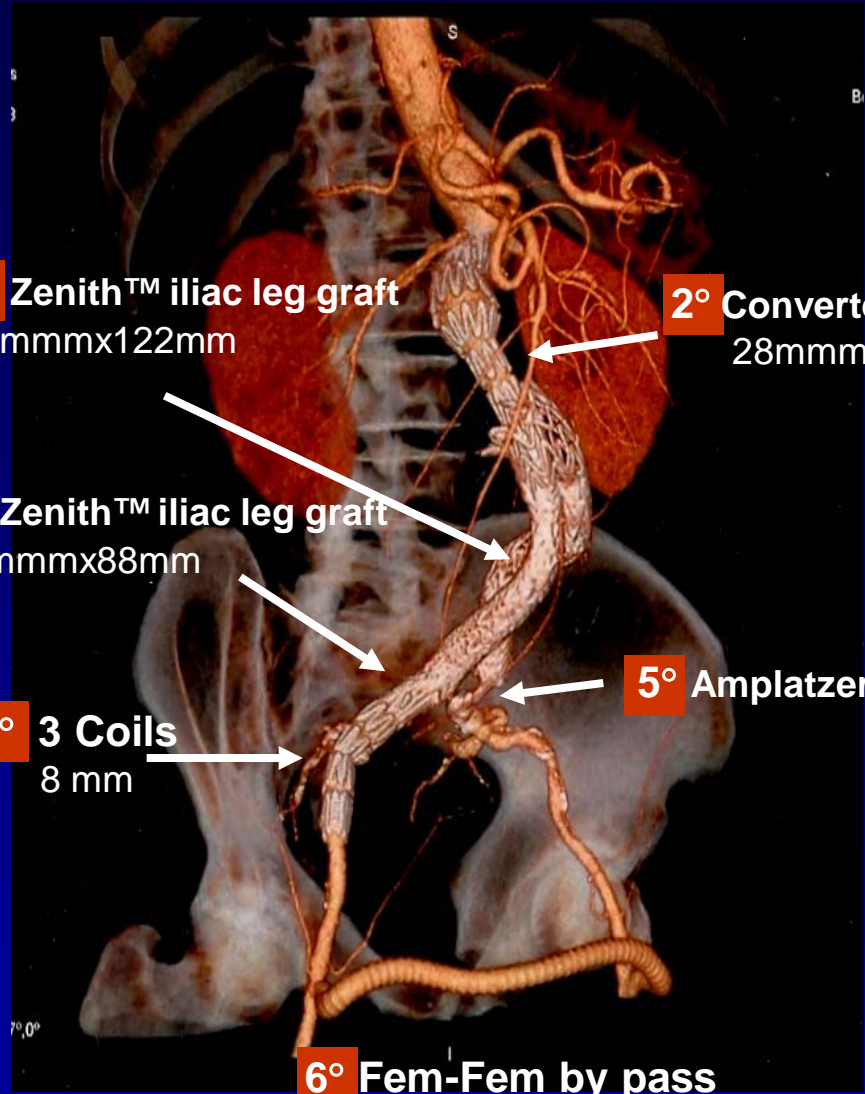




3° Zenith™ iliac leg graft
12mmx122mm

4° Zenith™ iliac leg graft
14mmx88mm

1° 3 Coils
8 mm

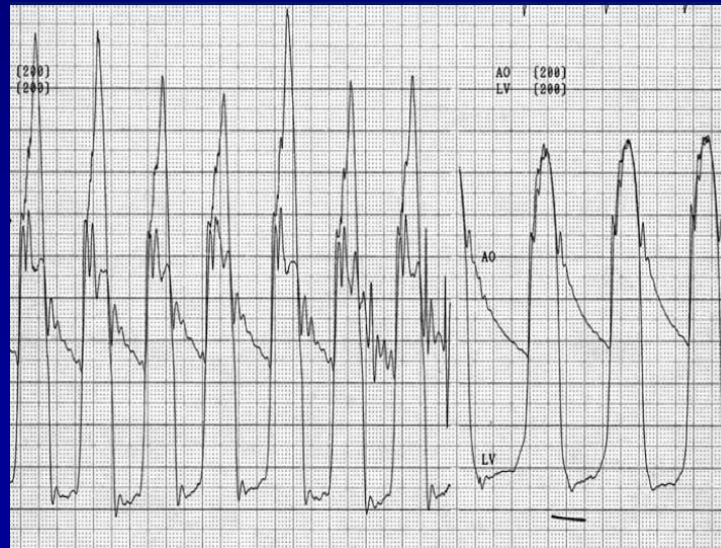
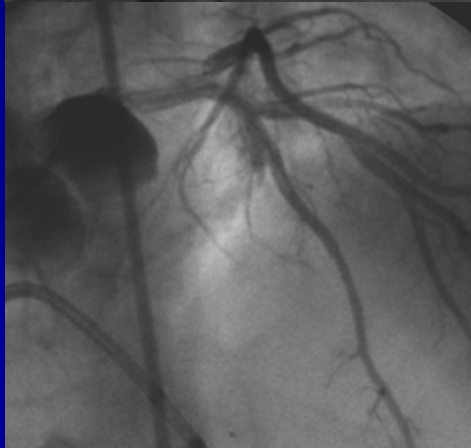
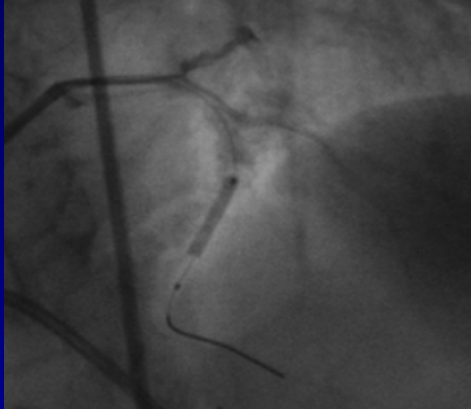


2° Converter Renu™
28mmx108mm

5° Amplatzer™ 18

6° Fem-Fem by pass

IHSS



En 2009

EDWARDS Sapien



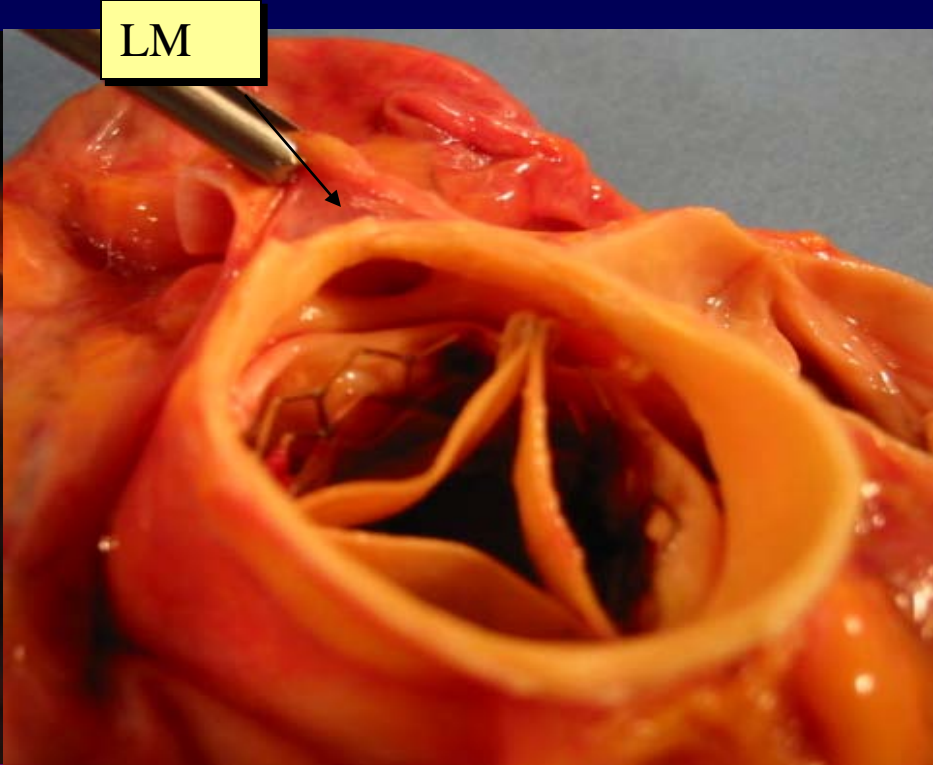
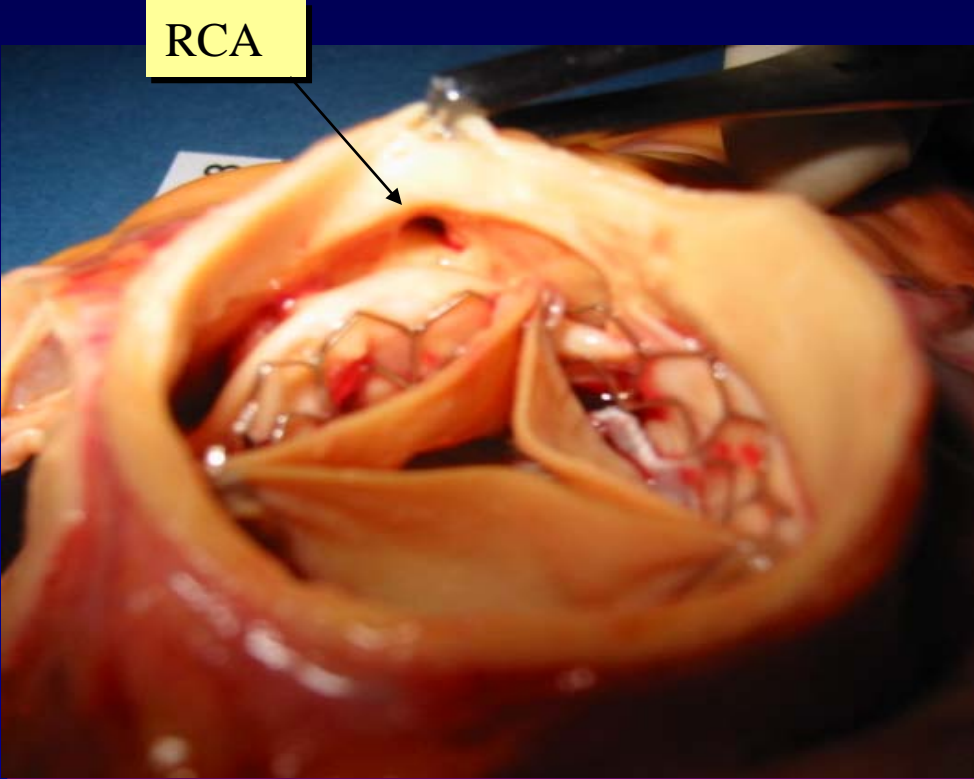
Balon-expandible

