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GUVERNUL ROMÂNIEI



Fondul Social European
POSDRU 2007-2013



Instrumente Structurale
2007-2013



GUVERNUL ROMÂNIEI
MINISTERUL MUNCII, FAMILIEI,
PROTECȚIEI SOCIALE
ȘI PERSOANELOR VÂRSTNICE
OIRPOSDRU REGIUNEA CENTRU



UNIVERSITATEA DE MEDICINĂ ȘI
FARMACIE "CAROL DAVILA"
BUCUREȘTI

AD-COR Program inovativ de formare in domeniul cardiologiei pediatrice POSDRU/179/3.2/S/152012

Data: 09-11-2015

MODUL TEORETIC

Adult Congenital Heart Disease

Imputernicit: Prof. Dr. Tammam Youssef

Activitate prestata de I.R.C.C.S. POLICLINICO SAN DONATO – MILANO, ITALIA in
baza contractului nr. 18/22144/29.07.2015



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Acest material a fost documentat/ validat/ prezentat la sesiunile de formare în cadrul proiectului „AD-COR Program inovativ de formare în domeniul cardiologiei pediatrice” - POSDRU/179/3.2/S/152012, proiect cofinanțat din Fondul Social Operațional Sectorial Dezvoltarea Resurselor Umane 2007-2013.

Beneficiar: Universitatea de Medicină și Farmacie „Carol Davila” București

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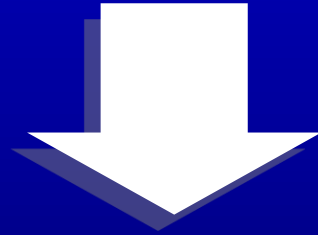
Adult Congenital Heart Disease

Alessandro Frigiola
Tammam Youssef

Policlinico San Donato
Milano

Incidenza Cardiopatie Congenite

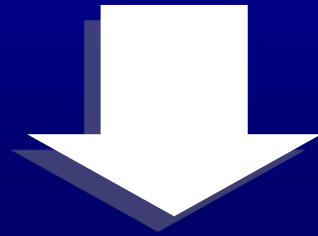
8 – 10 ogni 1000 nati vivi



in Italia circa 4000 cardiopatici/anno

Cardiochirurgia Pediatrica

**Notevoli e costanti progressi negli ultimi
25 anni fanno sì che oggi l'85% dei
cardiopatici congeniti raggiunge l'età
adulta**



Cardiopatici Congeniti Adulti

Cardiochirurgia

Mortalità

<i>Anno</i>	<i>Adulti</i>	<i>Bambini</i>
1960	30%	90%
1970	20%	70%
1980	10%	40%
1990	5%	10%
2000	4%	5%

Cardiopatie congenite nell'adulto



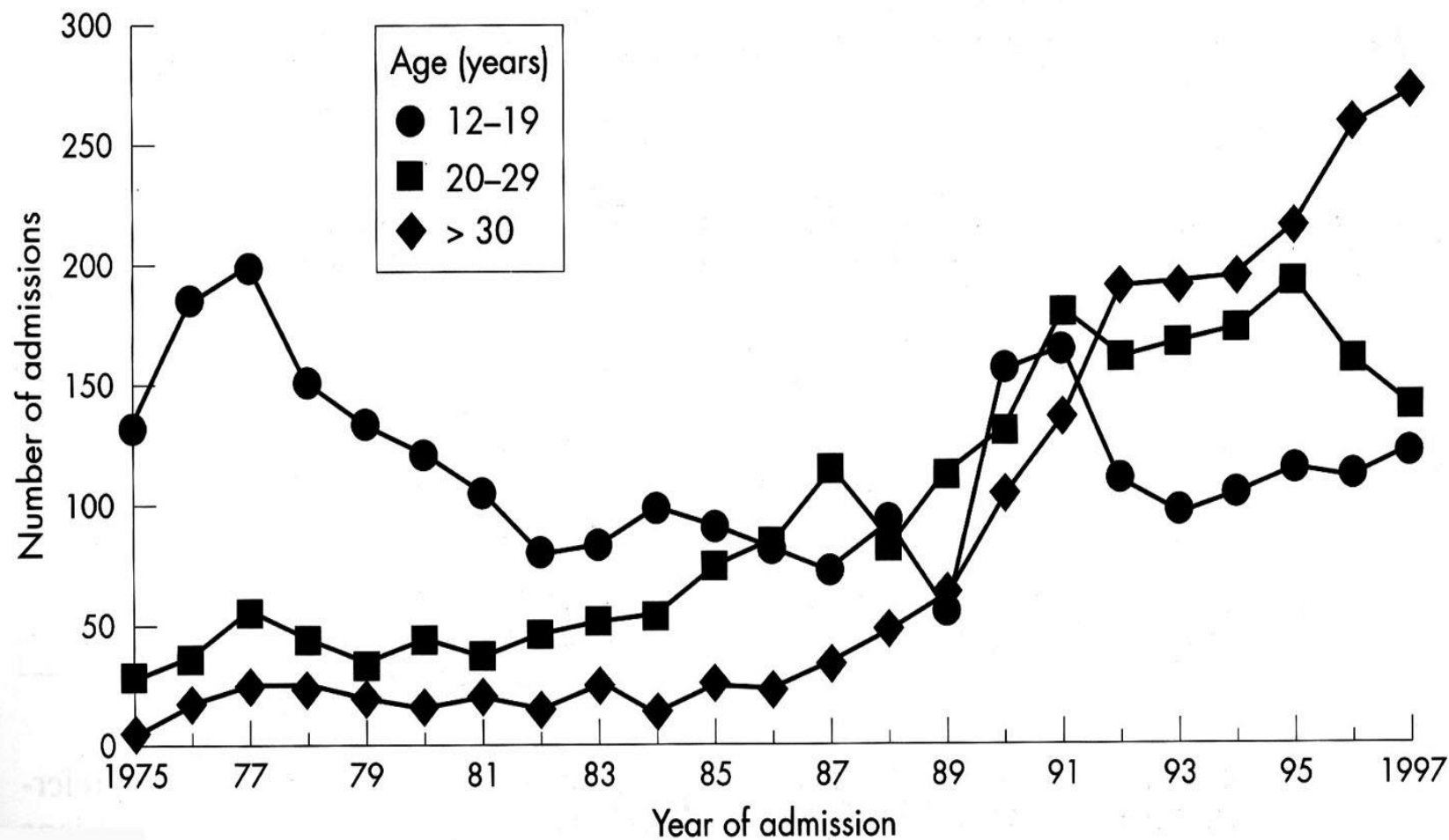
Esistono attualmente in Italia circa 80.000 cardiopatici congeniti che sono diventati adulti

Cardiopatici Congeniti Adulti

Acronimi

GUCH	Grown-up Congenital Heart
Disease	
CACH	Canadian Adult Congenital Heart
ACHD	Adult Congenital Heart Disease
BACH	Boston Adult Congenital Heart

Grown-up congenital heart disease



Adults with CHD

Interesting patient's population

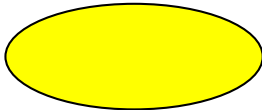
in term of:

- Increasing number of patients
- Changing types of patients

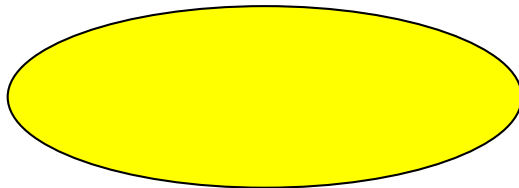


Workload in CHD

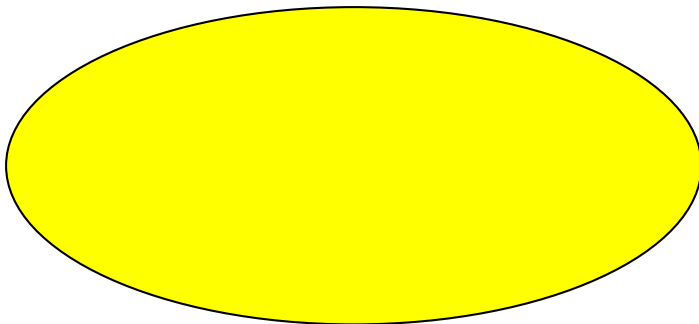
*ACHD
Pts numbers*



1980

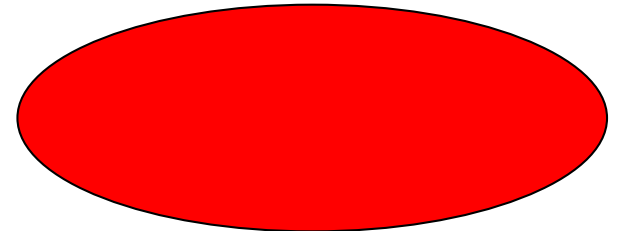
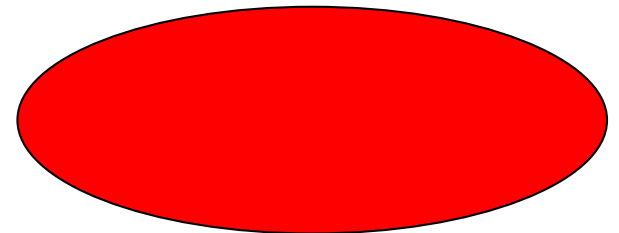
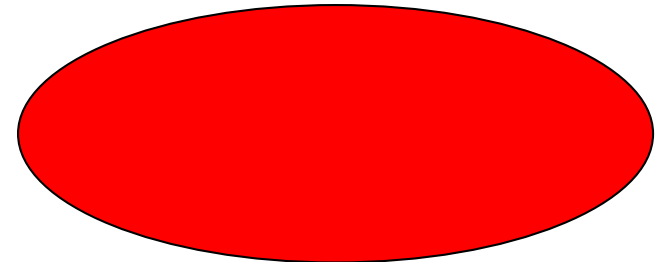


2000



2020

*Pediatric
Pts numbers*



G.Webb, Toronto



Si stima che vi siano oltre
75.000 di questi pazienti
attualmente in Italia e che
oltre 2000 pazienti adolescenti
ogni anno entrino nell'età
adulta

Adults with CHD

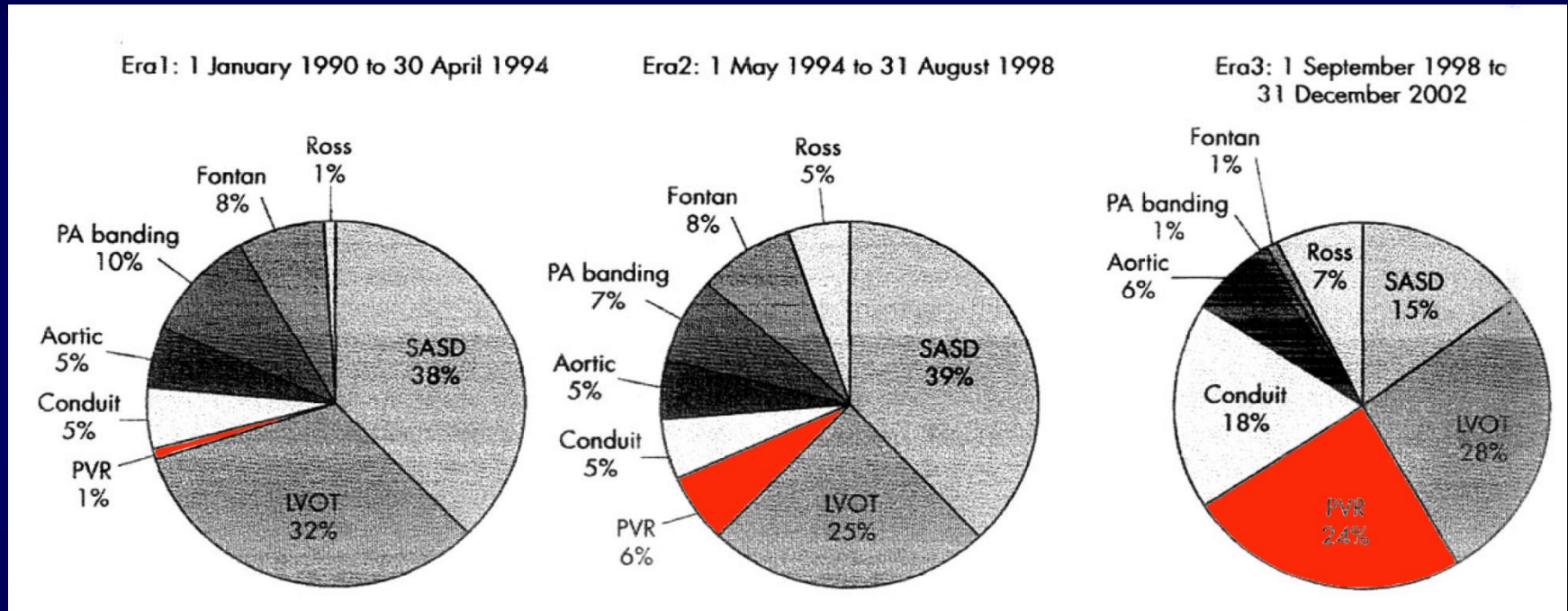
Interesting patient's population

in term of:

- Increasing number of patients
- Changing types of patients



SURGICAL PATIENTS EVOLUTION



Srinathan SK et al. Heart 2004; 91:207-12

INCREASING NUMBER OF PVI

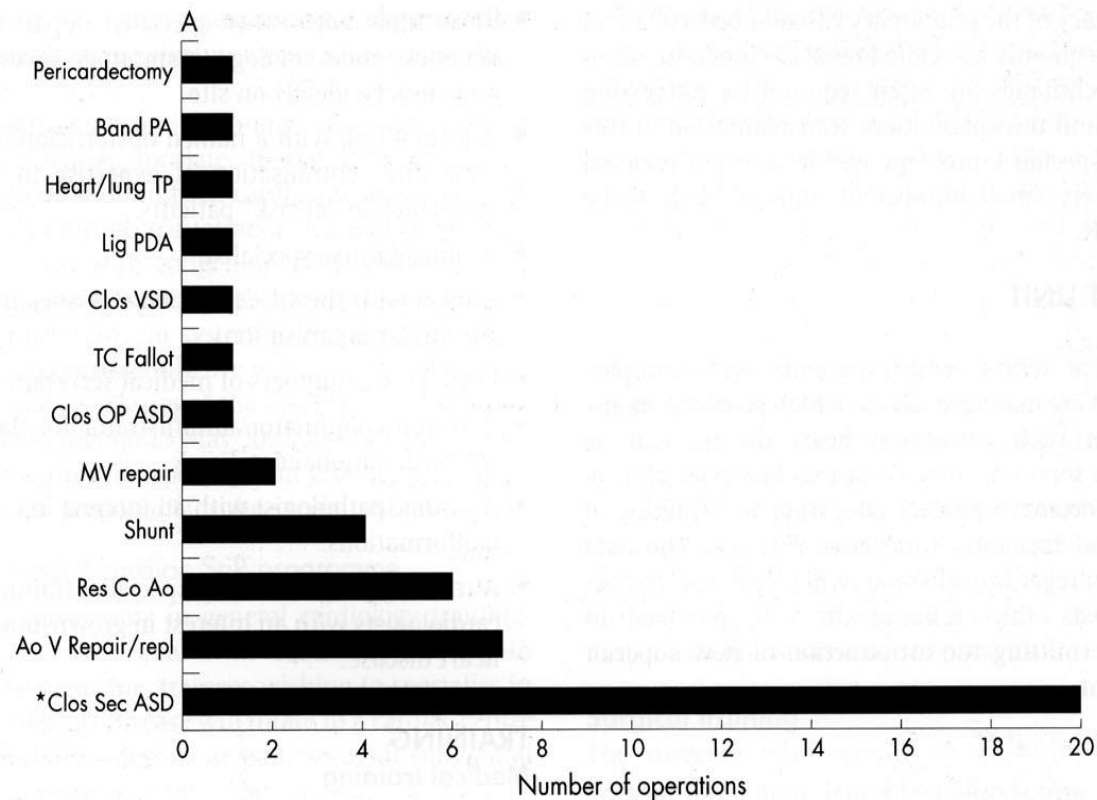
Dore et al ('97)	Berdat et al ('04)	Giamberti et al ('09)
LVOT/Ao 36%	LVOT/Ao 46%	PVI 25%
Cond repl 17%	PS 12%	LVOT/Ao 22%
Palliations 8%	PVI 11%	Cond repl 10%
Reco Ao 6%	Reco Ao 8%	Res ASD 8%
PVI 3%	Cond Repl 6%	Conv Fontan 7%
MVR/Repair 3%	MVR/Repair 6%	MVR/Repair 6%
Fontan 3%		TVR/Repair 4%
Res ASD 3%		Fontan 4%
		Palliation 4%
		Reco Ao 1,5%