COREVALVE



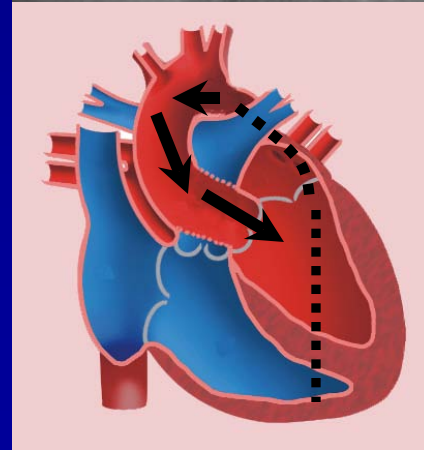
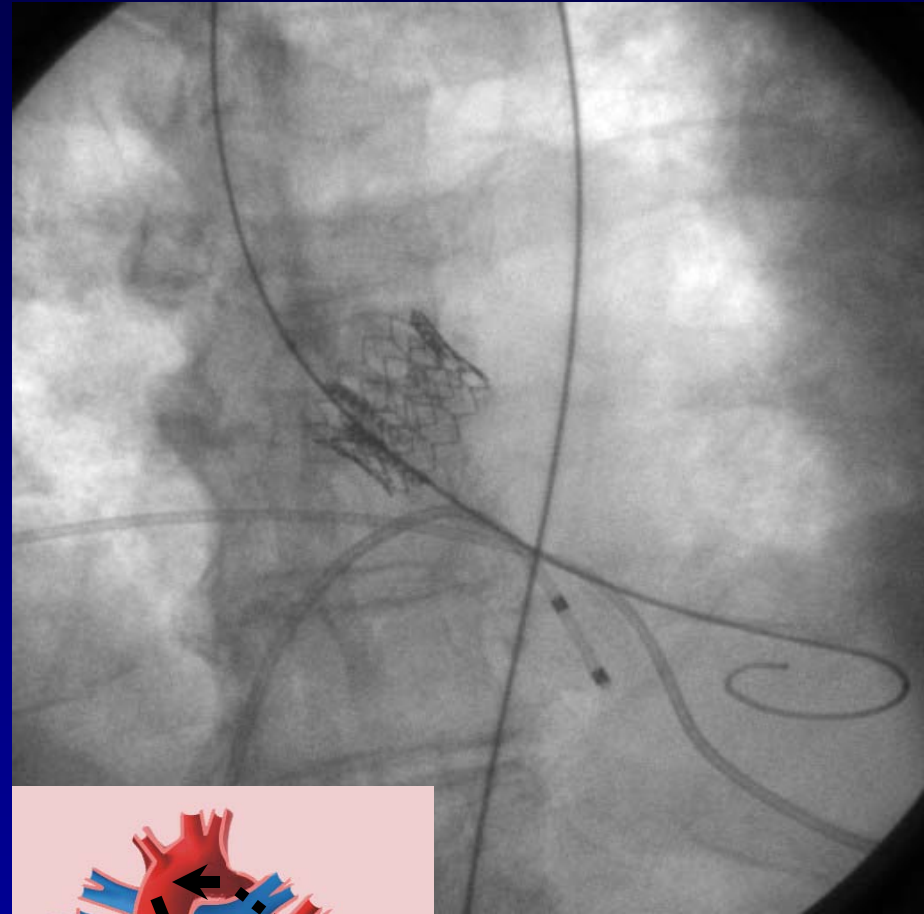
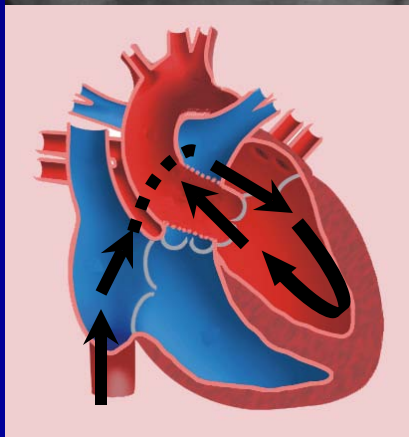
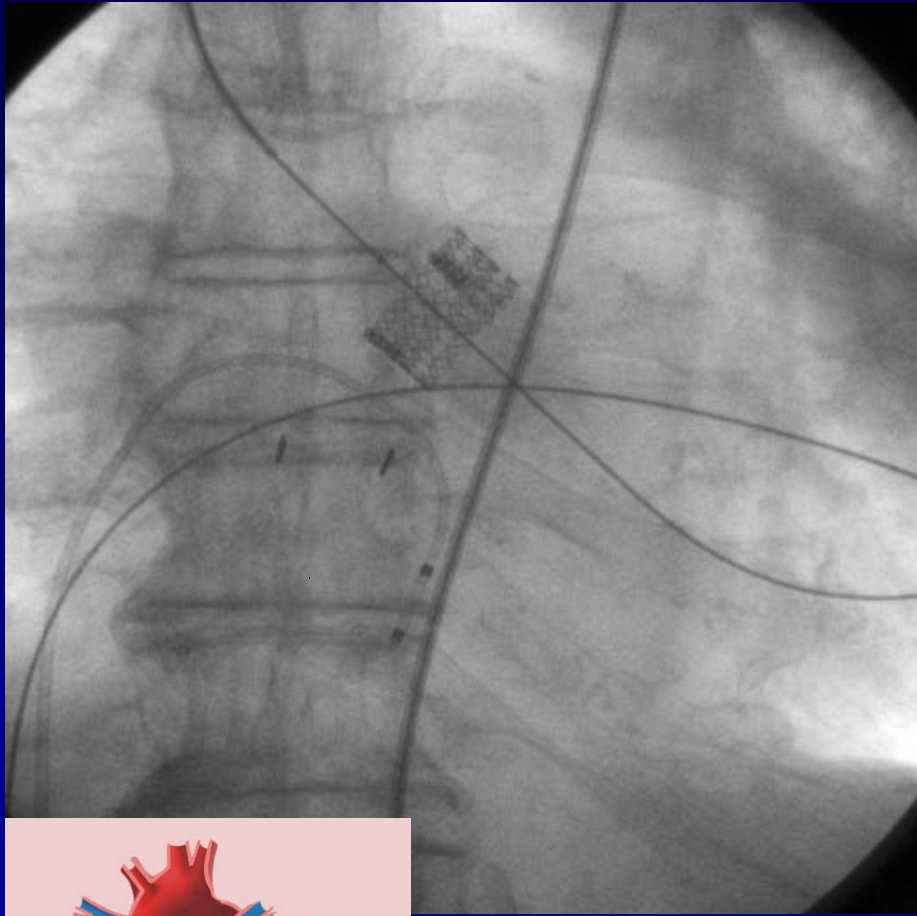
Auto-expandable

> 5 000 Pacientes tratados



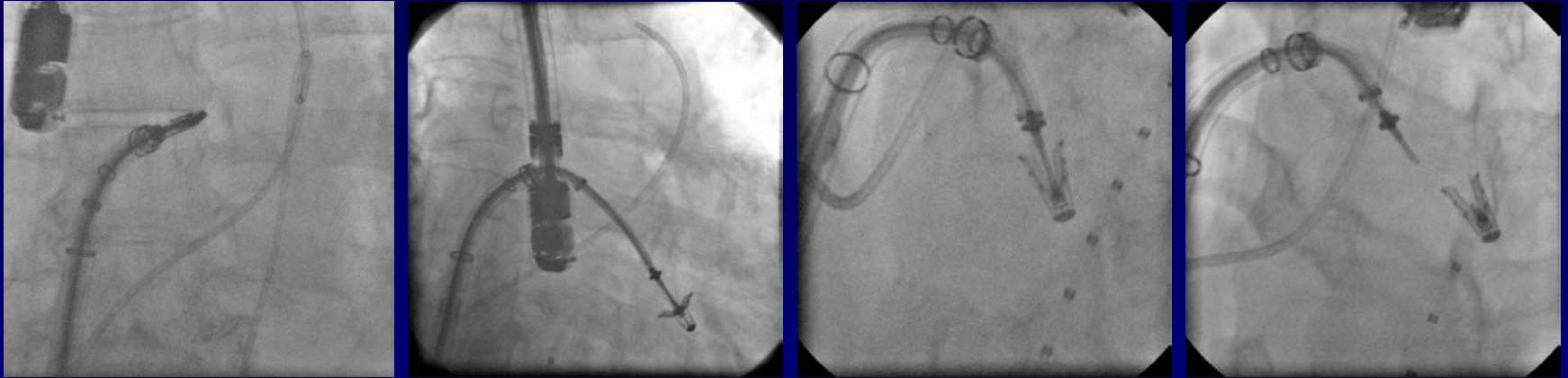
AVA: 1.7 cm²

Antegrade and Retrograde Approach

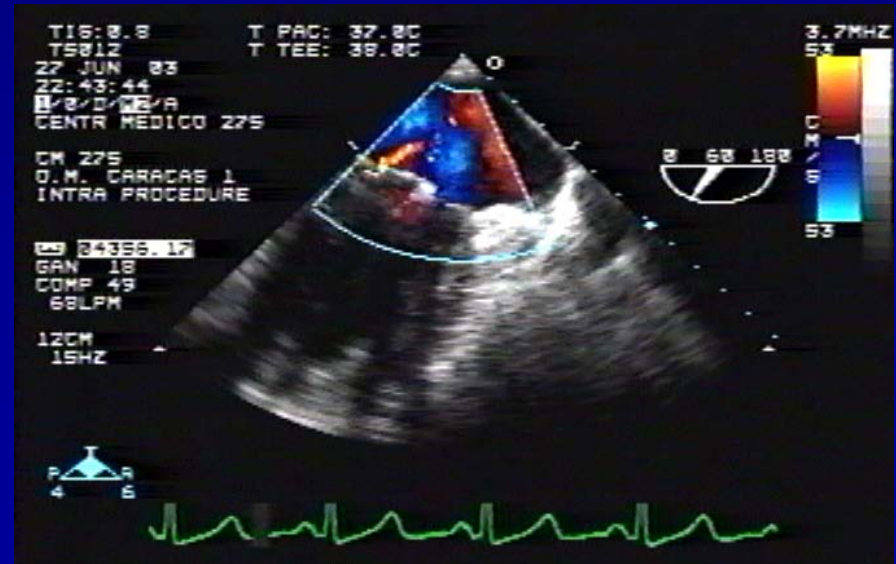
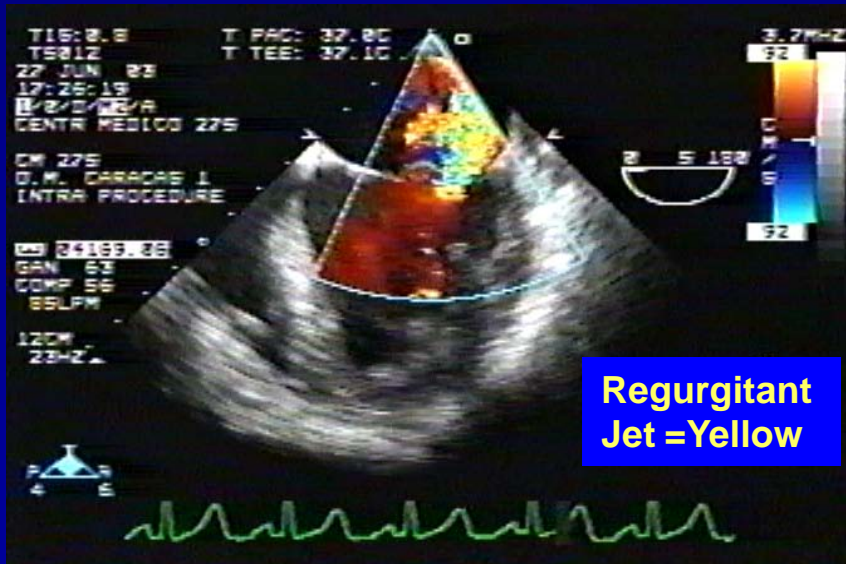