Giamberti et al, Ann Thorac Surg 2009; 88: 1284-90

Cardiopatici Congeniti Adulti

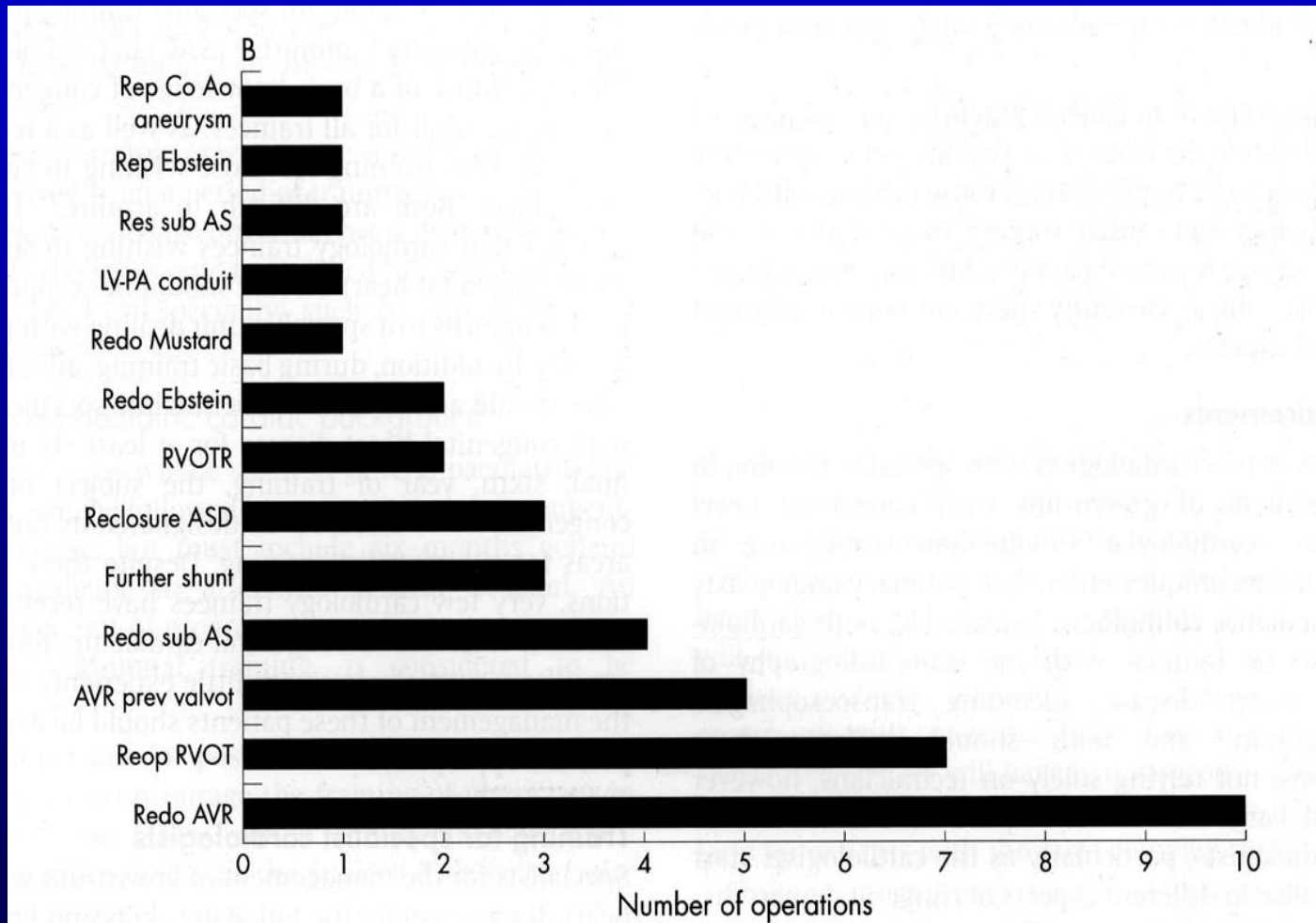
Tipologie interventi

Grown-up congenital heart disease



Cardiopatici Congeniti Adulti

Tipologie re-interventi



CARDIOPATIE CONGENITE PIU' FREQUENTI

THE CONGENITAL

CARDIAC CENTER FOR ADULTS, TORONTO

(1994)

- **ASD**
 - **VSD**
 - **PS**
 - **TOF**
 - **LVOTO**
 - **AOCO**
 - **PDA**
 - **EISENMENGER**
 - **TGA**
 - **AVSD**

La nostra attività

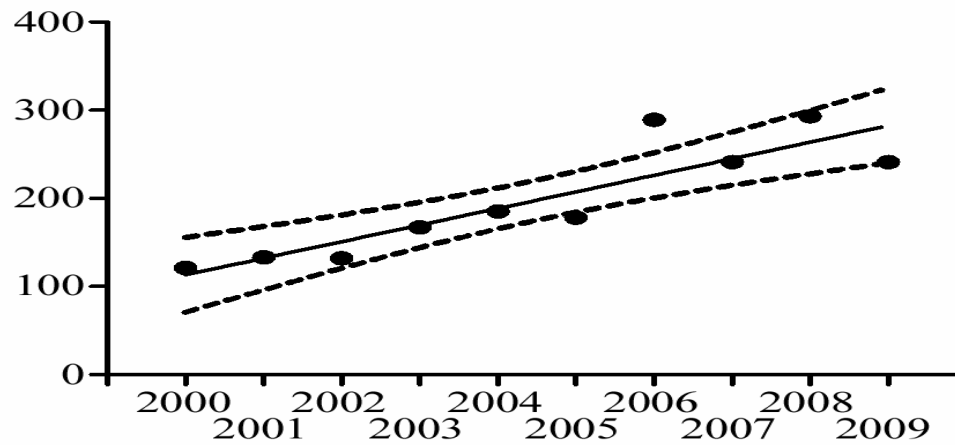
INCIDENCE OF SURGERY FOR ACHD

January 2000 – December 2011

N° CHD operated 4523

ACHD 995 (22%)

Reoperations 339 (34%)



2000



2011

Incremento costante dei pazienti in età adolescenziale e adulta che sono sotto posti a un cateterismo durante la loro degenza.

Adults with CHD

Interesting topics:

- Adults Tetralogy of Fallot
- Adults Fontan patients
- Arrhythmias



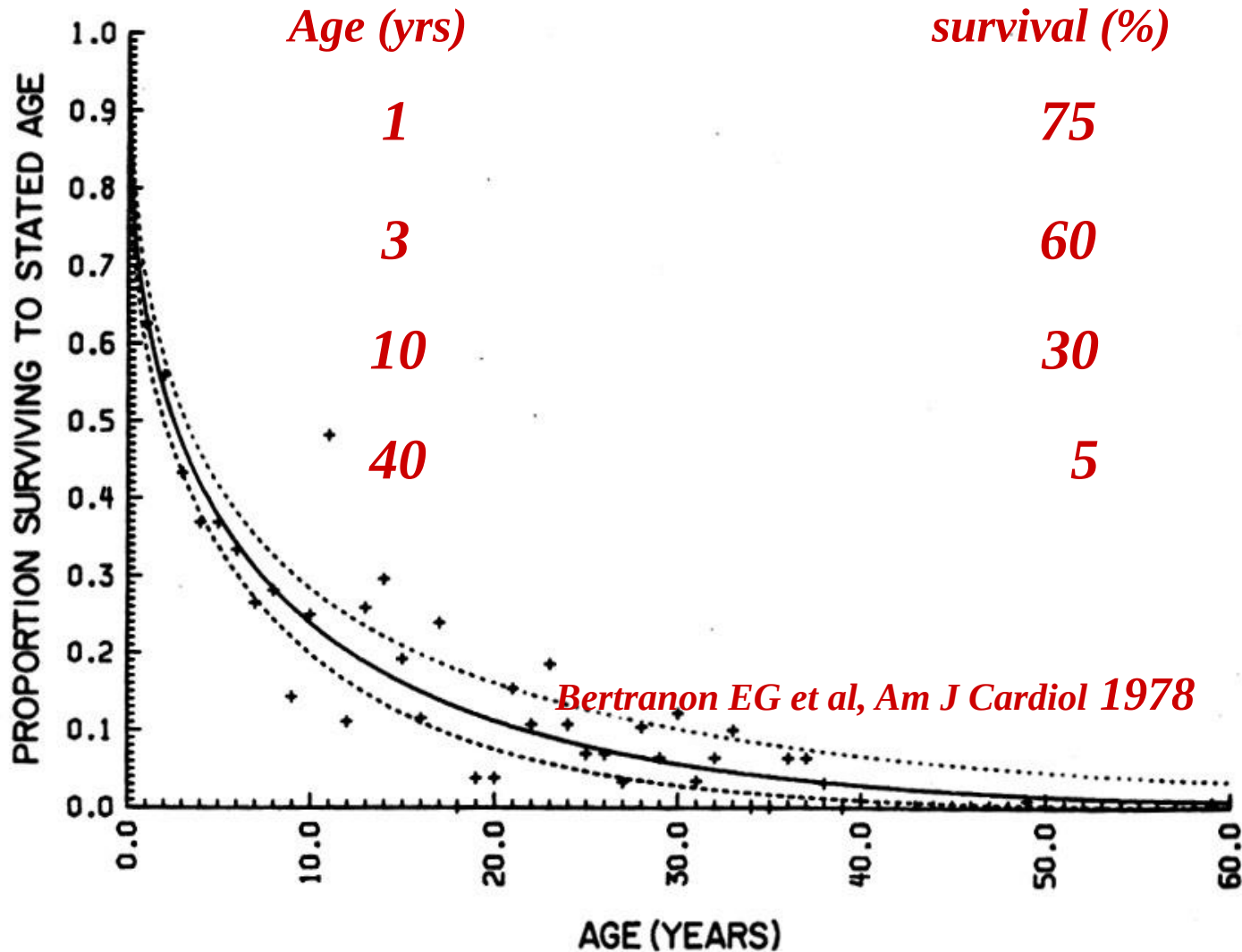
Adults with CHD

Interesting topics:

- **Adults Tetralogy of Fallot**
- **Adults Fontan patients**
- **Arrhythmias**



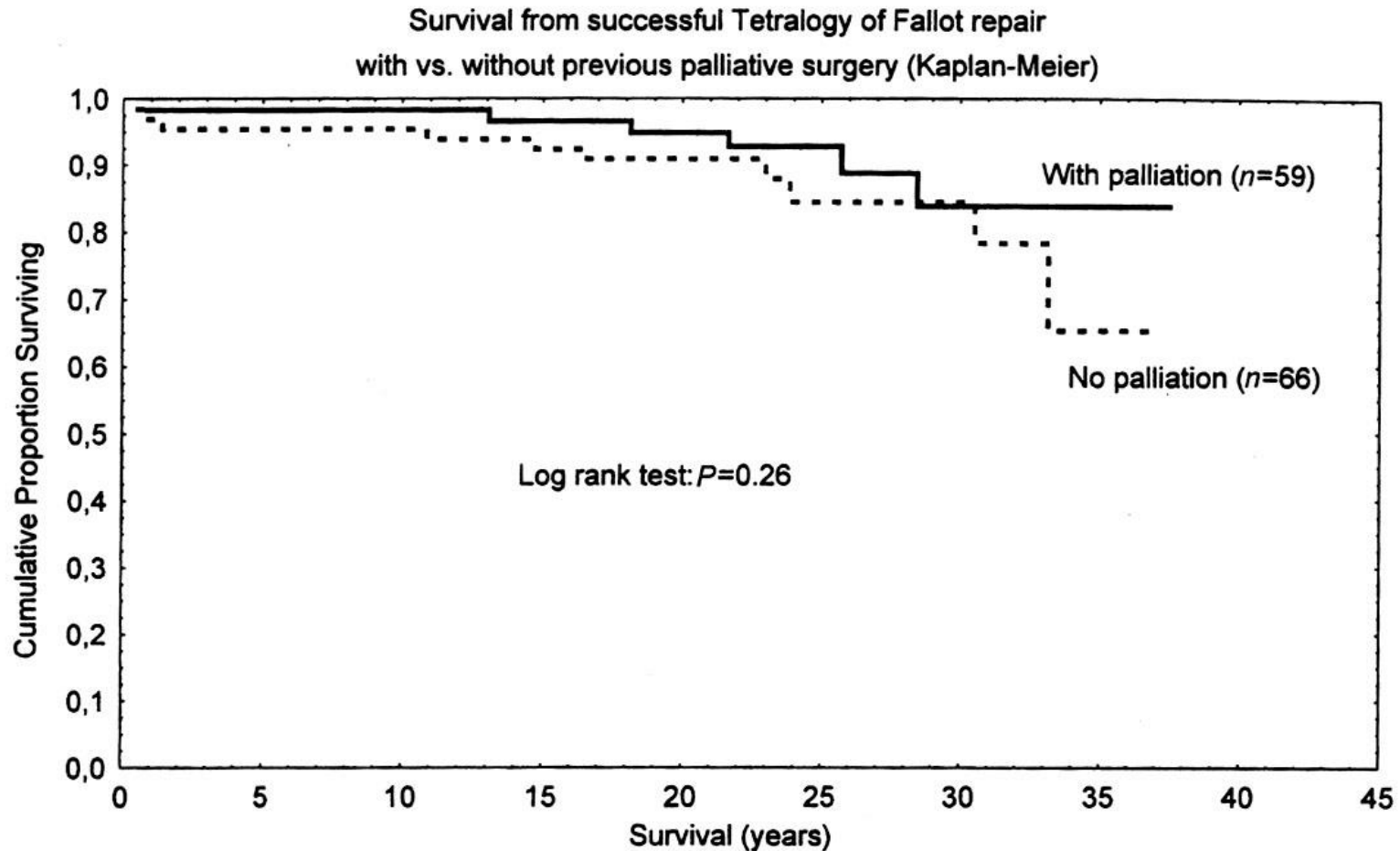
Natural history of TF



Surgical history of TF

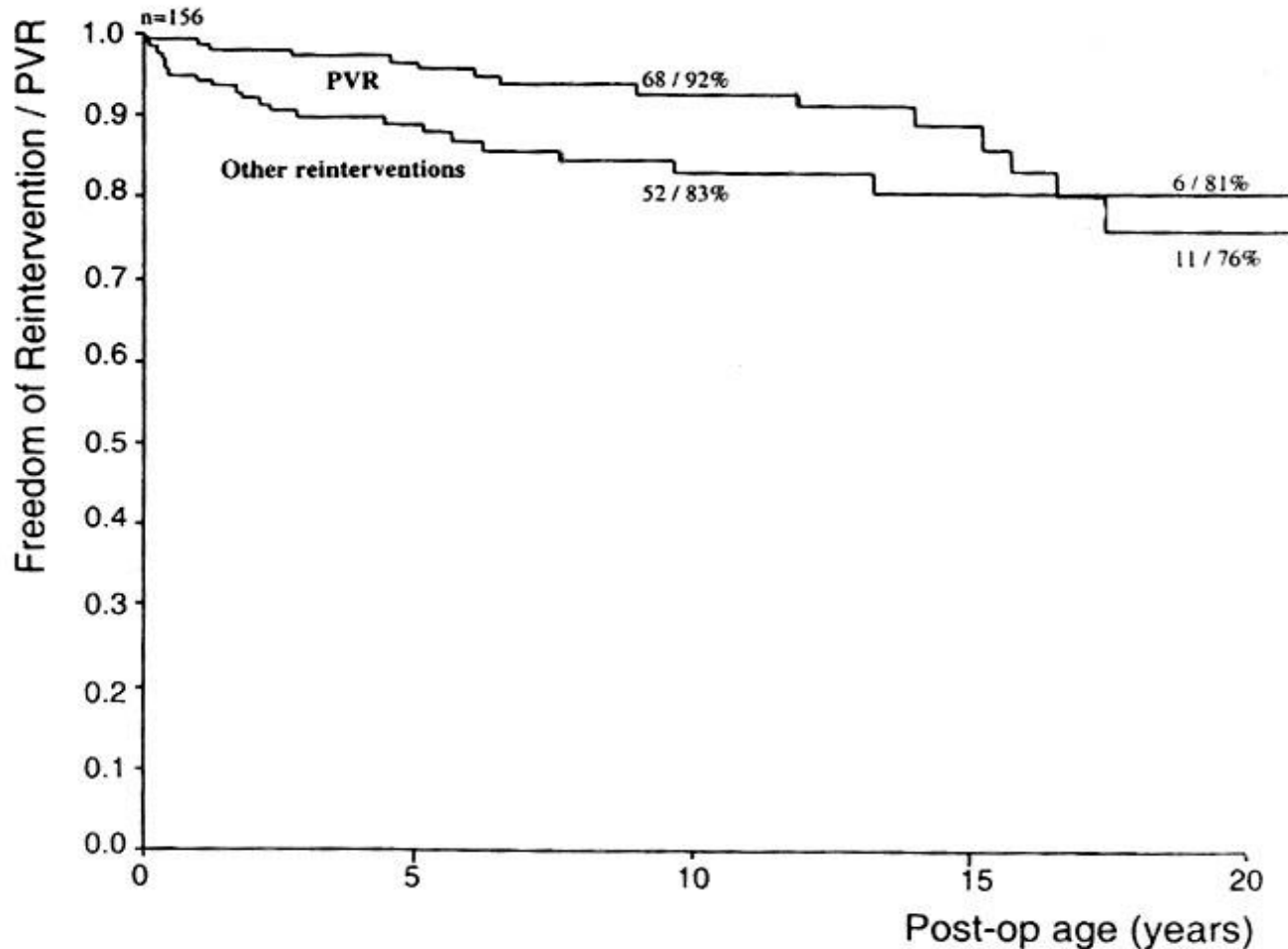
Survival

M.A. Nørgaard et al. / *European Journal of Cardio-thoracic Surgery* 16 (1999) 125–130



Surgical history of TF

Freedom from reintervention



REOPERATIONS IN ADULTS **AFTER RVOTO REPAIR**

- *Residual VSD*
- *Pulmonary stenosis*

PULMONARY REGURGITATION



Fundamental Scientific Contribution

Transcatheter Implantation of a Bovine Valve in Pulmonary Position A Lamb Study

Philipp Bonhoeffer, MD; Younes Boudjemline, MD; Zakhia Saliba, MD; Ana Olga Hausse, MD;
Yacine Aggoun, MD; Damien Bonnet, MD; Daniel Sidi, MD; Jean Kachaner, MD

Circulation. 2000;102:813-816

EARLY REPORT

Early report

**Percutaneous replacement of pulmonary valve in a
right-ventricle to pulmonary-artery prosthetic conduit with valve
dysfunction**

Philipp Bonhoeffer, Younes Boudjemline, Zakhia Saliba, Jacques Merckx, Yacine Aggoun, Damien Bonnet, Philippe Acar,
Jérôme Le Bidois, Daniel Sidi, Jean Kachaner

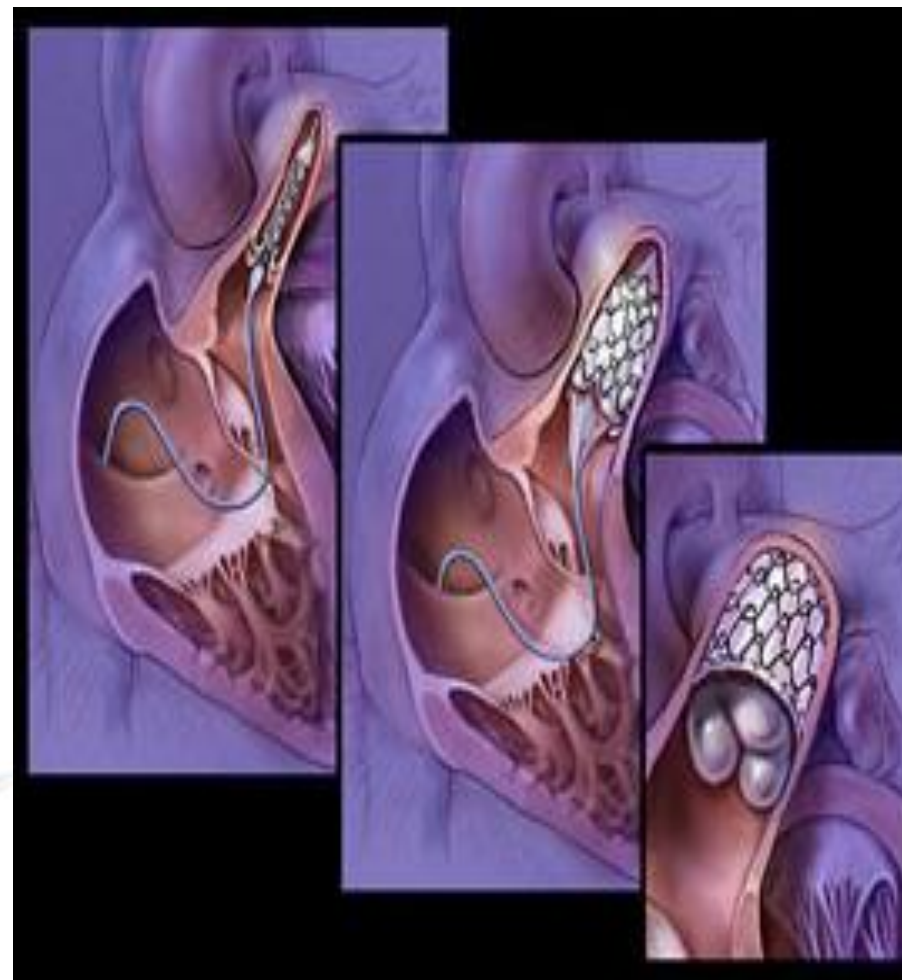
Lancet 2000; **356**: 1403-05



Dr. Philipp Bonhoeffer



The 12 years old first patient



The Melody Transcatheter PV

SURGICAL APPROACH OF THE RVOT

“The PVI for PVR is still the most frequent reoperation performed today despite the recent introduction of the transcatheter pulmonary valve”

Giamberti et al. Ann Thorac Surg 2009; 88: 1284-90

Why?

Limited indications

SURGICAL APPROACH OF THE RVOT

LIMITATIONS

for transcatheter PVI

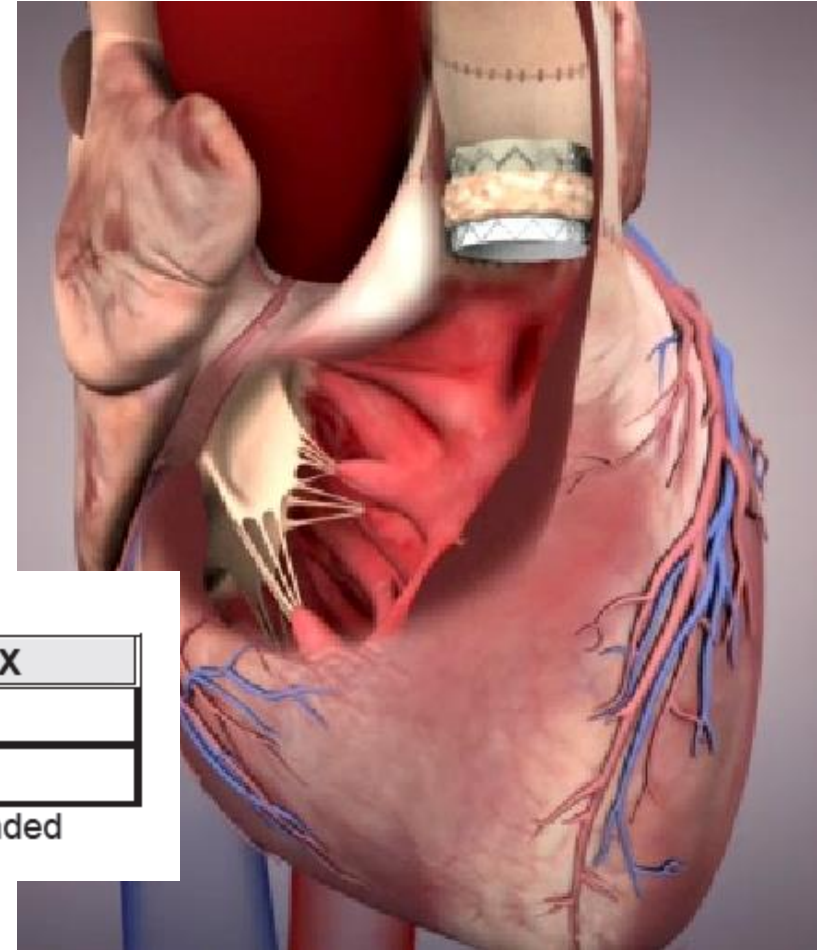
- ***Size of pulmonary annulus***
- ***Morphology of RVOT***
 - No RV-PA conduit***
 - No rigid support***
- ***Associated cardiac malformation***
 - RV aneurism***
 - TV regurgitation***
 - arrhythmias***



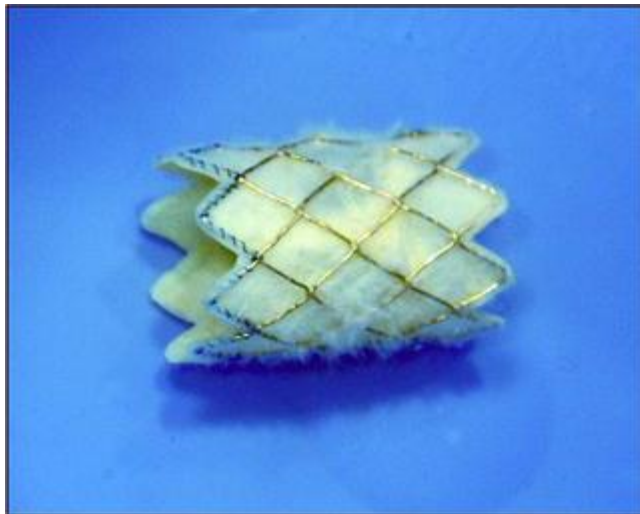
Stenotic Conduits

| Conduit During Balloon Predilatation (4-5atm) | 9000TFX |
|---|---------|
| Dilated Conduit Diameter 21 - 23 mm | 23 mm |
| Dilated Conduit Diameter 23.5 - 26 mm | 26 mm |

*Note for non-stenotic conduits, 10-15% oversizing is recommended

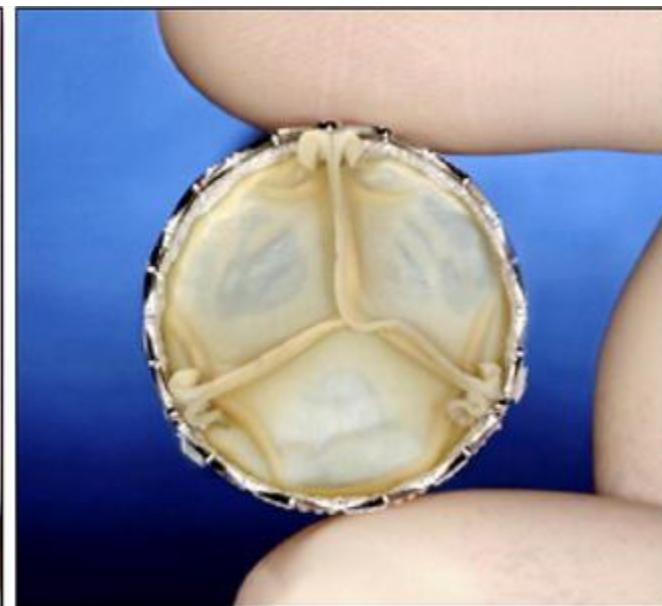


The Sapien Transcatheter PV



Melody

Sapien



SURGICAL APPROACH OF THE RVOT

“The indications for surgical pulmonary valve implantation are the same than for transcatheter pulmonary valve implantation”

Giamberti et al. Ann Thorac Surg 2009; 88: 1284-90

Pulmonary Valve Replacement timing

“The problem related to put a valve in the pulmonary position is to identify the correct time to do it.

When we should re-operate these patients?”

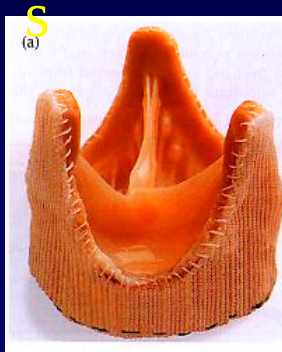
INDICATION GUIDE-LINES

- Symptoms
- Severe PVI (regurgitation fraction of $\geq 35\%$ on MRI)
- RV dilation (RVEDV $> 140\text{ml/m}^2$, RVEDV/LVEDV $\geq 1,4$ with symptoms or $\geq 2,0$ without symptoms)
- RV systolic pressure $\geq 2/3$ the systemic pressure with symptoms or $> 3/4$ without symptoms
- Impaired exercise capacity (peak oxygen consumption $\leq 65\%$ of predicted value)

PULMONARY VALVE IMPLANTATION

Mechanical

Stentles



Valved Conduit



IDEAL PULM VALVE?