Evalve™ Mitral Repair System

Severe MR reduced to Trace MR

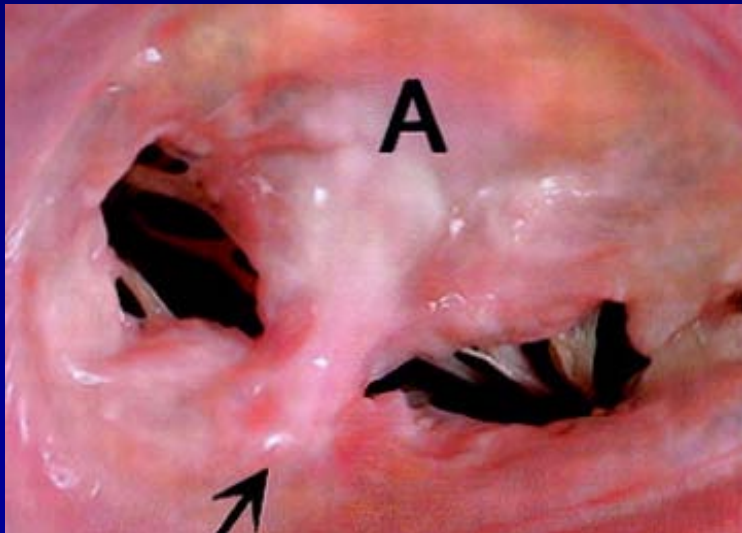


Performed in Cath Lab, Quick Recovery, No Morbidity



Evalve™ Healing Results

- edge-to-edge repair
- explanted human heart
- 4yrs post repair

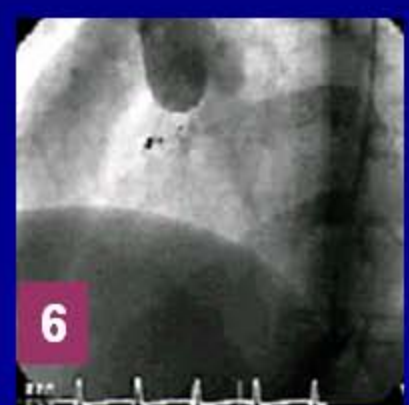
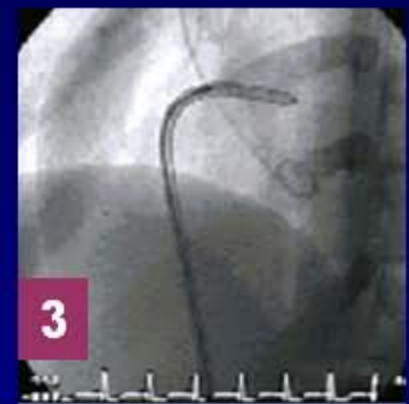
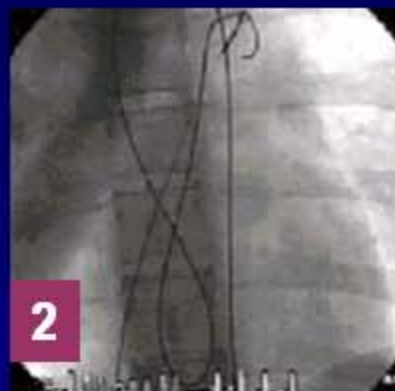


- Evalve repair
- porcine heart
- 6 mos post repair



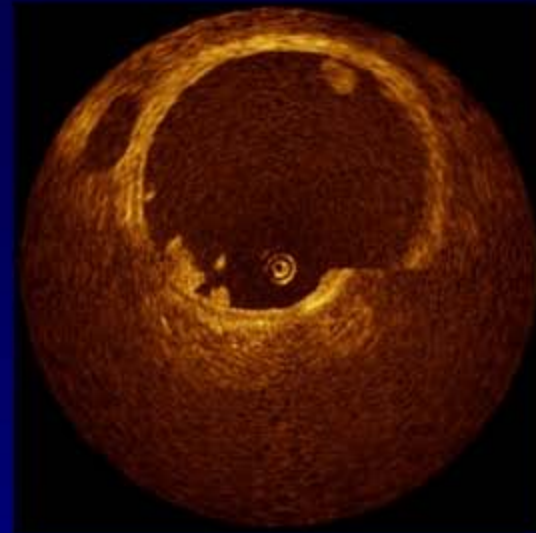


Amplatzer® closure device

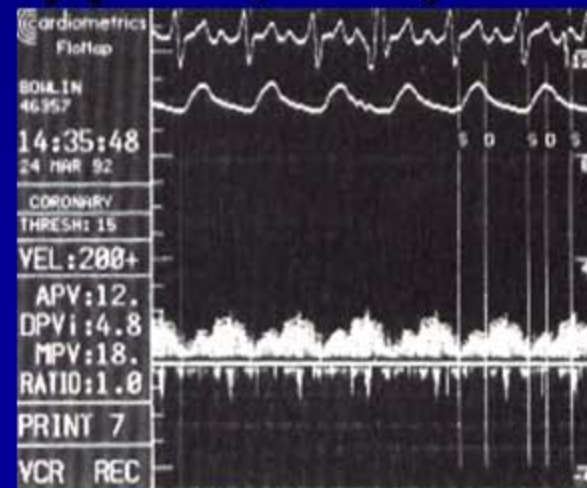
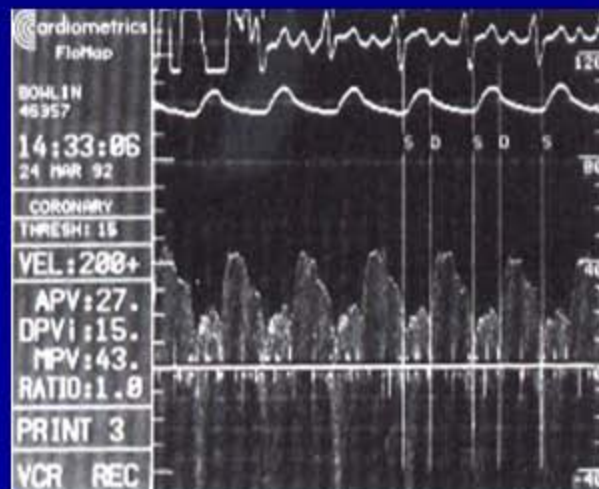


IVUS

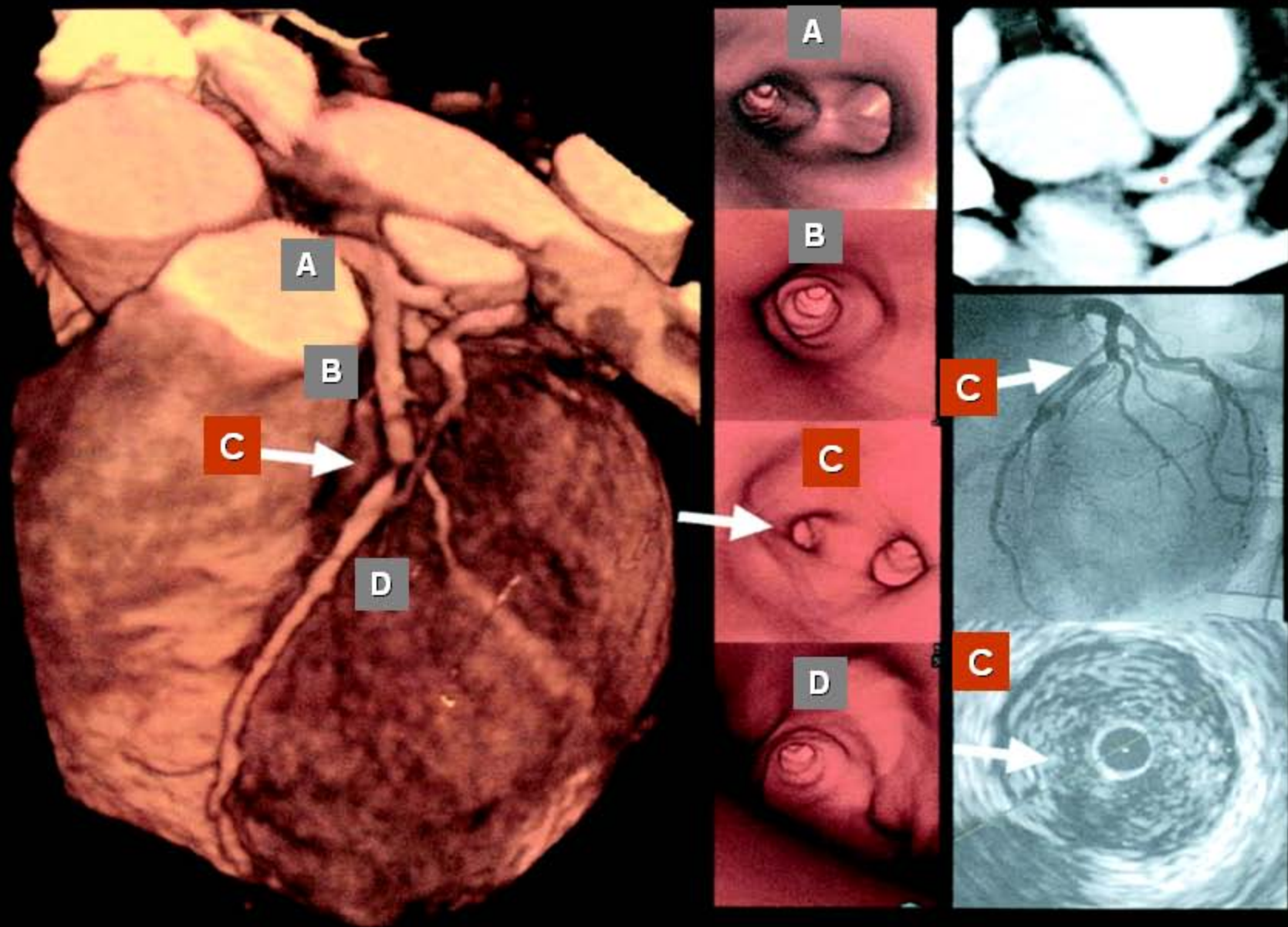
OCT



Intracoronary doppler (FFR)



TC multilice



SIGLO XXI
NUEVAS FRONTERAS

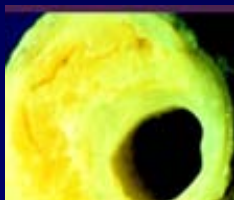
Placa estable

Placa vulnerable

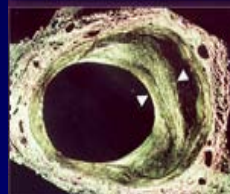
Remodelamiento +

Inflamación

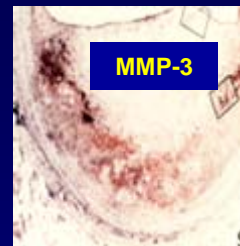
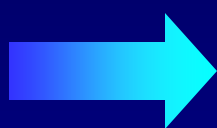
Gran core lipídico



Placa estable



Placa Vulnerable



MMP-3



MMP-3
Macrófagos

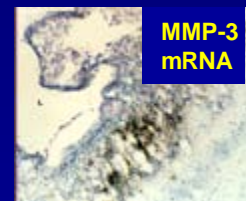


Apoptosis
Macrófagos

Depleción de colágeno
de la cápsula fibrosa

degradación de la matriz

Afinamiento
de la cápsula fibrosa



MMP-3
mRNA



Macrófagos

Clínica=Asintomático o ACE Clínica=Asintomático o ACE

Adaptada de Davies MJ Indian Heart Journal 2000; Virmani R. 2000; Sha PK. ACC2002
Pasterkamp G et al. JACC. 1998; 32: 655
Galis ZS et al. J Clin Invest. 1994; 94: 2493
Mallat Z et al. Circulation. 1999; 99: 348

PREVENCIÓN

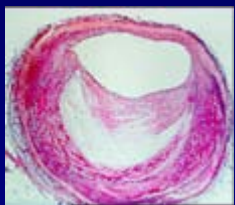
PREVENCIÓN

ESTRATIFICACIÓN

INTERVENCIÓN ?

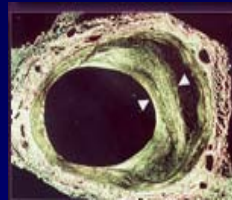
ESTRATIFICACIÓN

INTERVENCIÓN



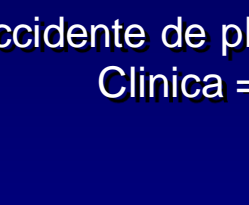
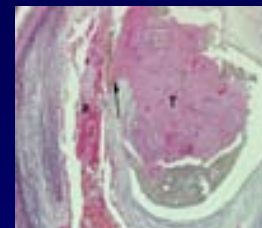
Placa estable

Clínica=Asintomático o ACE

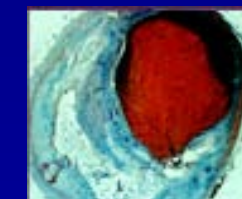


Placa Vulnerable

Clínica=Asintomático o ACE



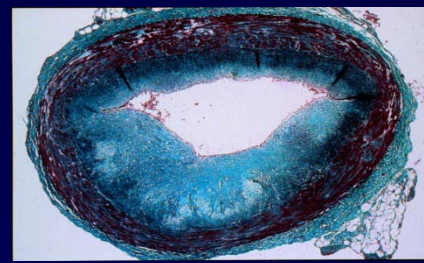
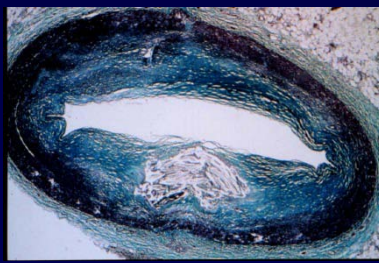
Accidente de placa SIN oclusión
Clínica = SIA ST



Accidente de placa CON oclusión
Clínica = IAM ST

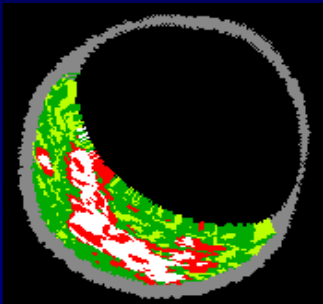
Adaptada de Davies MJ Indian Heart Journal 2000; Virmani R. 2000; Sha PK. ACC2002
Pasterkamp G et al. JACC. 1998; 32: 655
Galis ZS et al. J Clin Invest. 1994; 94: 2493
Mallat Z et al. Circulation. 1999; 99: 348

**Active and
inflamed
plaque**



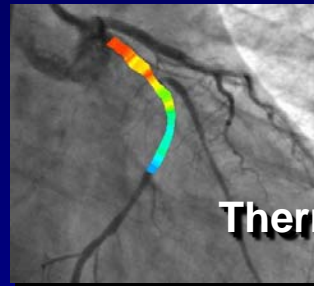
**Inactive and
non-inflamed
plaque**

Morphology



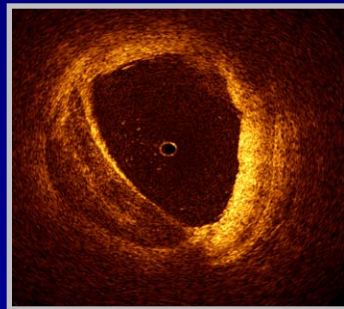
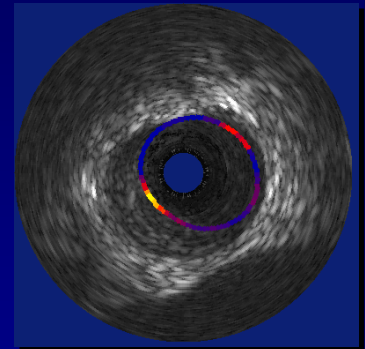
**Virtual
histology**

**Activity -
Chemistry**

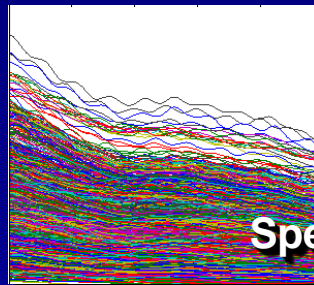


Thermography

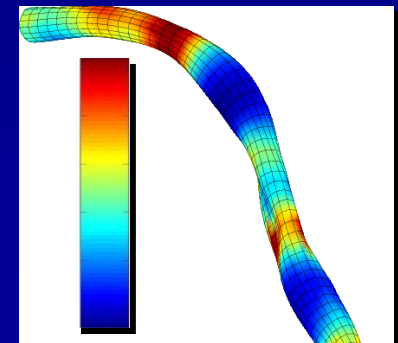
**Physical
properties**



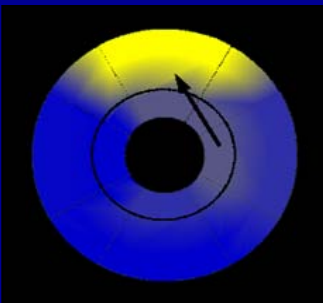
OCT



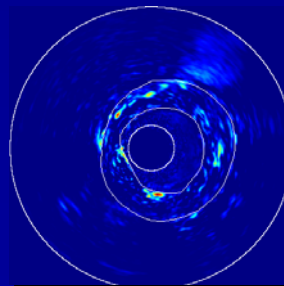
Spectroscopy

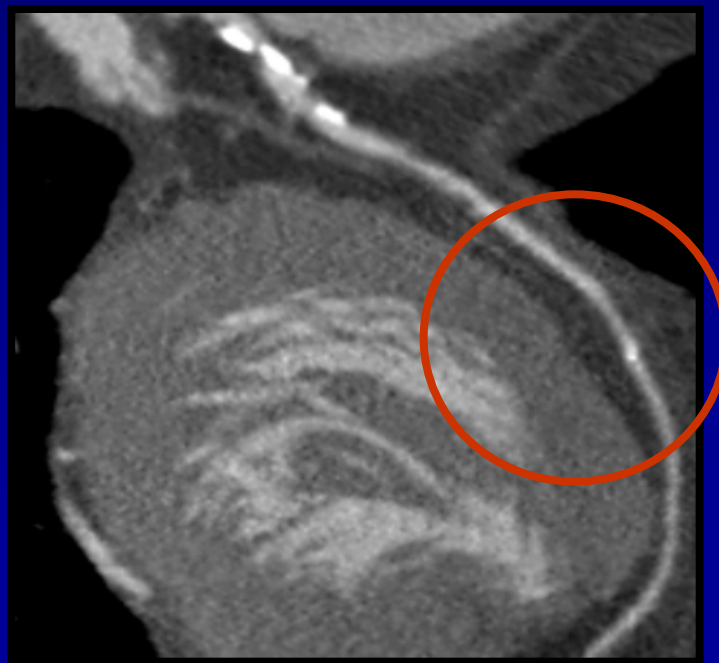
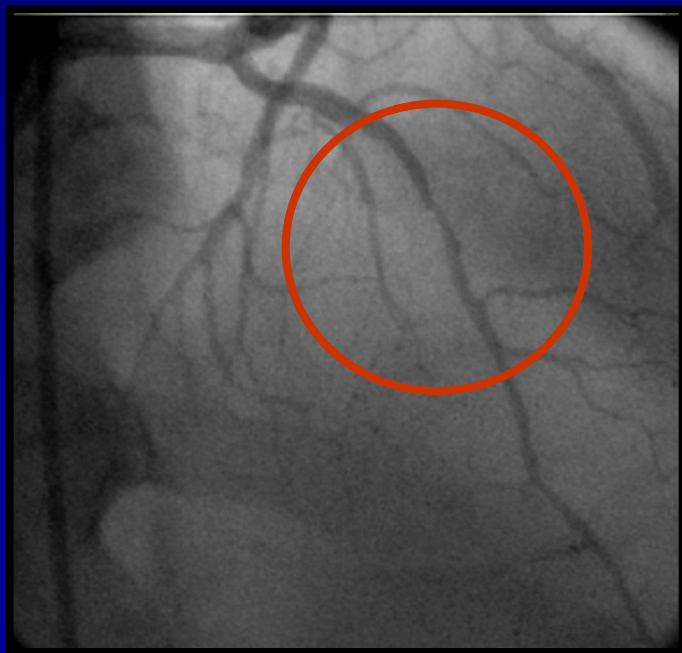
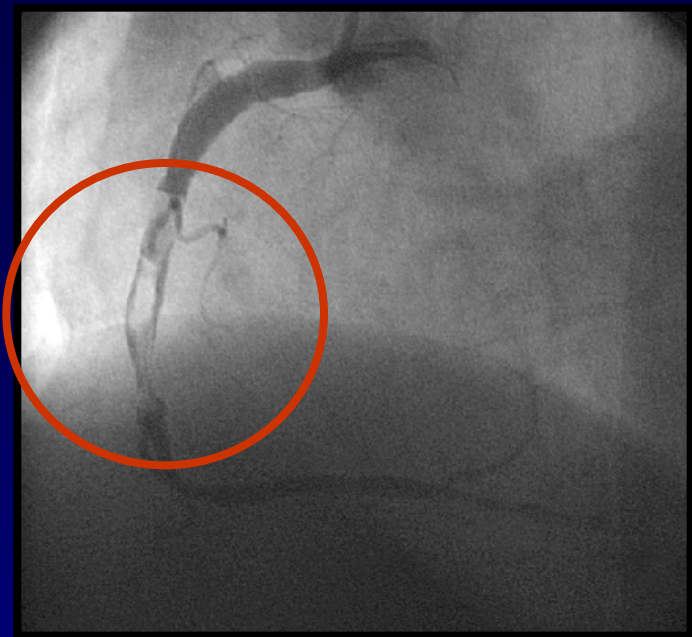


**Endothelial
shear stress**

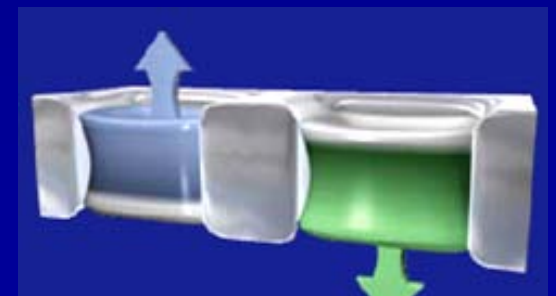
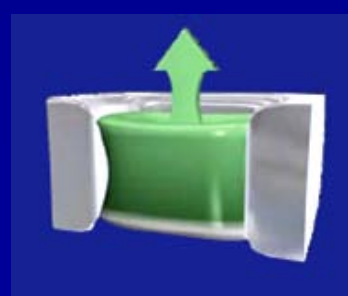
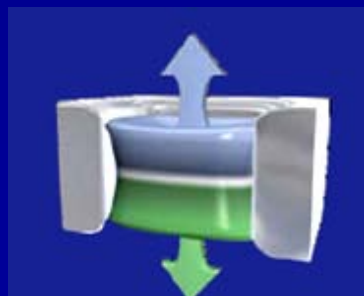
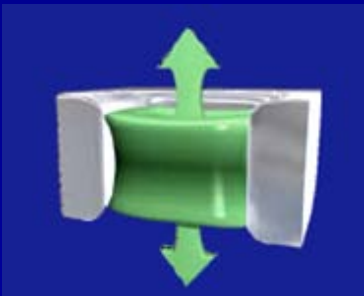
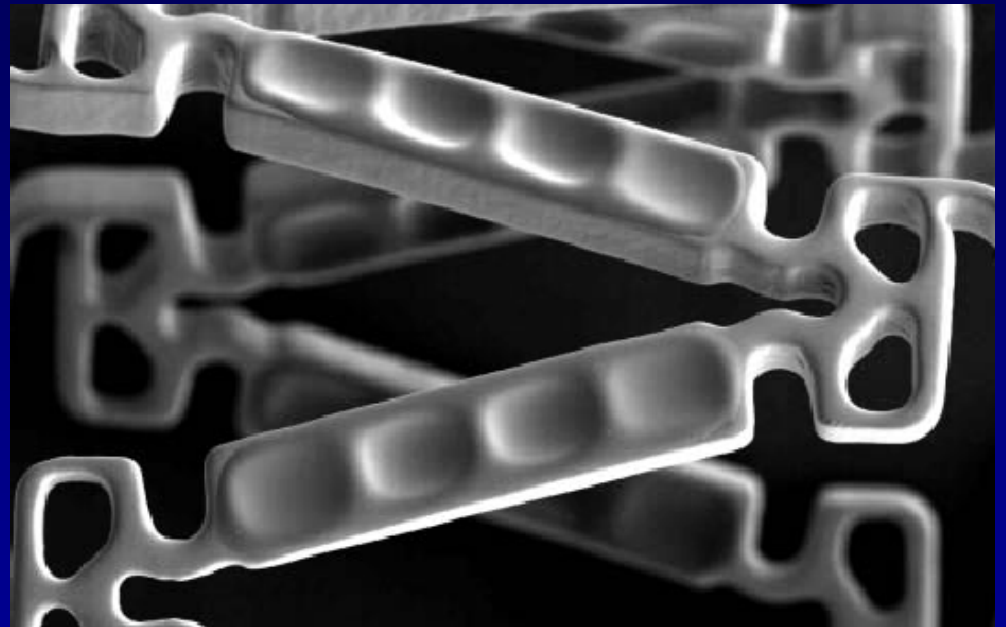
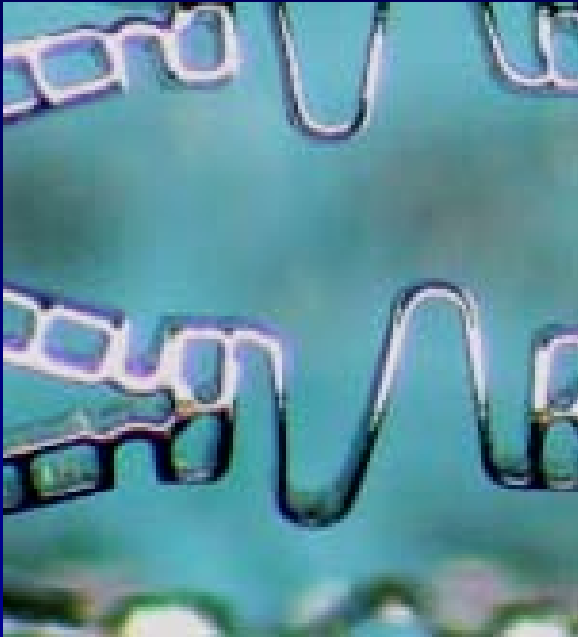