Freestyle



Stented



Homograft



CRITERIA TO TAKE INTO CONSIDERATION

- ***Availability***
- ***Durability***
- ***Easy implantation***
- ***Facilitation of future
interventional procedures***

Biological Valve in RVOT

freedom from reoperation

| | 1 yrs | 3 yrs | 5 yrs | 10 yrs |
|--------------------------------|-------------|--------------|--------------|-------------|
| Shinkawa
T
2010 | 100% | 97.7% | 97.7% | |
| Kanter KR
2002 | | | | 100% |
| Yemetz M
1997 | | | | 85% |
| Fukada J
1997 | | | | 85% |

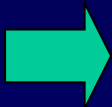
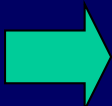
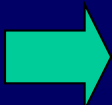
Porcine Bioprosthetic Valve in the Pulmonary Position: Mid-Term Results in the Right Ventricular Outflow Tract Reconstruction

**Alessandro Giamberti • Massimo Chessa • Matteo Reali •
Alessandro Varrica • Halkawt Nuri • Giuseppe Isgrò •
Alessandro Frigiola • Marco Ranucci**

Pediatr Cardiol. 2013 Jun; 34(5): 1190-3

BIOPROSTHETIC valve experience

Mean follow-up 52 mos (6-132 mos)

| | | |
|-------------------------------|---|--------------------------------|
| <i>N° pts</i> |  | <i>74</i> |
| <i>Mean NYHA</i> |  | <i>I (range I-II)</i> |
| <i>Mean RV-PA grad</i> |  | <i>19 mm Hg (2 pts)</i> |

100% FREEDOM FROM:

Valve related death; paravalvular leak; reoperation; thromboembolism; endocarditis; valve related mortality and morbidity; structural valve deterioration; pulmonary valve regurgitation.

PORCINE BIOPROSTHESIS



Advantages

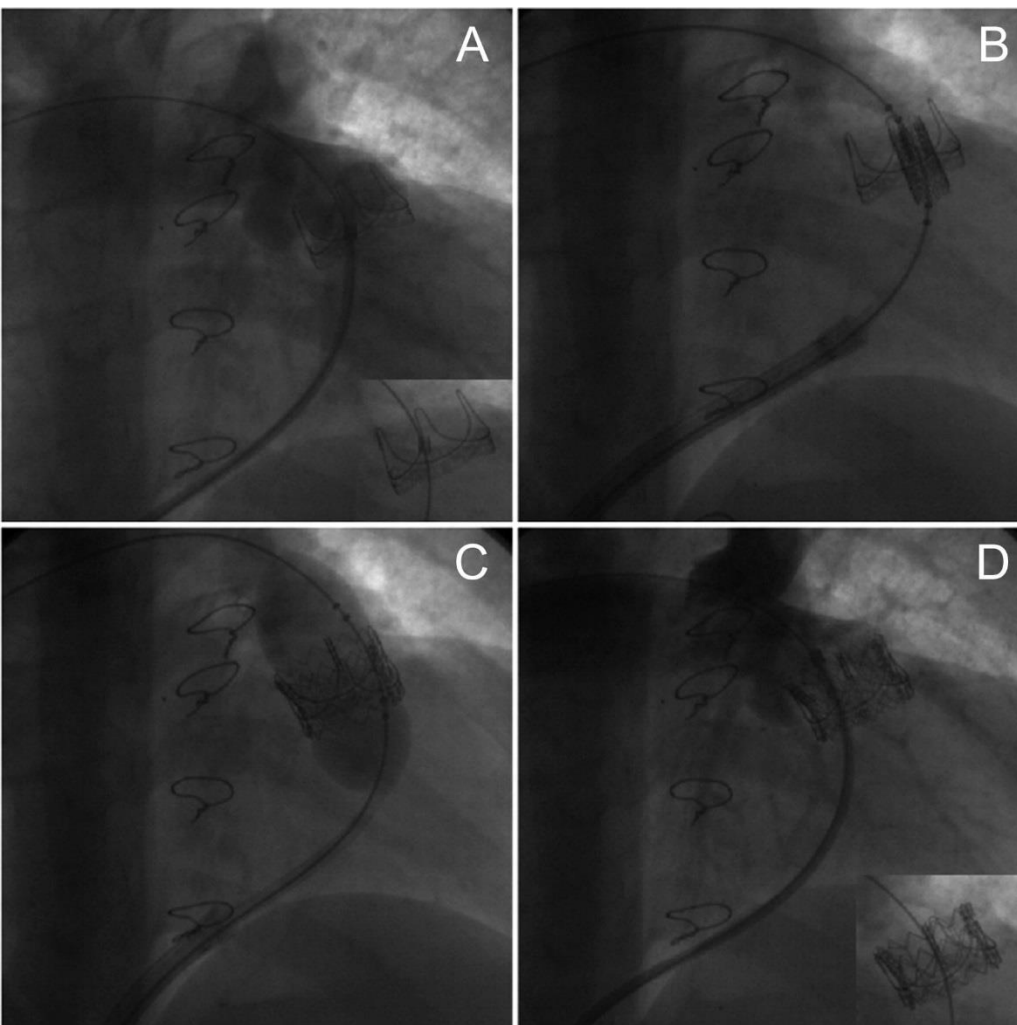
- ***DURABILITY (similar to other prosthesis)***
- ***AVAILABLE in all sizes***
- ***EASY to implant (minimal dissection!!)***
- ***NO need for anticoagulation therapy***
- ***NO risk of external compression***

PORCINE BIOPROSTHESIS



Advantages

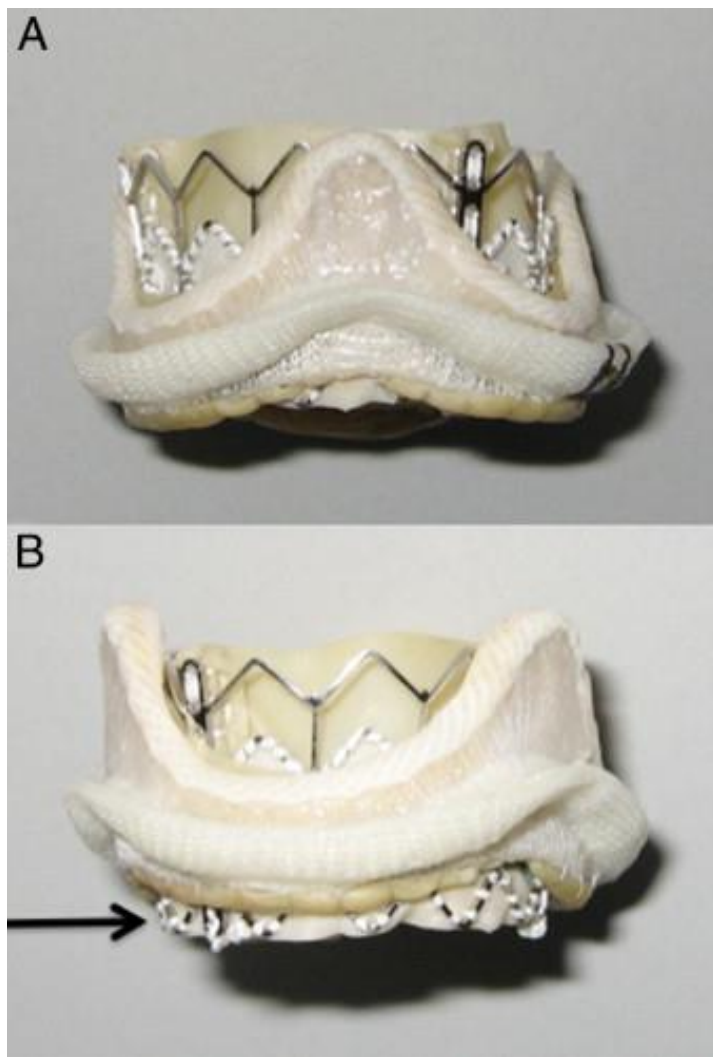
***GOOD RIGID SUPPORT FOR
FUTURE
TRANSCATHETER PV
IMPLANTATION***



Percutaneous implantation of an Edwards SAPIEN valve in a failing pulmonary bioprosthesis in palliated Tetralogy of Fallot

[Simon T. MacDonald,](#)
[Mario Carminati](#)
and [Gianfranco Butera*](#)

MacDonald S T et al. Eur Heart J 2011;eurheartj.ehq516



The “valve in valve” procedure

Circ Cardiovasc Interv. 2012 Dec;5(6):862-70. doi: 10.1161/CIRCINTERVENTIONS.112.972216. Epub 2012 Dec 4.

Melody valve implant within failed bioprosthetic valves in the pulmonary position: a multicenter experience.

Gillespie MJ, Rome JJ, Levi DS, Williams RJ, Rhodes JF, Cheatham JP, Hellenbrand WE, Jones TK, Vincent JA, Zahn EM, McElhinney DB.

Division of Cardiology, Children's Hospital of Philadelphia, Perelman School of Medicine, University of Pennsylvania, USA. gillespie@email.chop.edu

8 US Centers April 2007 – January 2012

104 patients

- . High rate of success***
- . Low procedure-related morbidity and mortality***
- . Excellent short-term results***

Adults with CHD

Interesting topics:

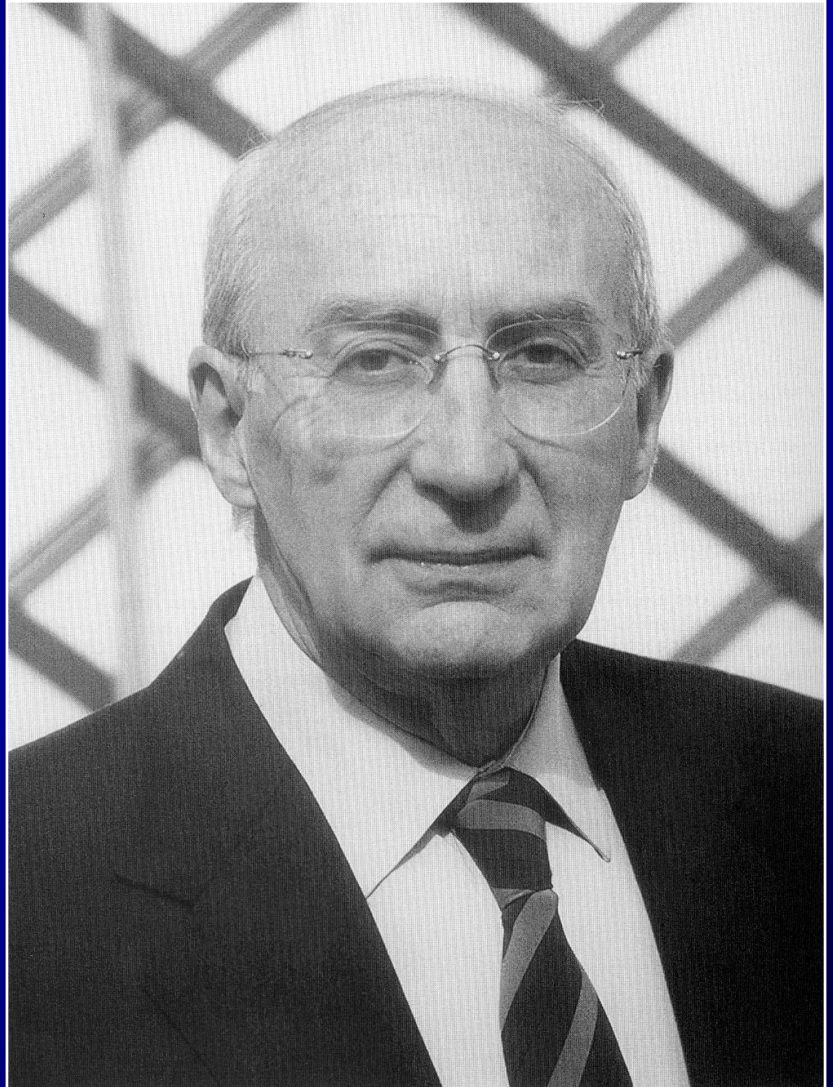
- Adults Tetralogy of Fallot
- Adults Fontan patients
- Arrhythmias



INTERVENTO di FONTAN

1968

Primo successo
chirurgico
FONTAN e BAUDET



Surgical repair of tricuspid atresia

F. FONTAN and E. BAUDET

Centre de Cardiologie, Université de Bordeaux II, Hôpital du Tondu, Bordeaux, France

Surgical repair of tricuspid atresia has been carried out in three patients; two of these operations have been successful. A new surgical procedure has been used which transmits the whole vena caval blood to the lungs, while only oxygenated blood returns to the left heart. The right atrium is, in this way, 'ventriclized', to direct the inferior vena caval blood to the left lung, the right pulmonary artery receiving the superior vena caval blood through a cava-pulmonary anastomosis. This technique depends on the size of the pulmonary arteries, which must be large enough and at sufficiently low pressure to allow a cava-pulmonary anastomosis. The indications for this procedure apply only to children sufficiently well developed. Younger children or those whose pulmonary arteries are too small should be treated by palliative surgical procedures.

Only palliative operations (systemic vein to pulmonary artery anastomosis; systemic artery to pulmonary artery anastomosis) have been performed in tricuspid atresia. Although these procedures are valuable, they result in only a partial clinical improvement, because they do not suppress the mixture of venous and oxygenated blood.

We have initiated a corrective procedure for

tricuspid atresia, which completely suppresses blood mixing. The entire vena caval return undergoes arterialization in the lungs and only oxygenated blood comes back to the left heart. This procedure is not an anatomical correction, which would require the creation of a right ventricle, but a procedure of physiological pulmonary blood flow restoration, with suppression of right and

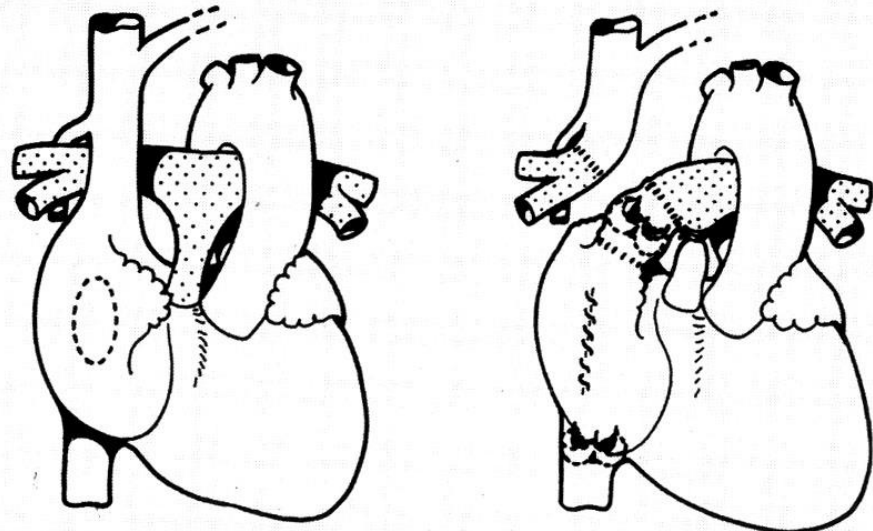
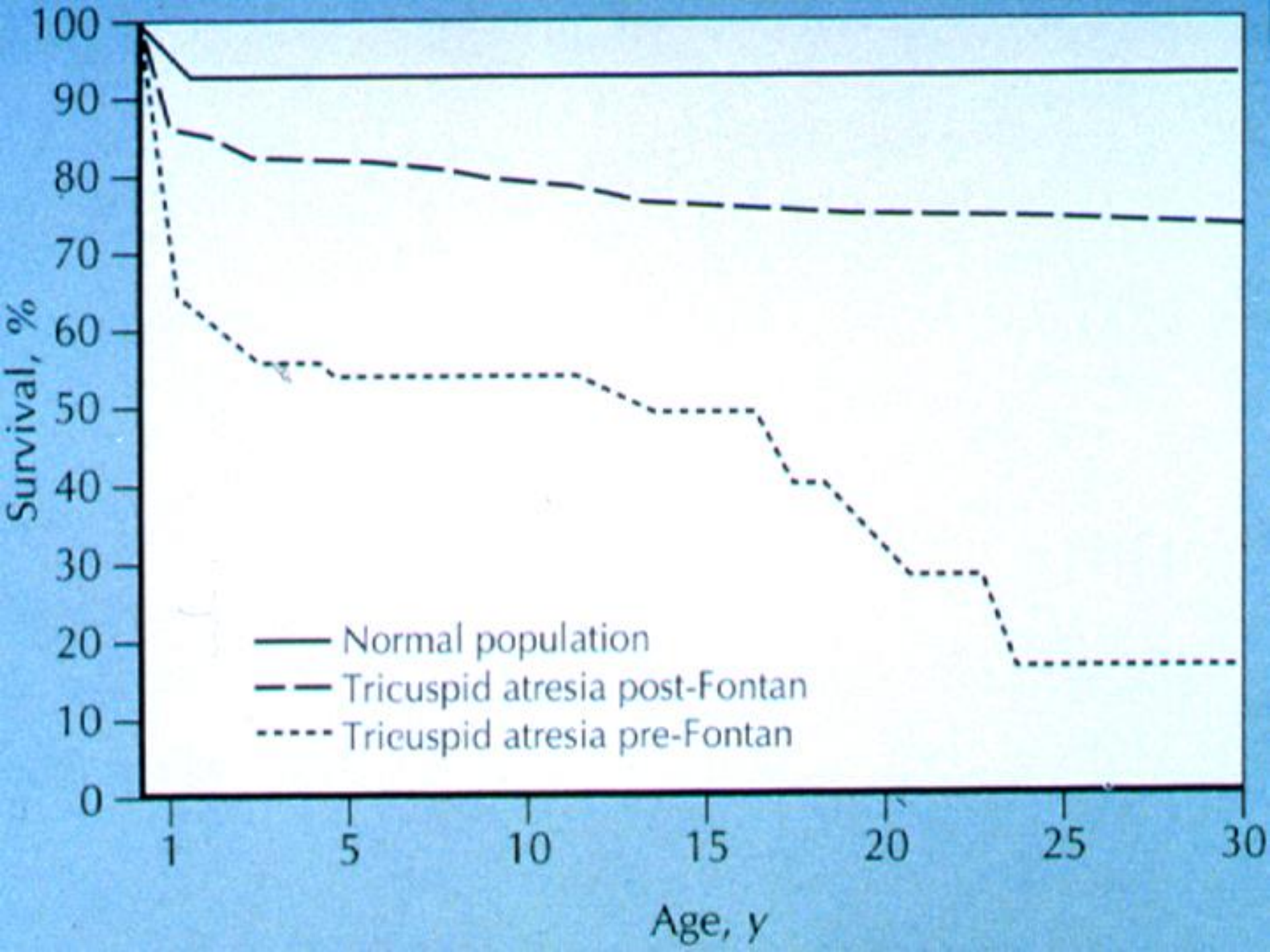
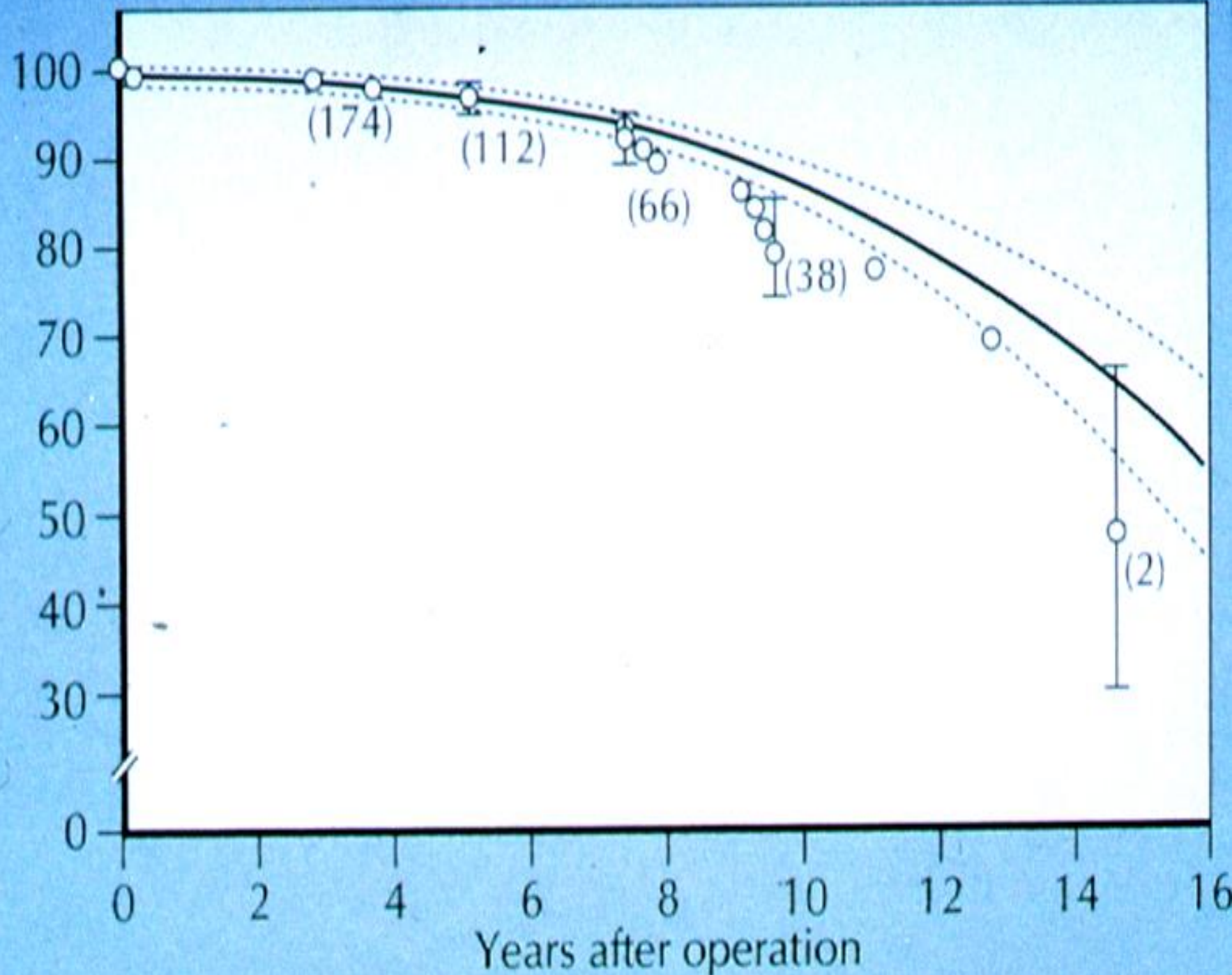


FIG. 1. Case 2. Tricuspid atresia type II B. Drawing illustrates steps in surgical repair: (1) end-to-side anastomosis of distal end of right pulmonary artery to superior vena cava; (2) end-to-end anastomosis of right atrial appendage to proximal end of right pulmonary artery by means of an aortic valve homograft; (3) closure of atrial septal defect; (4) insertion of a pulmonary valve homograft into inferior vena cava; and (5) ligation of main pulmonary artery.