IV MRI

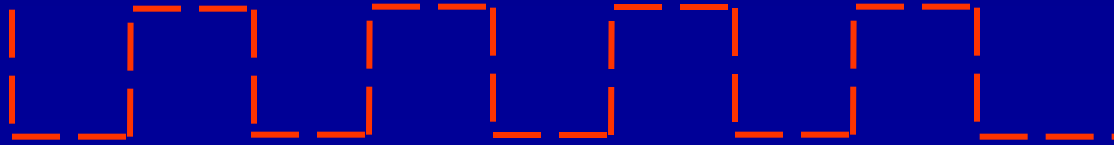
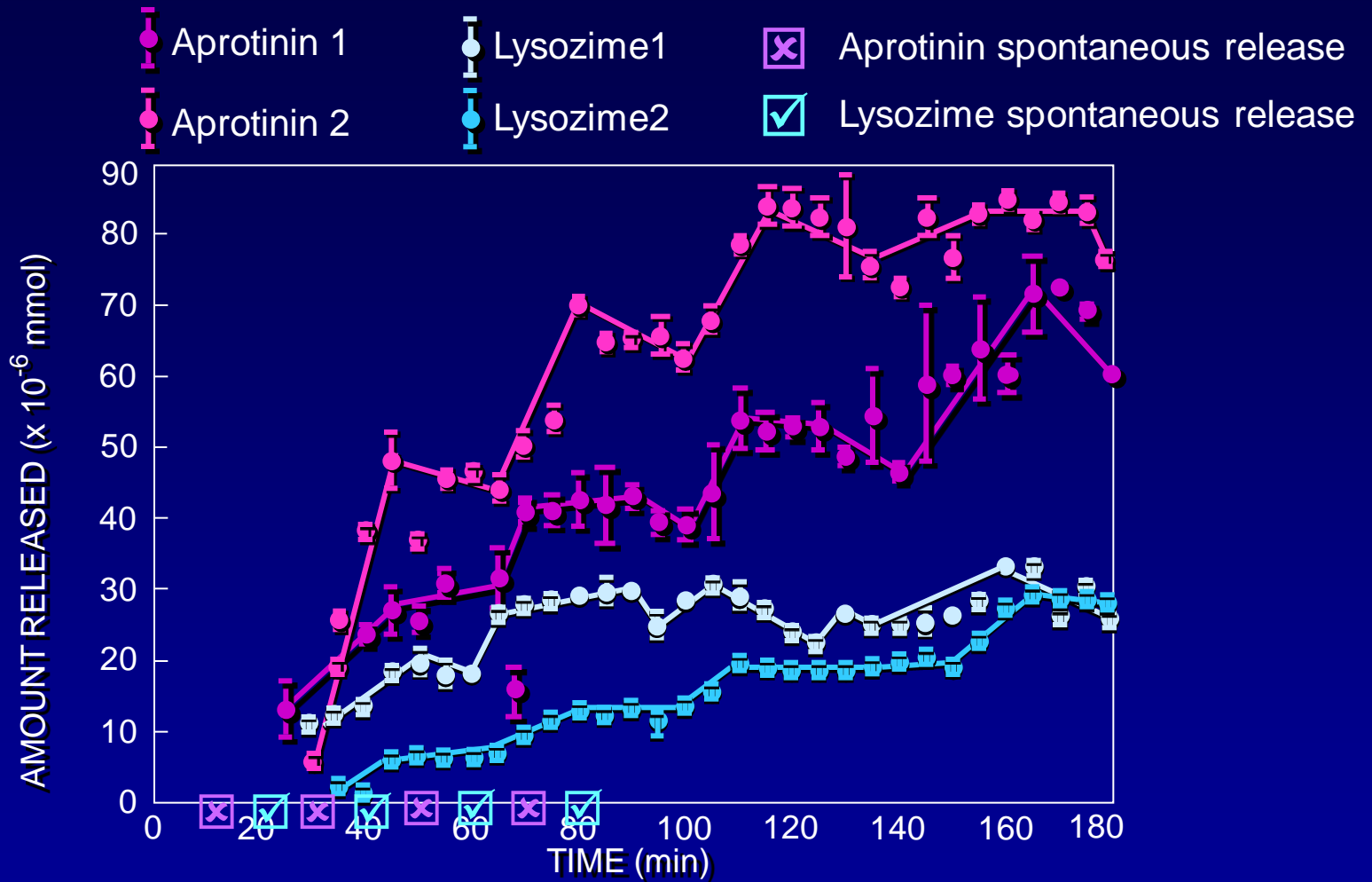


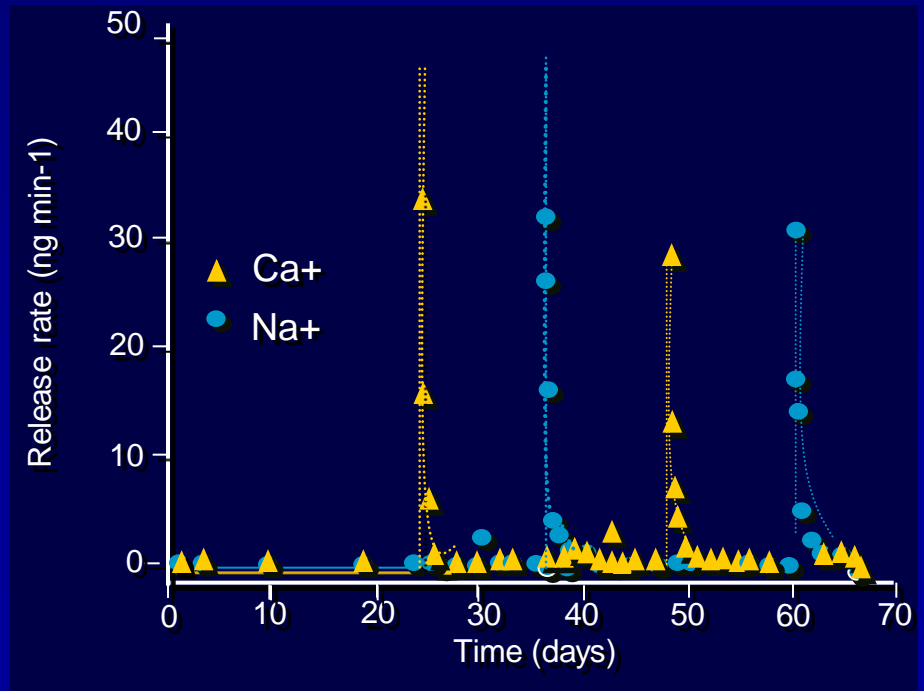
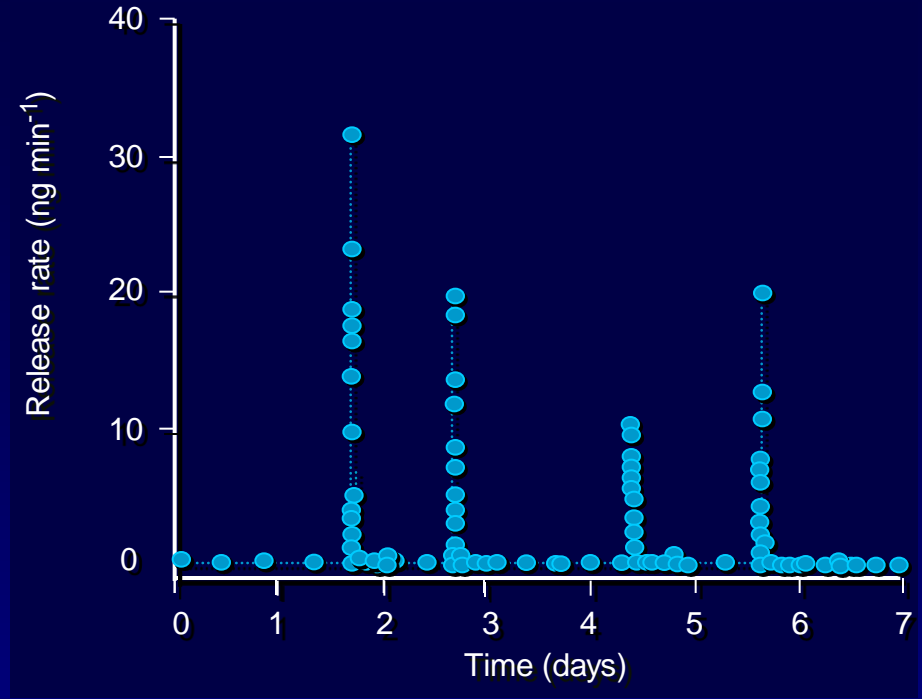
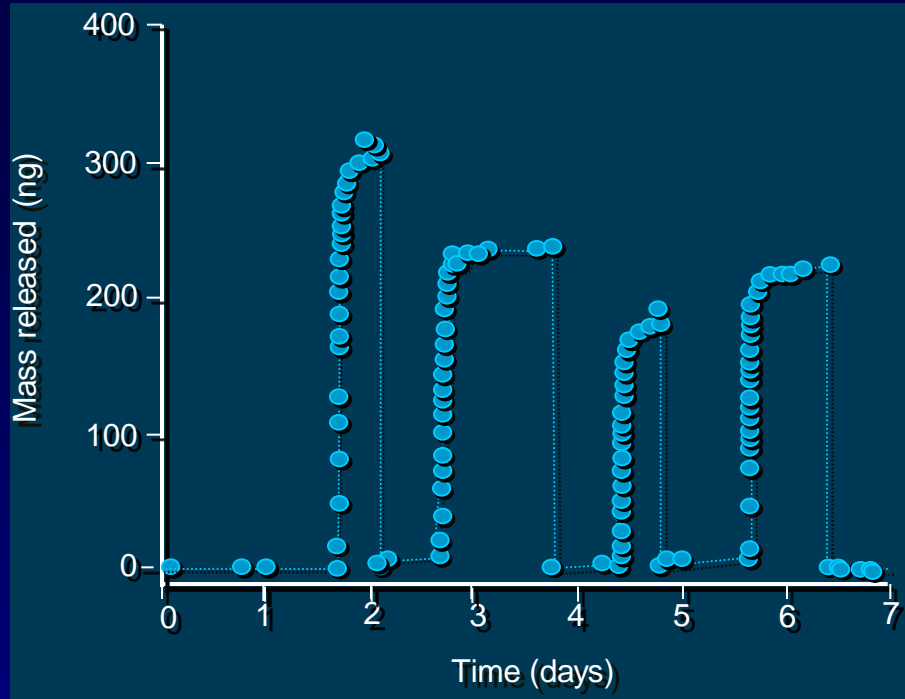


Drugs deposited in multi-layered degradable polymer inlays

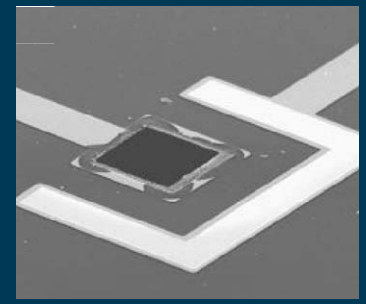
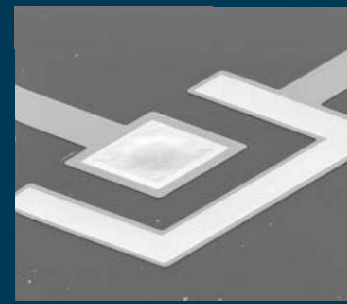


Chondrityn 4-sulphate hydrogel

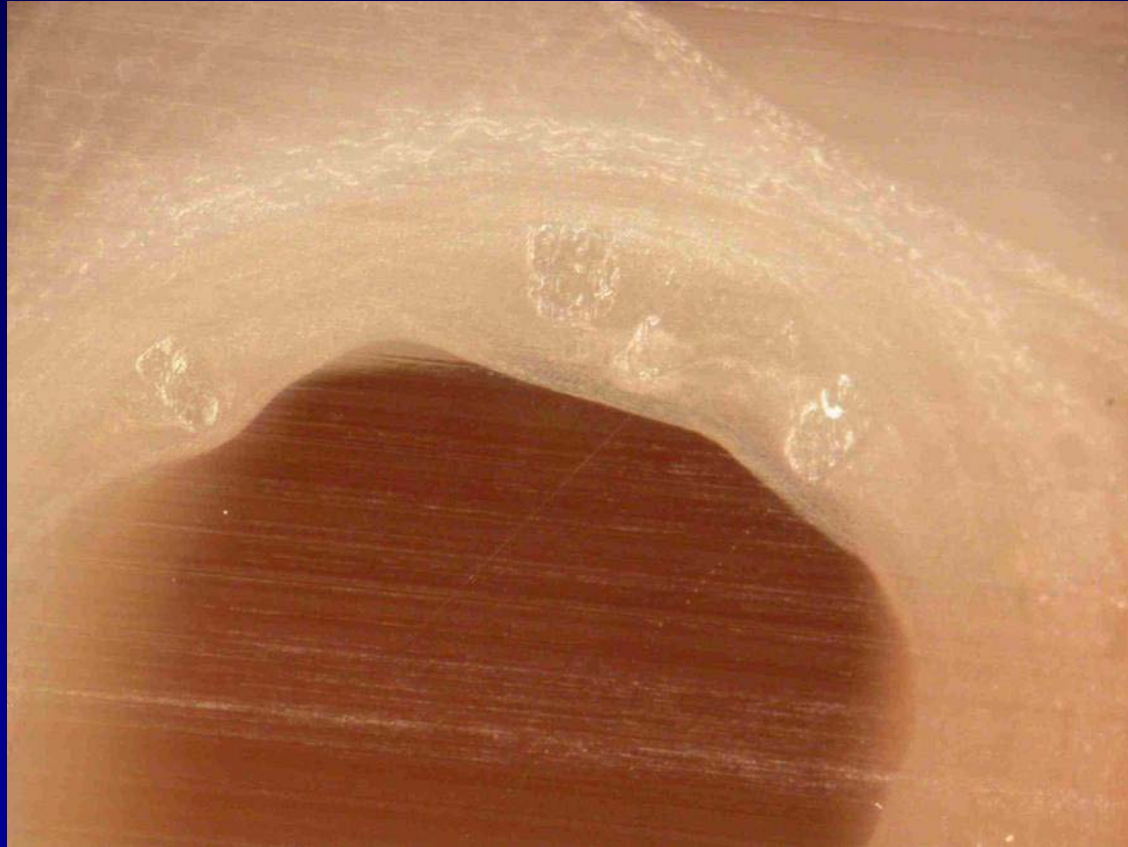




Controlled-release microchip



Absorbable metallic Mg+ stent



BVS

Bioabsorbable eVerolimus-eluting Stent; Abbott Vascular

	6 Months (n = 26)	2 Years (n = 19)	PValue
In-Stent RVD, mm	2.64	2.43	0.0058
In-Stent MLD, mm	1.89	1.76	0.23
In-Stent DS	27.0%	27.0%	0.81
In-Stent Late Loss, mm	0.43	0.48	0.233
Proximal Late Loss, mm	0.23	0.34	0.0553
Distal Late Loss, mm	0.23	0.36	0.0091
In-Stent Binary Restenosis	7.7%	0%	1.00
In-Segment Binary Restenosis	7.7%	0%	1.00

34.5% struts reduction over 2 years

JA Ormiston, PW Serruys et al
Lancet, 373, 9667: 887, .March 2009

Functional
PET, f MRI

X-Ray fluoroscopic display

Structural Echo Imaging

Clinical
Records

X-Ray imaging system

Video Camera

CT64, MRI

Functional Echo Imaging

Advanced QCA 6 QSA

Menu

Database

Modality

Patient

Table

Compliment

Ball

Export

Table

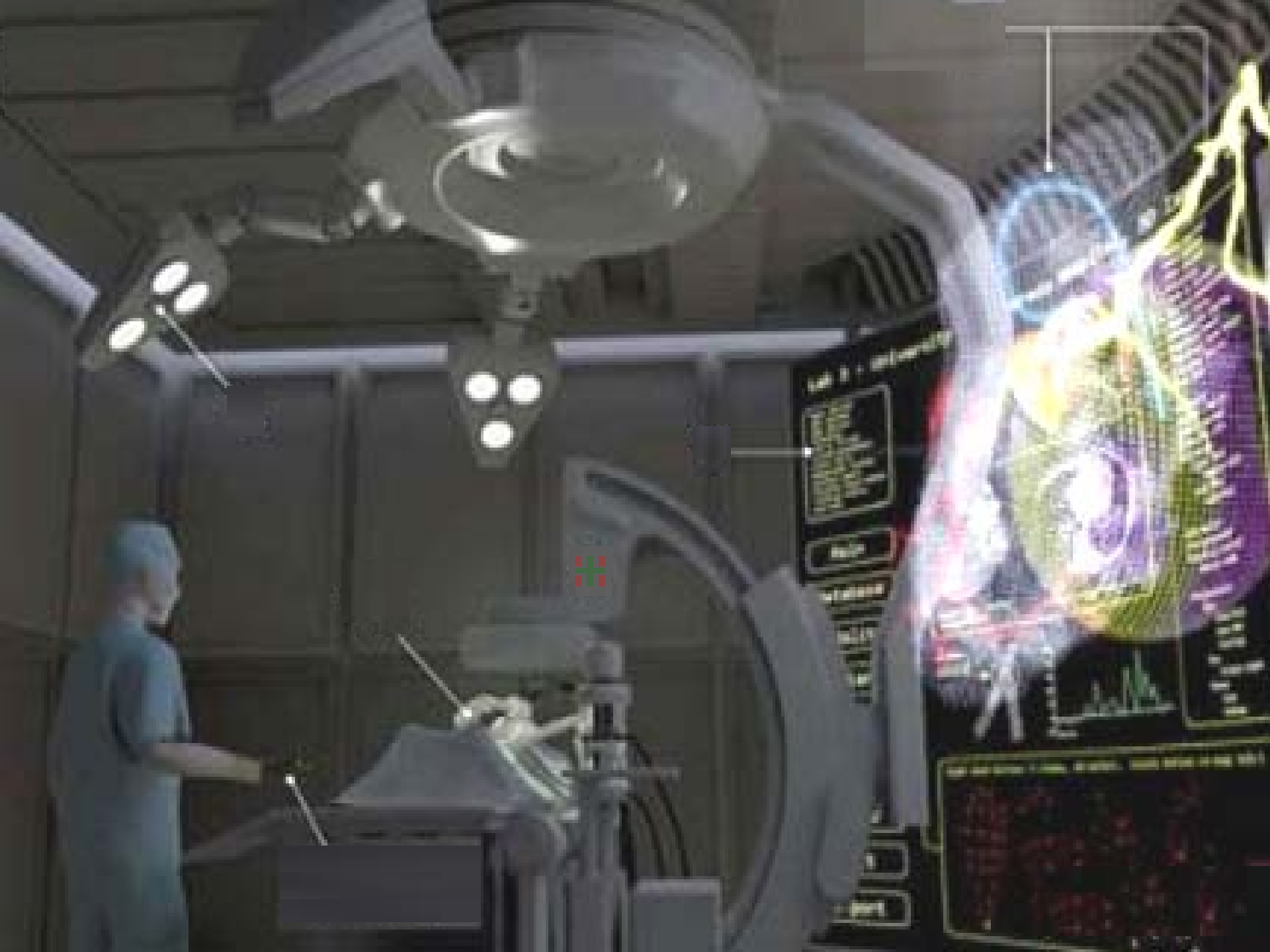
Robot
Manipulator

Advanced
Pathway
Analysis

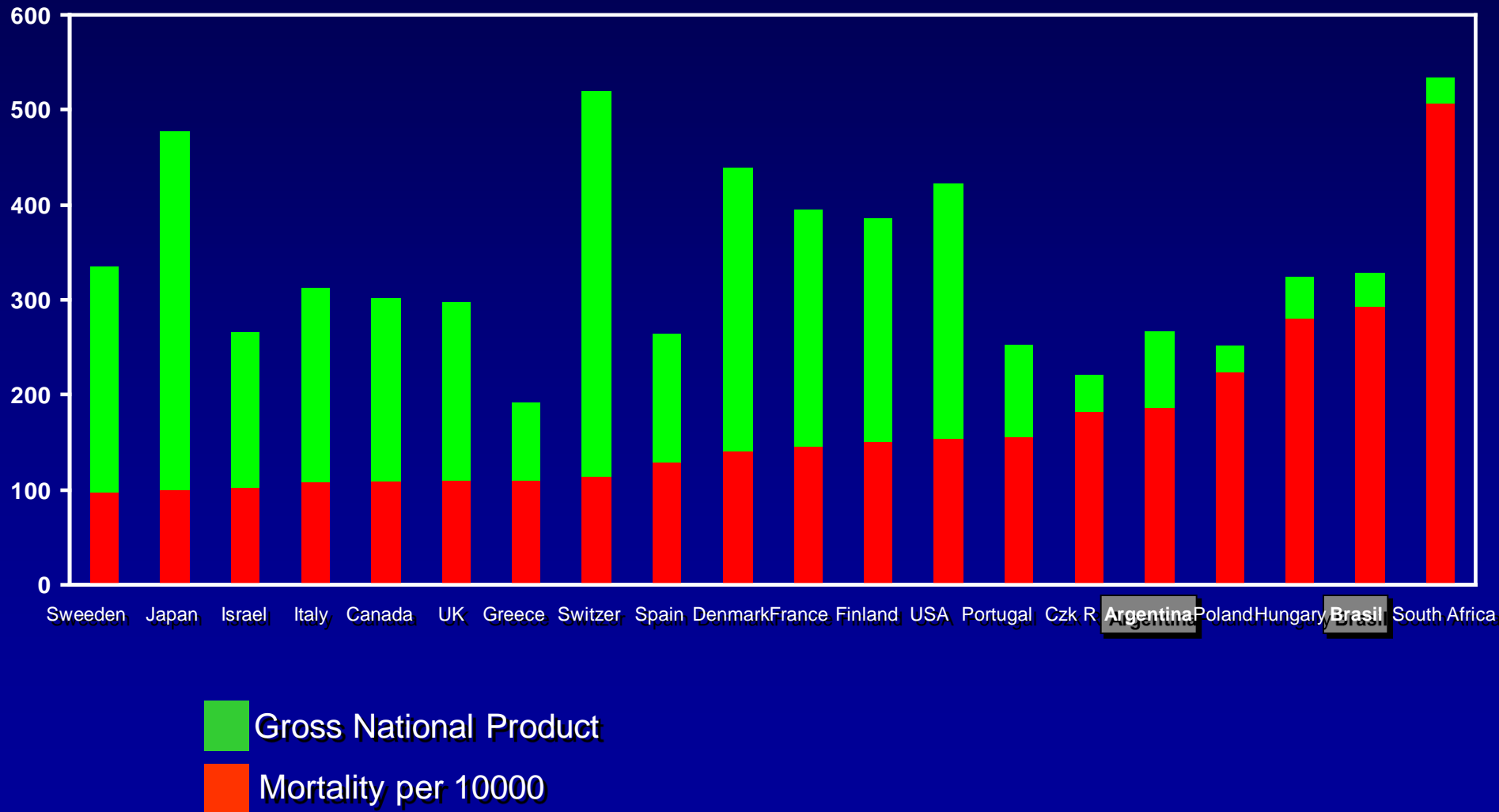
Display of physician
Motion Tracking Globes

Holographic Fusion & 3D
MULTI-IMAGE

Motion
Tracking Globes



Summary of GNP per Capita and Probability of Mortality at age 15-59 years per 1000 in Several Countries



Human Resources in Cardiovascular Medicine*

Where is the difference?