INTERVENTO
di FONTAN

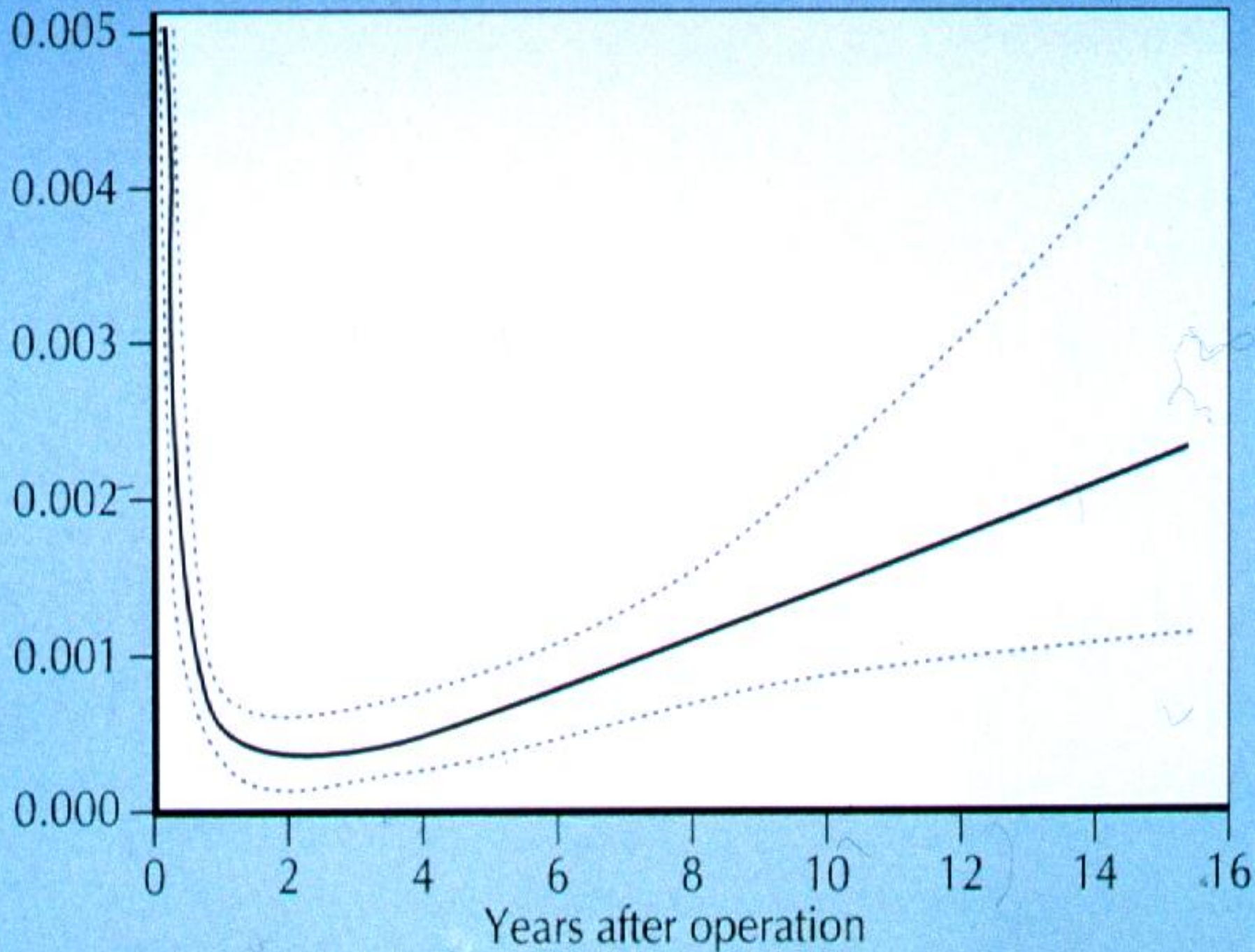


Patients free of reoperation for
pathway obstruction, %



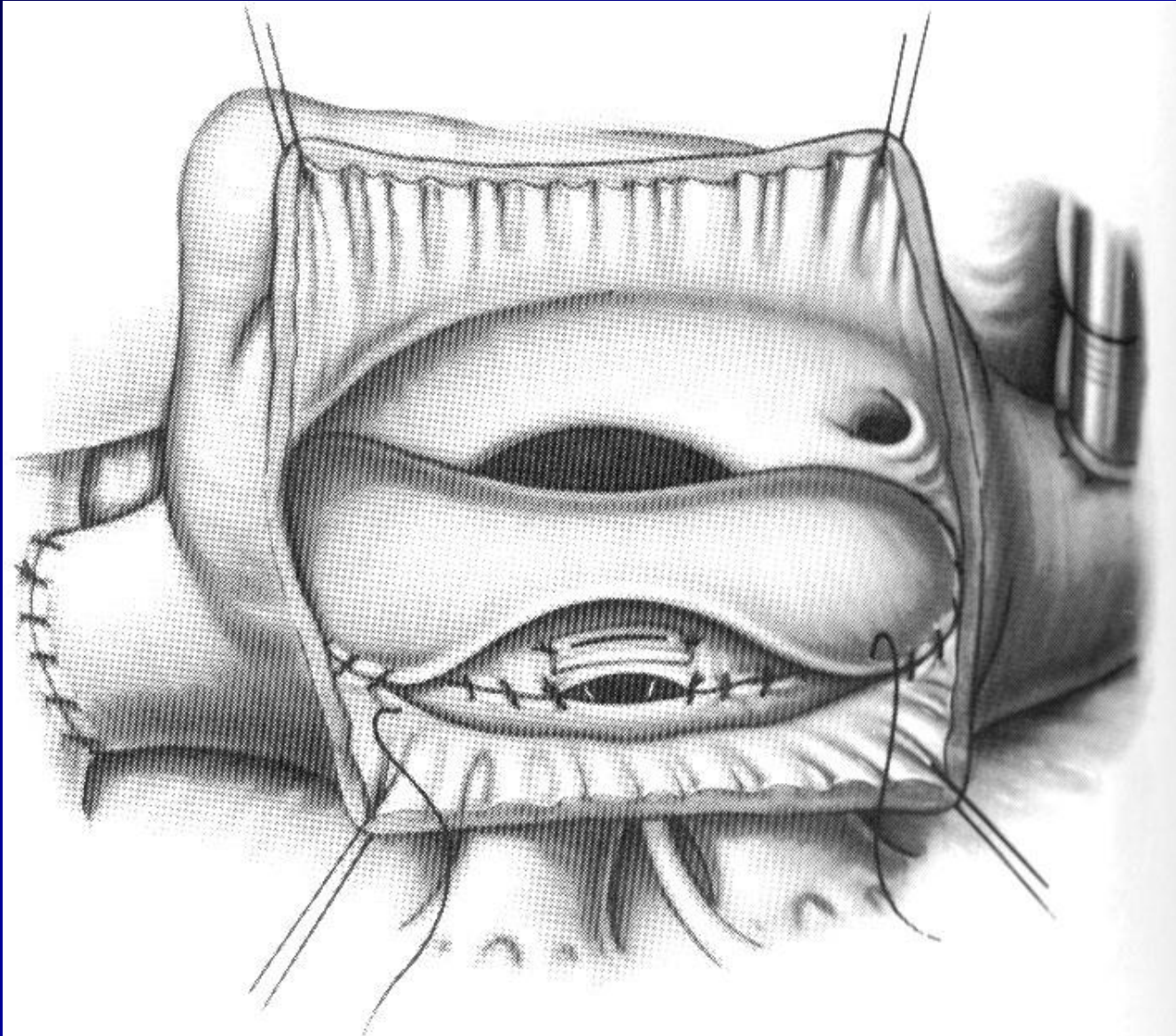
B

Death/mo, n

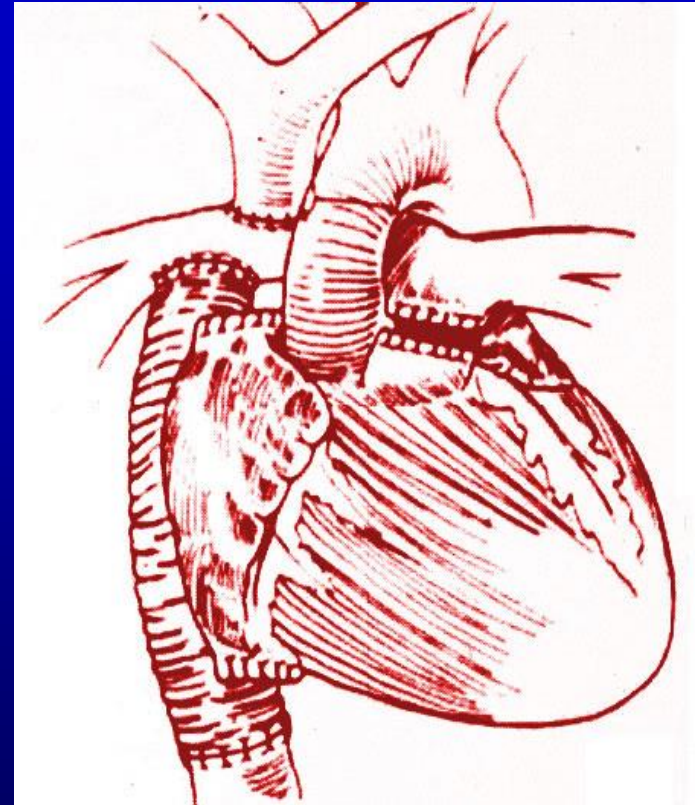
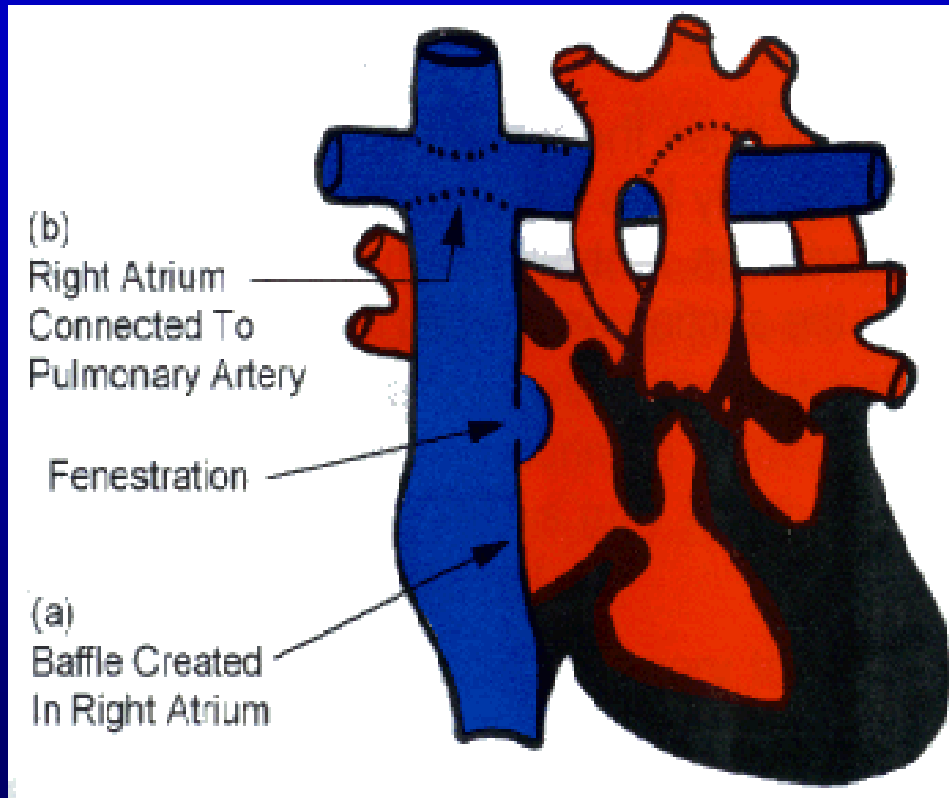


C

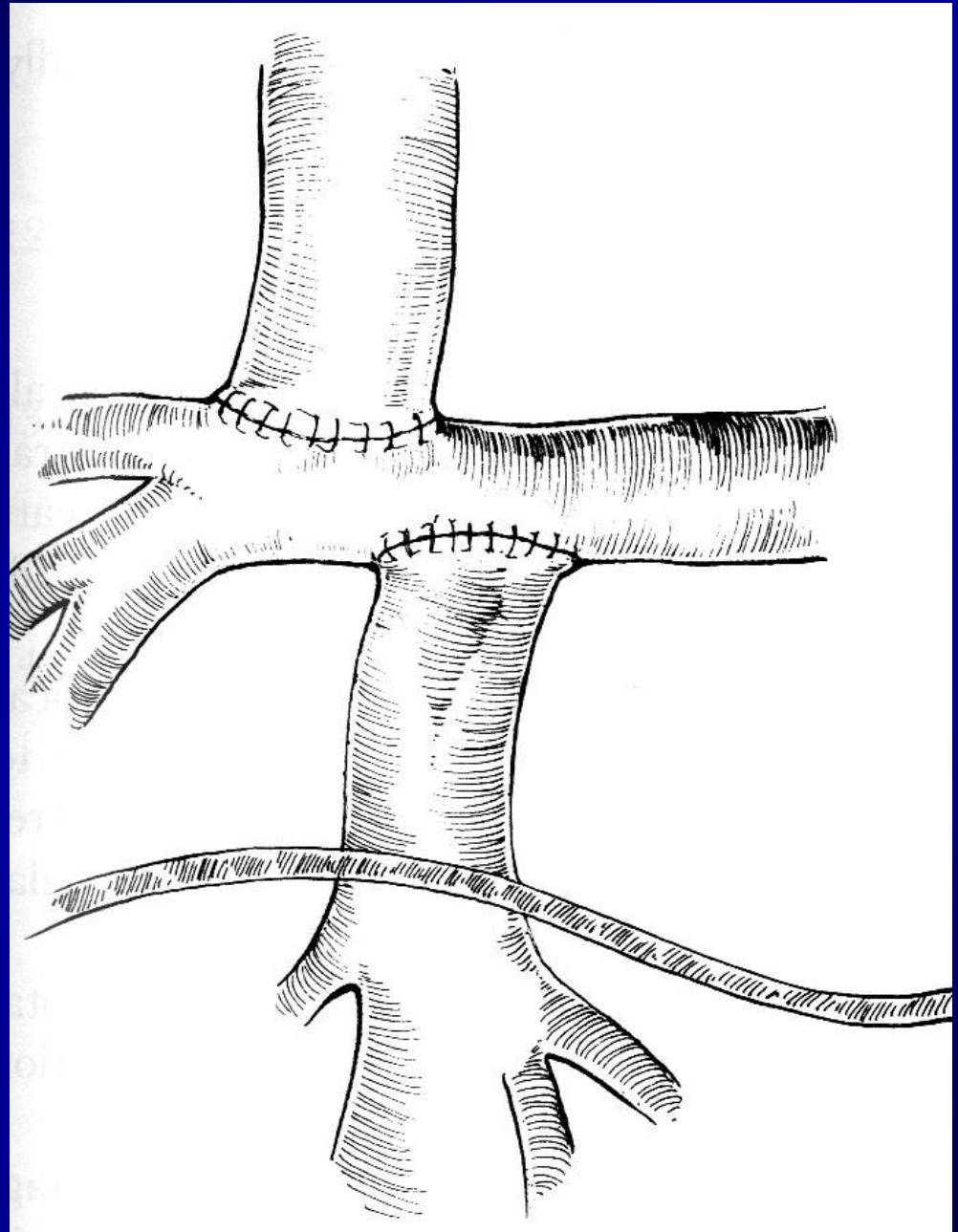
TCPC



Fontan extracardiaca



TCPC
extracardiaca



INTERVENTO di FONTAN

Complicanze

- Ipertensione del circolo cavale
- Trombosi
- Assenza flusso polmonare pulsato
- Aritmie
- Ricomparsa tardiva di cianosi

REINTERVENTI IN FONTAN

- Ostruzione
- Aritmie
(conversion Fontan + Maze Operation)
- PMK
- Trapianto

COMPLICANZE FONTAN

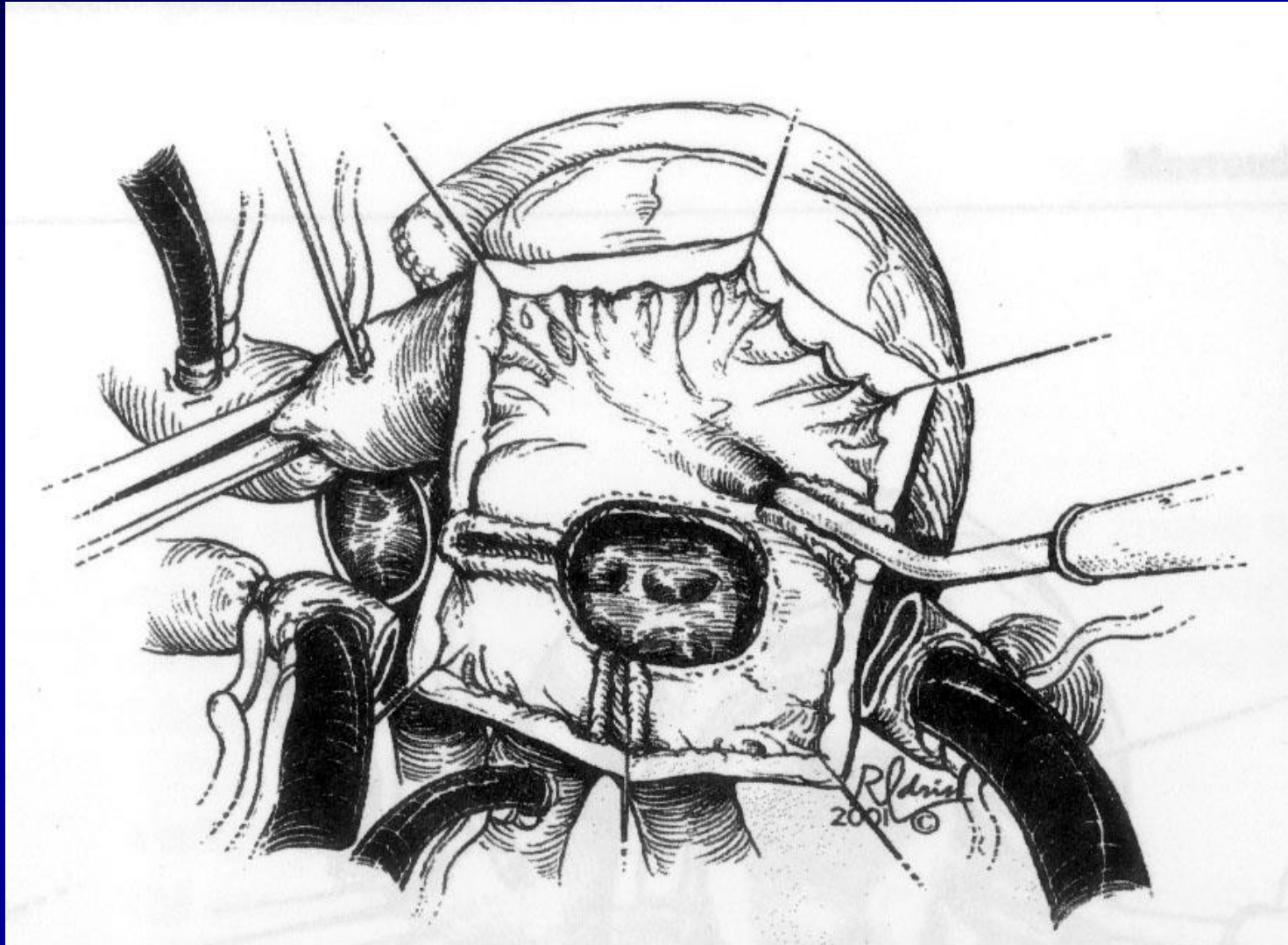
Aritmie atriali

- 25% a 10 aa di follow up
- fattore di rischio per mortalità, tromboembolie, défaillance ventricolare
- Trattamento con antiaritmici, ablazione, correzione + chirurgia delle aritmie

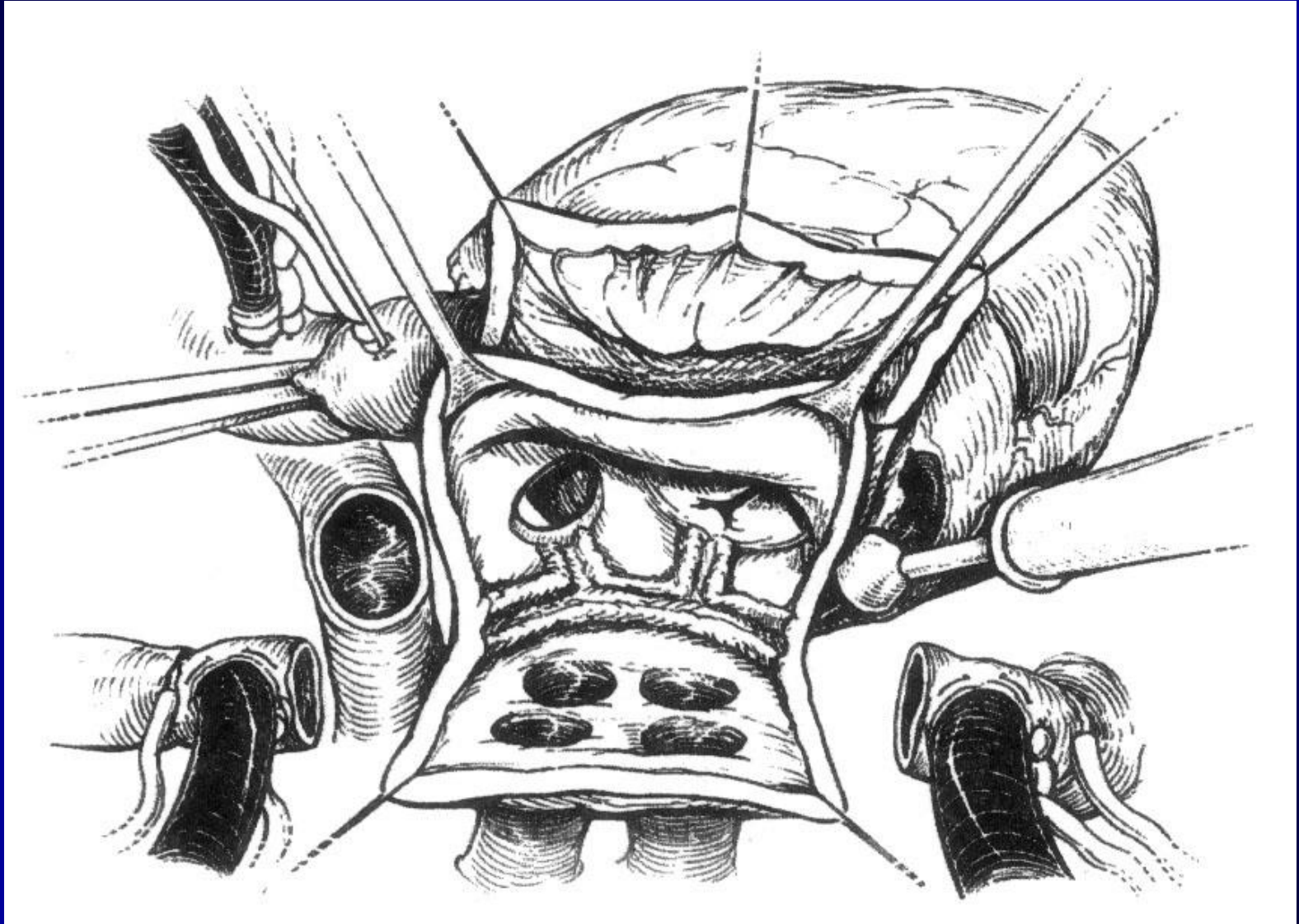
CONVERSIONE FONTAN

- Nei casi di aritmie refrattarie associare sempre crioablazione altrimenti la recidiva è pressochè costante

Chirurgia aritmia



Chirurgia aritmia



CONVERSIONE FONTAN

Indicazioni

- a) Ostruzione in sede di anastomosi
- b) Atriomegalia (tromboembolie-aritmie
-compressione vene polmonari)
- c) Versamenti recidivanti
- d) Enteropatia proteino-disperdente

CONVERSIONE FONTAN



CONVERSIONE FONTAN

- Studio emodinamico preoperatorio obbligatorio
 - Risultati migliori → pz in I-III cl NYHA con un problema specifico (trombosi-compressione vene polmonari-aritmie)
 - Risultati peggiori* → pz in IV cl NYHA con enteropatia proteino-disperdente
- *Trapianto

Adults with CHD

Interesting topics:

- Adults Tetralogy of Fallot
- Adults Fontan patients
- Arrhythmias



ARRHYTHMIAS IN CHD

Multifactorial aetiology

- 1) Part of the defect (Ebstein, CCTGA, etc);
- 2) Consequence of surgery
(Mustard/Senning)
- 3) Result of hemodynamic abnormalities
(Fallot repair, obstructed Fontan, etc).



Arrhythmias in CHD

Relative Risk for Specific Arrhythmias in Common Congenital Heart Defects

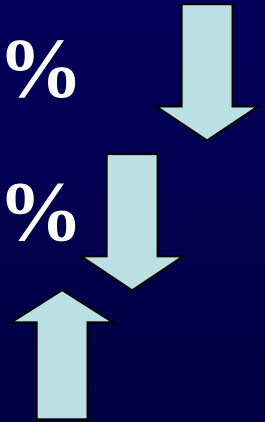
| | IART | AF | WPW | VT/SCD | SA Node
Dysfunction | Spontaneous
AV Block | Traumatic
AV Block |
|-------------------|------|----|-----|--------|------------------------|-------------------------|-----------------------|
| VSD | + | | | + | | | + |
| ASD | + | + | | | | | |
| TOF | ++ | | | ++ | | | + |
| AS | | + | | ++ | | | + |
| D-TGA (M&S) | +++ | | | ++ | +++ | | |
| CAVC | + | | | | | + | ++ |
| SING V (F) | +++ | + | | + | +++ | | |
| L-TGA | + | | ++ | + | | ++ | +++ |
| Ebstein's anomaly | ++ | | +++ | + | | | |

AF indicates atrial fibrillation; WPW, Wolff-Parkinson-White syndrome; SCD, sudden cardiac death; SA, sinoatrial; VSD, ventricular septal defect; ASD, atrial septal defect; TOF, tetralogy of Fallot; AS, aortic stenosis; M&S, after the Mustard or Senning operation; CAVC, common AV canal defect; SING V (F), single ventricle after the Fontan operation; + + +, high risk; + +, moderate risk; and +, slight risk.

ARRHYTHMIAS IN CHD

Incidence

| | |
|-----------------------------|--------|
| - Adult ASD | 14-22% |
| - Fontan operation | 40-60% |
| - Senning/Mustard operation | 20-50% |
| - T. Fallot (post repair) | 34% |
| - Ebstein | 35% |



Arrhythmias in ACHD

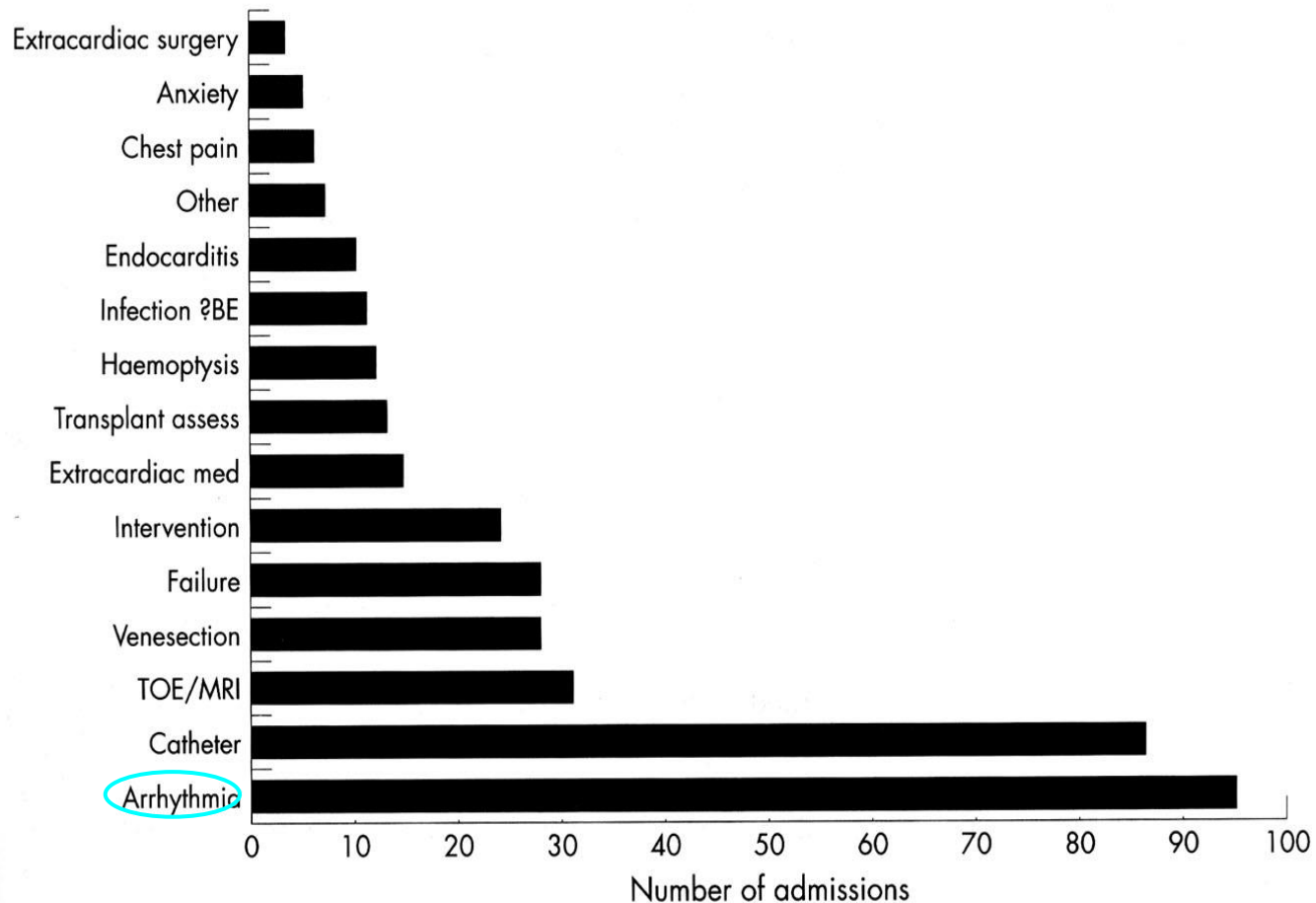
“Late onset arrhythmias in Adulthood appear to have become the price to pay for decades of effective haemodynamic palliation”

E.P.Walsh, F. Cecchin

Circulation 2007;115:534-545

Hospital admissions: causes

Grown-up congenital heart disease



ARRHYTHMIAS IN CHD

Therapeutic options

1. Medical therapy
2. Transcatheter ablation
3. Cardioverter/defibrillator
4. PMK implantation
5. *Surgical treatment*



SURGICAL TREATMENT OF ARRHYTHMIAS

Indications

- 1. For pts that failed
ablation procedures**
- 2. For pts requiring concomitant
surgical intervention**

Surgery is not an alternative to ablation



SURGERY OF THE DEFECT ALONE

- ASD Closure**
- Fontan Conversion**
- Pulmonary Valve Implantation in RVOT**

Arrhythmias are not modified by the surgical treatment of the defect alone, surgical ablation MUST be added !



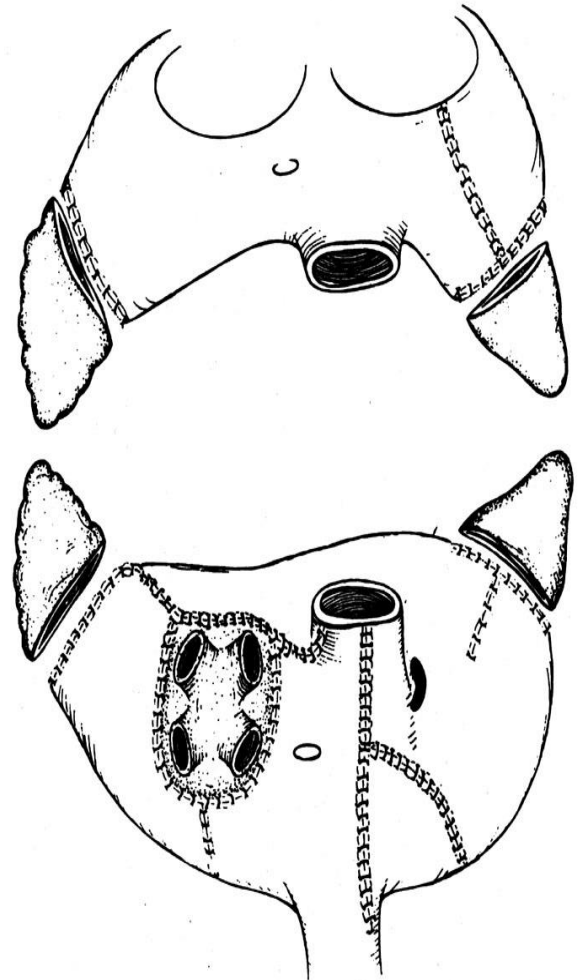
Surgical treatment of arrhythmias

MODIFICATION OF THE MAZE PROCEDURE FOR ATRIAL FLUTTER AND ATRIAL FIBRILLATION

II. Surgical technique of the maze III procedure

The operative technique of the maze III procedure for the treatment of patients with medically refractory atrial flutter and atrial fibrillation is described in a sequential fashion. The accompanying diagrams of the procedure are illustrated from the view of the operating surgeon. (J THORAC CARDIOVASC SURG 1995;110:485-95)

James L. Cox, MD, Robert D. B. Jaquiss, MD, Richard B. Schuessler, PhD, and John P. Boineau, MD, *St. Louis, Mo.*



***at 1-yr FU, ca. 90%
of pts in SR!***



SURGICAL TREATMENT OF ARRHYTHMIAS

Indications



PRO

- **Transmurality**
- **AV node preserved**
- **Atrial contraction preserved**
- **Success ~ 90% pts**

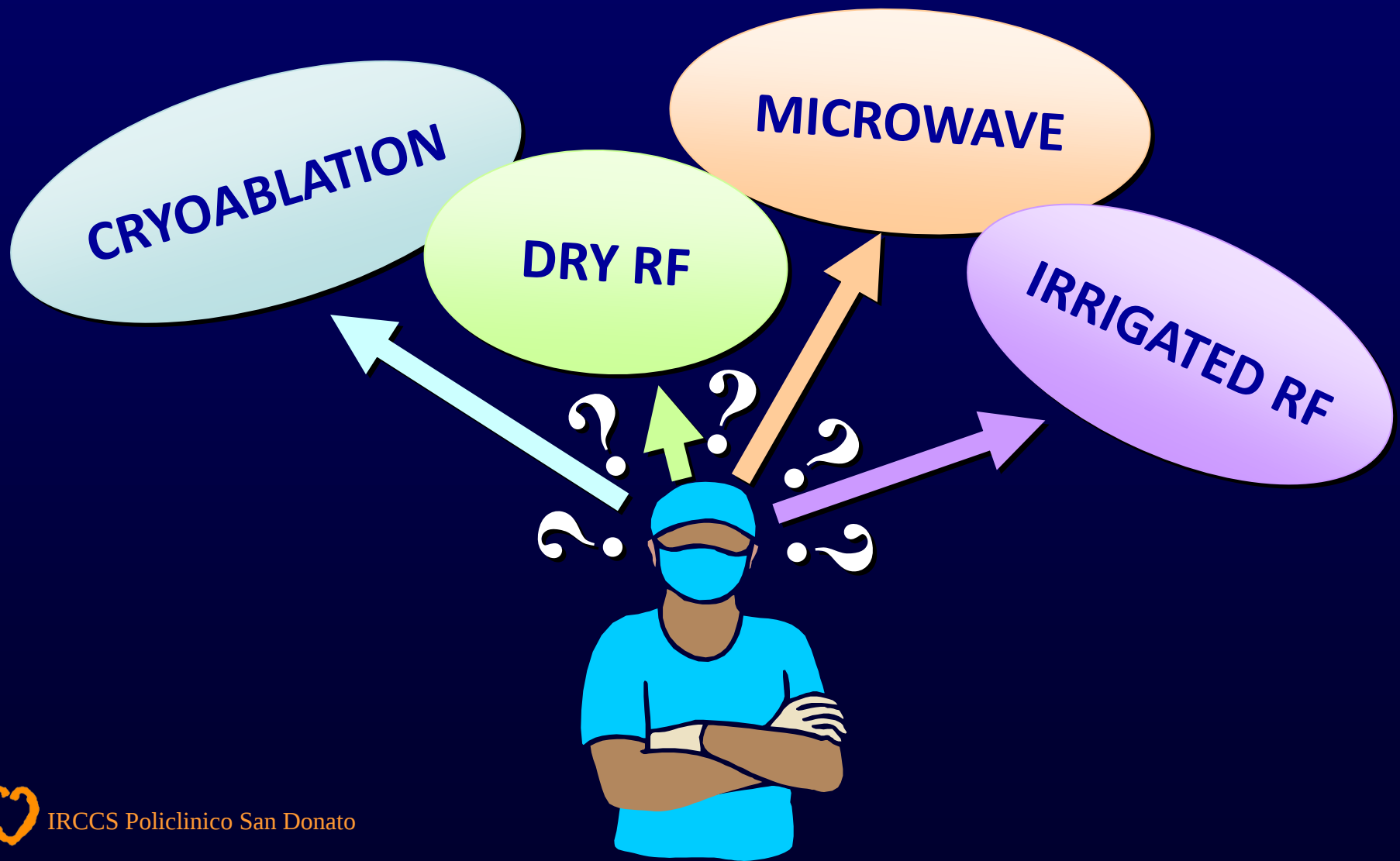
CONS

- **Complex procedure**
- **Long bypass and Ao cross-clamp time**
- **Bleeding**
- **Pulmonary veins stenosis**