Region	Cardiologists	Surgeons	Residents	Nurses
Spain	51.2	6.4	7.5	12.5
Germany	22.6	1.5
USA	69.4	9.4
Latin America	65.0	5.0	6.99	5.06
Africa and Asia	2.1	0.93	0.46	1.67

*per million in habitants

From practice



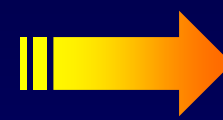
Evidence



From evidence



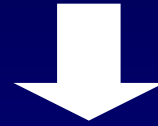
Practice



From evidence

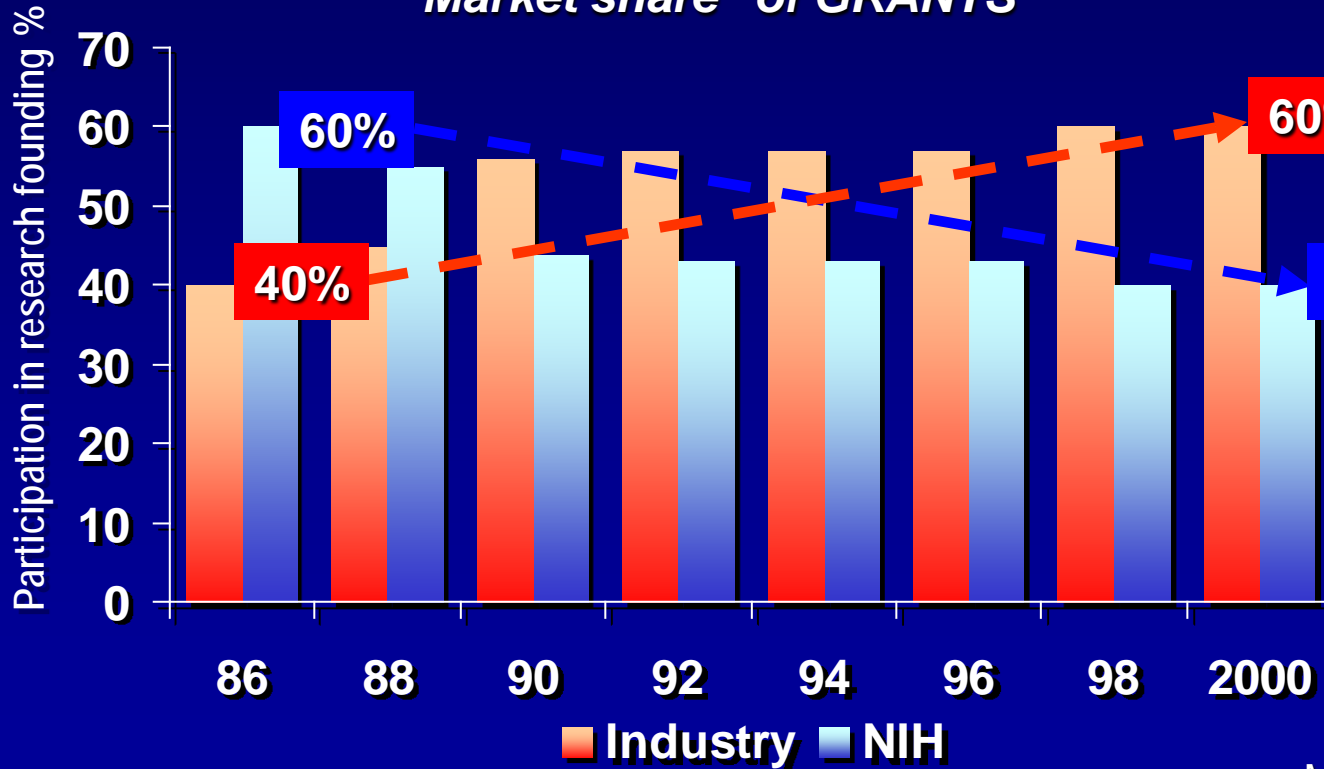


Practice



Real world
(including \$)

"Market share" of GRANTS



Cómo aprender las tareas del futuro

"Los diez trabajos que más demanda tendrán en 2010 no existían en 2004." La declaración de Richard Riley, ex secretario de Educación de Estados Unidos, es apabullante.

"Los diez trabajos que más demanda tendrán en 2010 no existían en 2004." La declaración de Richard Riley, ex secretario de Educación de Estados Unidos, es apabullante.

Aunque tal vez este vaticinio no se cumpla, la realidad del mundo laboral obliga a repensar la educación.

Supongamos el caso de un alumno que comenzó su carrera universitaria en 2004 y egresó en diciembre de 2008. Cuando empezó sus estudios no existían Facebook, YouTube, Flickr, Digg y Twitter. MySpace y Wordpress acababan de nacer. Hoy, tras cinco años y una carrera universitaria, el mundo es diferente. De aquí a cinco años, será más distinto aún.

Notas *vive!*



CÓMO APRENDER LAS TAREAS DEL FUTURO

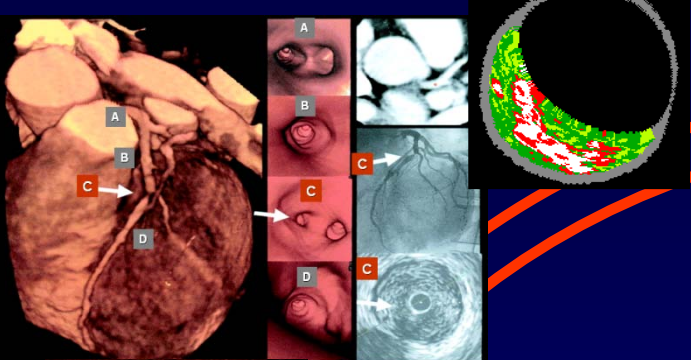
NO EXISTEN CARRERAS PARA MUCHOS DE LOS TRABAJOS DE MAYOR DEMANDA EN LOS PRÓXIMOS AÑOS

Fecha de Publicación: 06/03/2009 | [Cultura](#)

Los diez trabajos que más demanda tendrán en 2010 no existían en 2004. La declaración de Richard Riley, ex secretario de Educación de Estados Unidos, es apabullante.

Aunque tal vez este vaticinio no se cumpla, la realidad del mundo laboral obliga a repensar la educación.

Cardiólogo Intervencionista



Imágenes



Diabetes



Salud Pública



Valvulopatías



Cardiopatía congénita el adulto



Insuficiencia

Biología Molecular



Cardiopatías Isquémicas

Berrocal D et al.

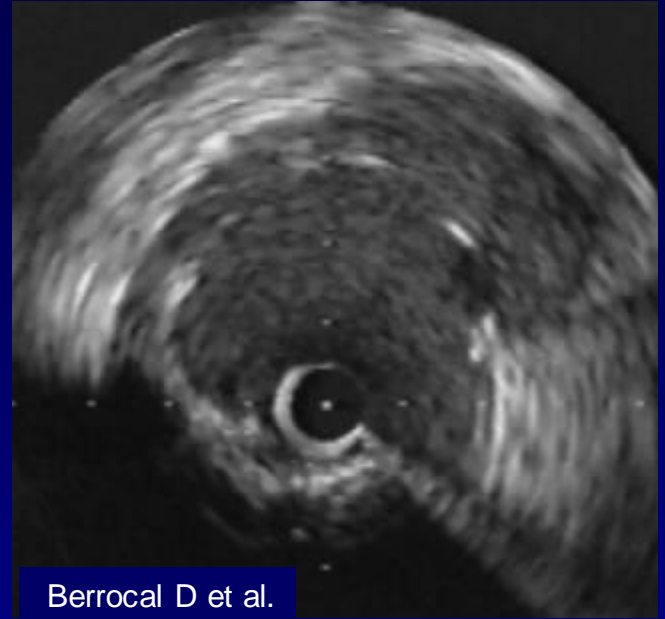
Berrocal D et al.

Farb A et al.

Farb A et al.



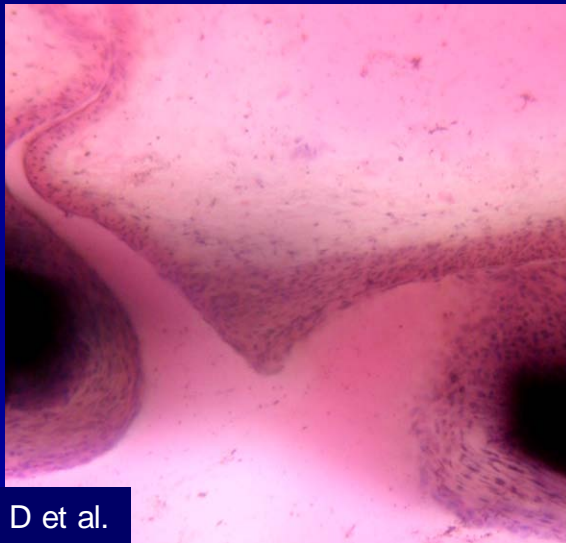
Berrocal D et al.



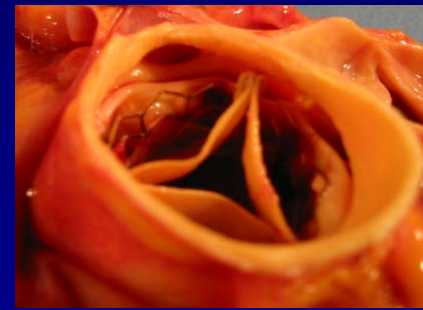
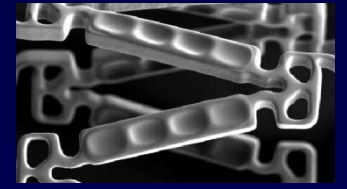
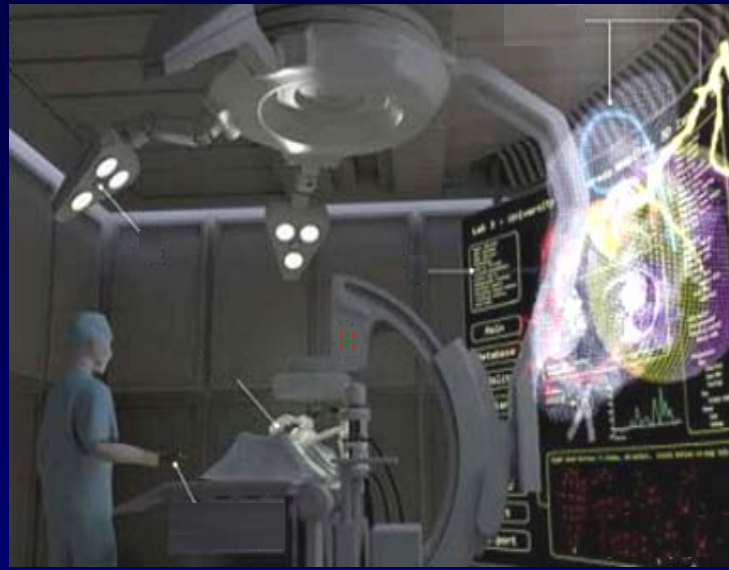
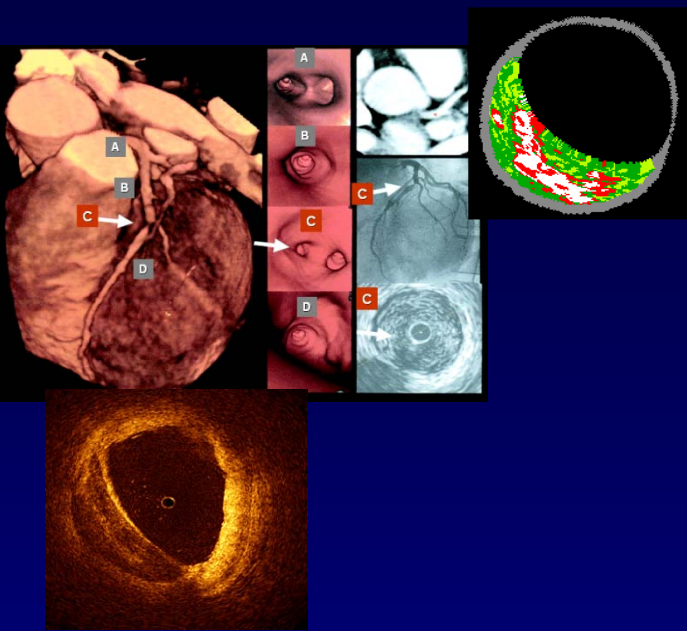
Berrocal D et al.



Berrocal D et al.



Courtesy A. Aizaid



TECNOLOGIA
'CONOCIMIENTO de la técnica'

**“Las especialidades no son estáticas,
sino dinámicas,
fluctuantes e interactúan unas con otras.
Los conocimientos se cruzan de áreas”**

Michael Mack. *President of the STS (Society of Thoracic Surgery)*
Bruce Lytle *Director of CCF (Cleveland Clinic Foundation)*
2005

TCT FOR SURGEONS

A Future Vision for the Integration of Cardiac Surgery and Interventional Cardiology

Co-sponsored by the Society of Thoracic Surgeons

8:00 AM-12:15 PM
Room 206

Session I. Twenty-First Century Imperatives

Moderator: Michael J. Mack

Discussants: David P. Faxon,
David R. Holmes Jr, Craig R. Smith,
David Taggart, Martyn R. Thomas,
David O. Williams

8:00 AM - Vision Statement: The Time Has Come for Integration of Cardiac Surgery and Interventional Cardiology!

David Taggart, Martyn R. Thomas

8:10 AM - Reality Statement: What Has Historically Kept the Specialties Apart, and What Challenges Exist to Integration?

David R. Holmes Jr, Michael J. Mack

8:20 AM - Discussion with Audience Q&A: Is True Integration of the Subspecialties Desirable, Inevitable, or Just Wishful Thinking?

Session II. A View from the Top: Workforce

8:00 AM - Vision Statement: The Time Has Come for Integration of Cardiac Surgery and Interventional Cardiology!

Craig R. Smith

8:35 AM - Society of Thoracic Surgery (STS Perspectives)

Michael J. Mack

8:45 AM - American College of Cardiology

8:10 AM - Reality Statement: What Has Historically Kept the Specialties Apart, and What Challenges Exist to Integration?

9:05 AM - American Heart Association (AHA Perspectives)

Alice K. Jacobs

9:15 AM - Society for Cardiovascular Angiography and Interventions (SCAI Perspectives)

8:20 AM - Discussion with Audience Q&A: Is True Integration of the Subspecialties Desirable, Inevitable, or Just Wishful Thinking?

Session III. Integrated Approaches, Lessons Learned

Ruediger Lange

Foundation

9:30 AM - Miami Cardiovascular Institute
Ramon Quesada

10:00 AM - Vanderbilt Heart and Vascular Institute
David X. Zhao

Foundation for Training the Next Specialist
Lars Svensson,

Ernst B. Bavaia,

William F. Fearon, Ruediger Lange,
Kishore Harjai, Sanjay A. Samy,
W. Douglas Weaver, Mathew Williams

11:12 AM - European Perspectives
Keith A. Fox

11:20 AM - European Surgical Perspectives

World Experiences

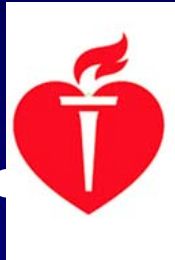
Experiences from a Cross-Trained Cardiovascular Specialist

11:44 AM - Training Cardiac Surgeons in Interventional Cardiology: The Guthrie Health System Experience
Kishore Harjai, Sanjay A. Samy



TCT2010

TRANSCATHETER CARDIOVASCULAR THERAPEUTICS 2010
THE WORLD'S PREMIER EDUCATIONAL EXPERIENCE



Cardiovascular “Invaders”

1. Cirujanos cardiovasculares
2. Cardiólogos Intervencionistas
3. Radiólogos Intervencionistas

QUIEN ESTA CAPACITADO PARA...?

1. Diagnosticar mejor
2. Resolver mejor
3. Acertar mas en su visión a futuro
4. Administrar mejor los recursos

QUIEN REPRESENTA LA MEJOR OPCION PARA LA GENTE?

Obstáculos

1. Mentalidad
2. Nadie puede saber y hacer **todo**
3. Programas de formación
4. Acreditación
5. Afrontar casos muy difíciles quirúrgicos o endoluminales en el futuro

ESTRATEGIAS

1. Unificar residencias
2. Training post residencia
3. Training “ad hoc” para determinadas practicas (TAVI, AAA)

Formación BÁSICA para el futuro especialista en intervenciones cardiovasculares

- Medicina Interna 1 año
- Cardiología Clínica 3 años
- Cardiología Intervencionista 3 años
- Cirugía General 4 años
- Cirugía Cardiovascular 3 años

TOTAL

14 años

Numero mínimo de procedimientos anuales para mantener 'expertise'

• Cateterismos Diagnósticos	500/año	45'	22500'
• Angioplastias coronarias	75/año	120'	9000'
• Angioplastias periféricas	50/año	180'	9000'
• Angioplastias carotideas	35/año	90'	3150'
• Terapéutica de estructurales	25/año	90'	2250'
• TAVI	10/año	210'	2100'
• Endoprótesis aórticas	25/año	180'	4500'
• Cirugías coronarias	75/año	210'	15750'
• Cirugías valvulares	40/año	180'	7200'
• Cirugías aórticas	50/año	150'	7500'
• Cirugías carotideas	30/año	90'	2700'
• Cirugías periféricas	50/año	120'	6000'
• TOTAL	965/año		91.650' (1527,5 horas)

1 año \Rightarrow 248 días laborables

Vacaciones \Rightarrow 20 días

1527,5 horas

+

2hs. Intervalo entre casos día x 228 días laborables (456hs)

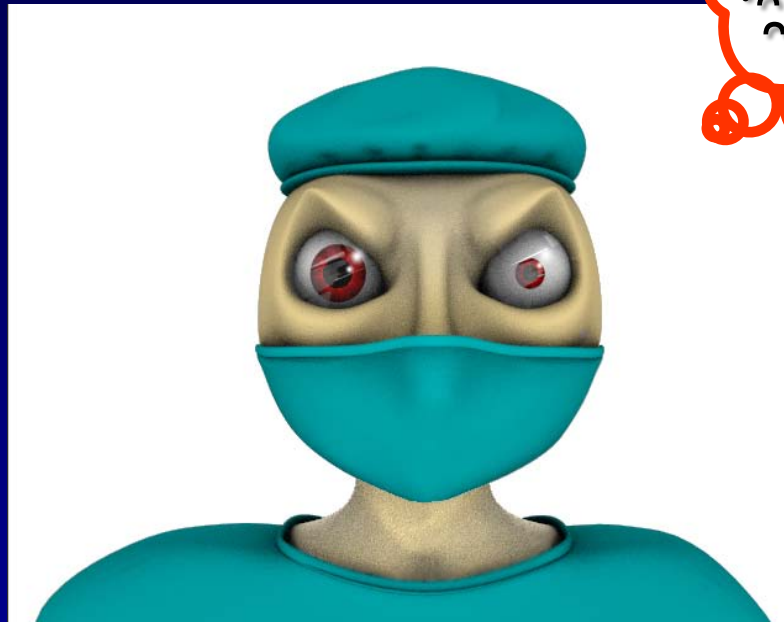


1983,5 horas



8.7 horas diarias

The new Cardiovascular invader!!!!



Tiene cerca de 40 años
Su cabeza no da mas!!
No es experto en NADA!!
No consigue trabajo!!!!!!

INTEGRAR A TRAVES DE PROYECTOS

1. TAVI
2. AAA
3. Disección aórtica
4. Isquemia aguda de MMII
5. “Híbridos”

PATIENT CENTERED CARE

INTEGRACION

Geográfica

Asistencial Científica

Research

the best way to integrate, ever

INTEGRAR A TRAVES DE PROYECTOS

PATIENT CENTERED CARE

DISEASE
CENTERED

PROCEDURE
CENTERED

TECH & DEVICES
CENTERED



NAVY SEALS

“Expertise and strength
Resides in

TEAM”

Definir y entrenar diferentes roles
y funciones en el TEAM
NO TODOS pueden hacer TODO!

CLAVES PARA EL EXITO

1. Co-Liderazgo
2. Comunicación continua y fluida
3. Resolución precoz de los conflictos
4. Compartir economía
5. “Cajas” separadas (SIC)
6. Evaluación pre
7. Evolución compartida
8. Consensuar todo

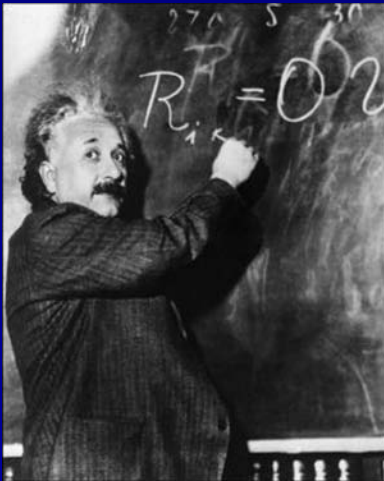
DEJAR DE DISCUTIR ‘QUIEN ES EL MEJOR PARA QUE’ Y
CONSTRUIR CON EL APORTE DE ‘LO MEJOR DE CADA UNO’

DESAFIOS

1. Cambio de “mentalidad”
2. Programas educativos dinámicos
3. Adaptabilidad de los nuevos especialistas a otras instituciones
4. Adaptabilidad de los nuevos especialistas a otras realidades geográficas, sociales, culturales y económicas
5. Pérdida de los “EXPERTOS”?
6. Certificación y acreditación
7. Racionalización de las prácticas

Crisis (del latín *crisis*, a su vez del griego κρίσις) es un conjunto de **cambios** en cualquier parte de una realidad organizada pero **inestable** y **sujeta a evolución** que genera **conflictos** y **oportunidades**

En la realidad actual la **crisis** es un **estado permanente**



“Solamente en las épocas de crisis, la imaginación es mas importante que el conocimiento”

DESAFIOS PARA EL FUTURO DE LA CARDIOLOGIA INTERVENCIONISTA



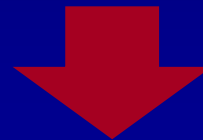
Integración de los conocimientos

Programas de educación médica dinámicos

Reformular exigencias y costos de la investigación

Financiación de la salud

Lograr sinergias entre especialistas



PACIENTE



HOSPITAL ITALIANO
de Buenos Aires

*Instituto de Medicina
Cardiovascular*

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Jefe de Cardiología Intervencionista
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