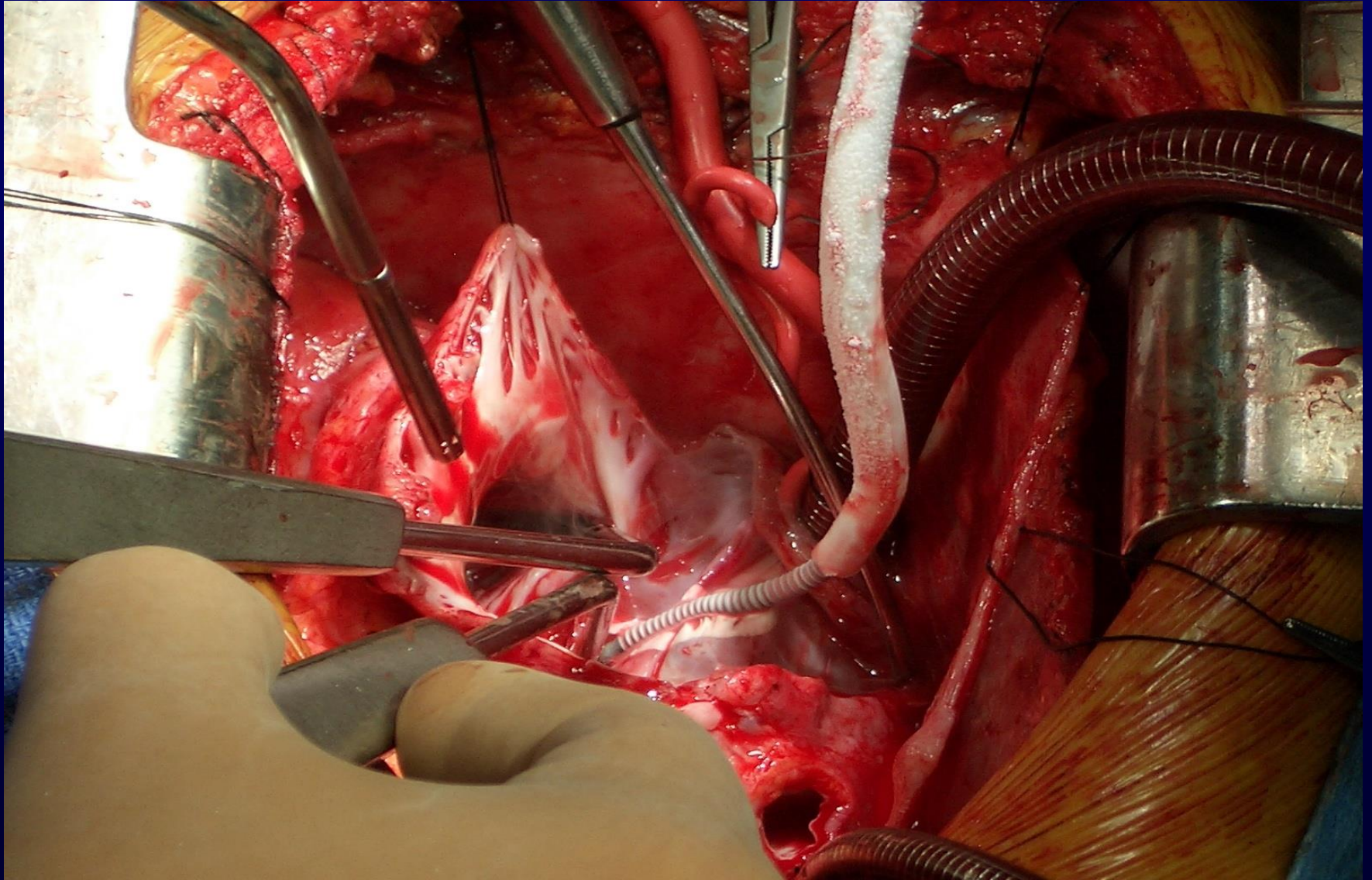


SURGICAL TREATMENT OF ARRHYTHMIAS

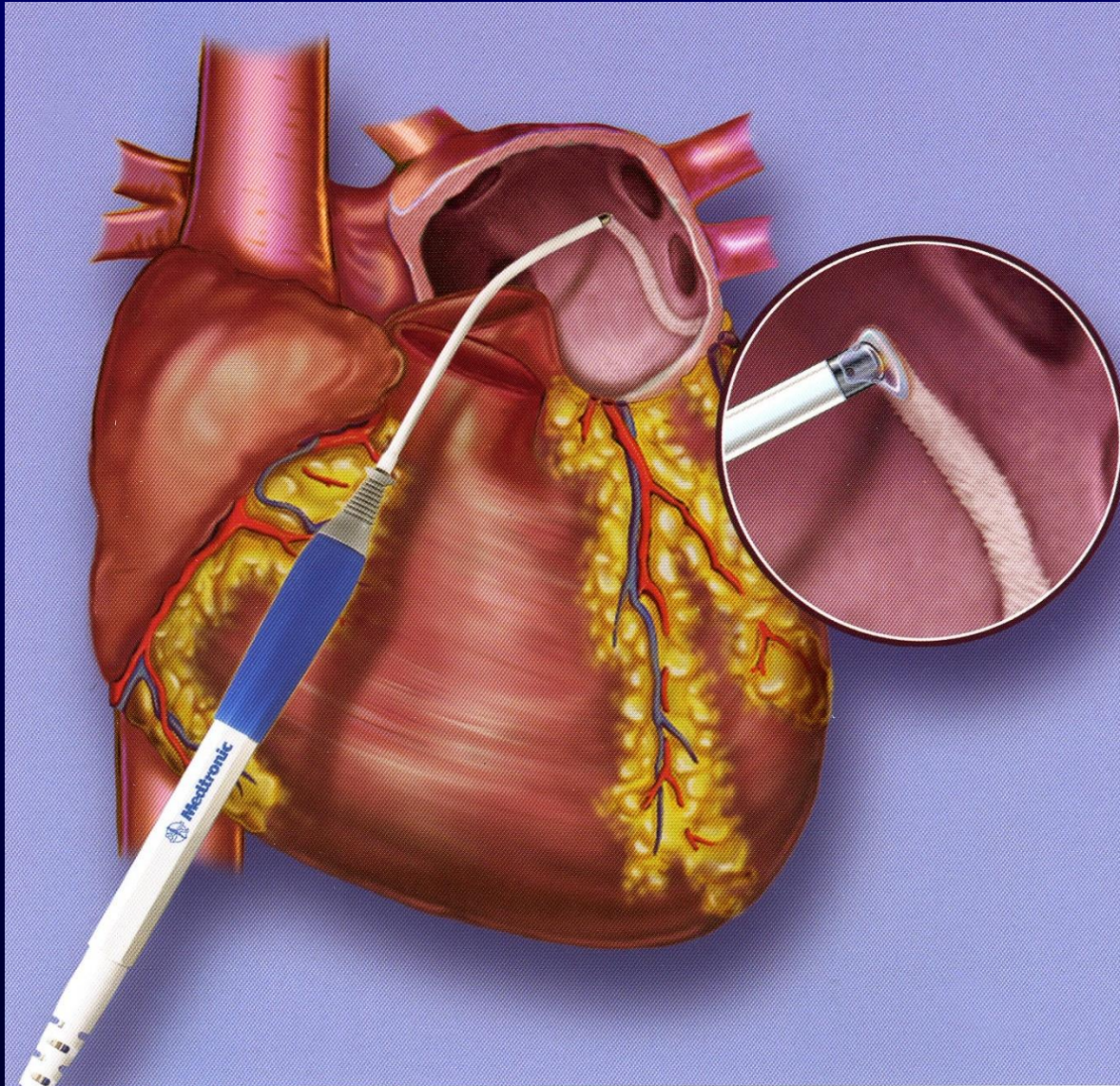
Research of alternative energy sources



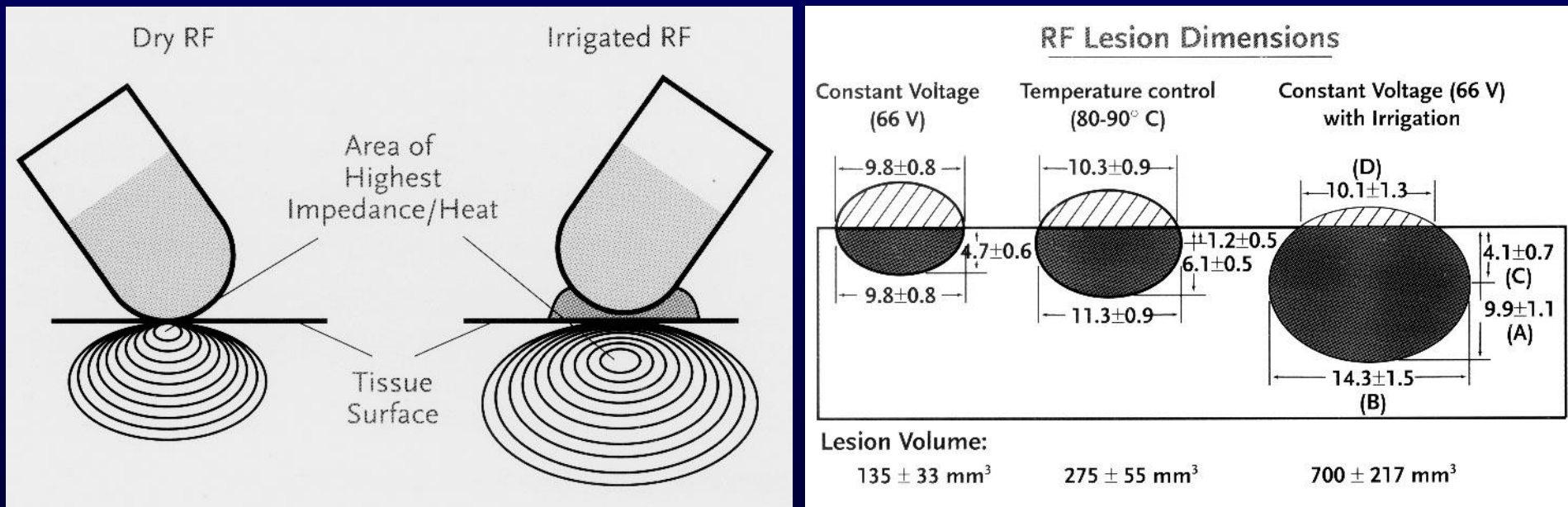
CRYOABLATION



Monopolar Irrigated Radiofrequency



MONOPOLAR IRRIGATED RADIOFREQUENCY *Research of transmural*



Nakagawa H. et al, Circulation 1995; 91: 2264-73



Surgical treatment of arrhythmias

Ablation design

Combined Atrial Septal Defect Surgical Closure and Irrigated Radiofrequency Ablation in Adult Patients

Alessandro Giamberti, MD, Massimo Chessa, MD, PhD, Sara Foresti, MD, Raul Abella, MD, Gianfranco Butera, MD, Carlo de Vincentiis, MD, Mario Carminati, MD, Lorenzo Menicanti, MD, and Alessandro Frigiola, MD

Pediatric Cardiology and Cardiac Surgery Department, GUCH Unit, "E. Malan" Center, Policlinico San Donato, San Donato Milanese, Italy

Ann Thorac Surg 2006;82:1327–31

Surgical treatment of arrhythmias in adults with congenital heart defects

Alessandro Giamberti*, Massimo Chessa, Raul Abella, Gianfranco Butera, Diana Negura, Sara Foresti, Mario Carminati, Riccardo Cappato, Alessandro Frigiola

Pediatric Cardiology and Cardiac Surgery Department- GUCH Unit, IRCCS Policlinico San Donato, San Donato M.se (MI), Italy

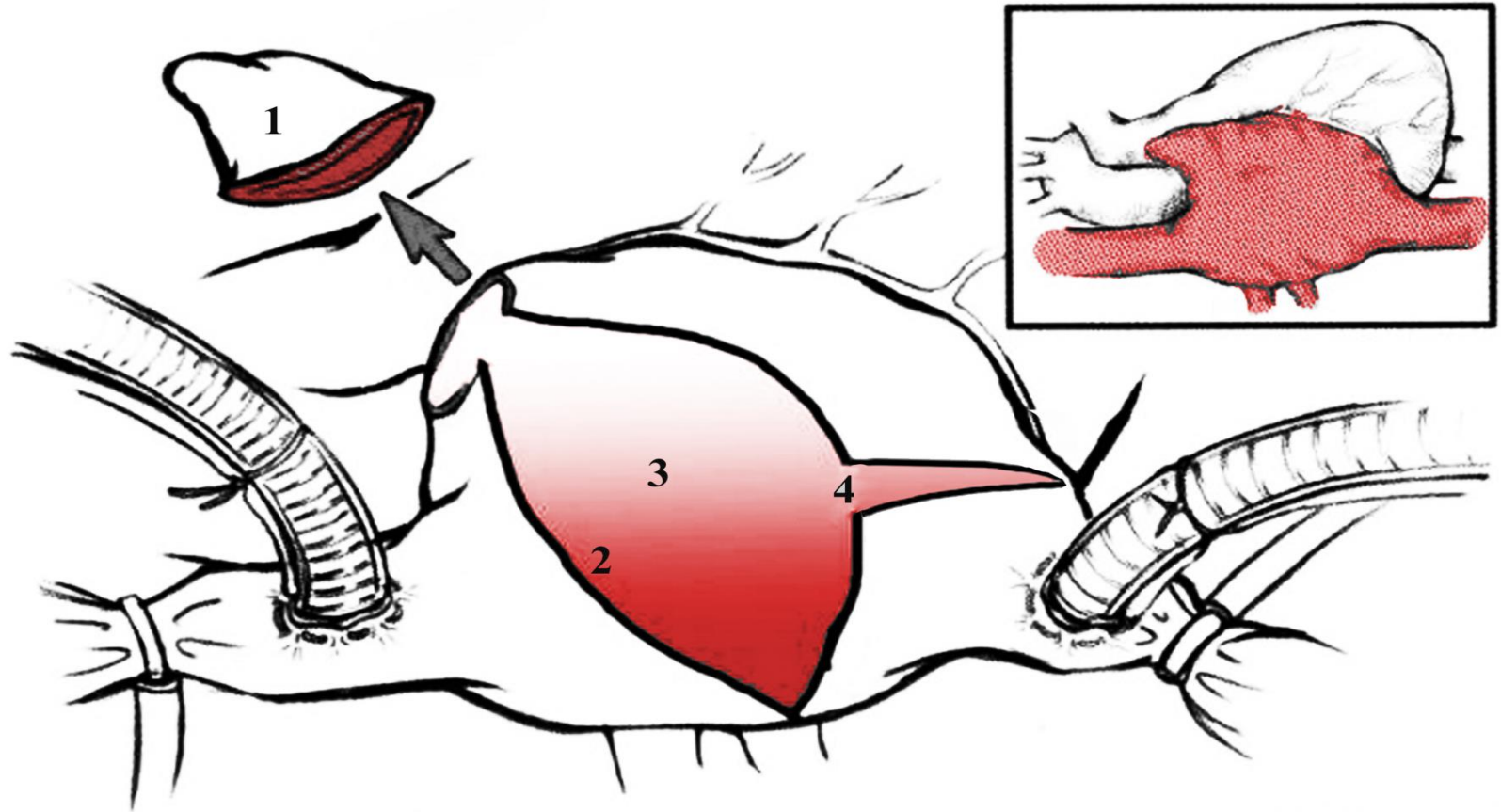
Received 26 April 2007; accepted 23 June 2007
Available online 8 August 2007

Int J Cardiol. 2008 Sep 16;129(1):37-41



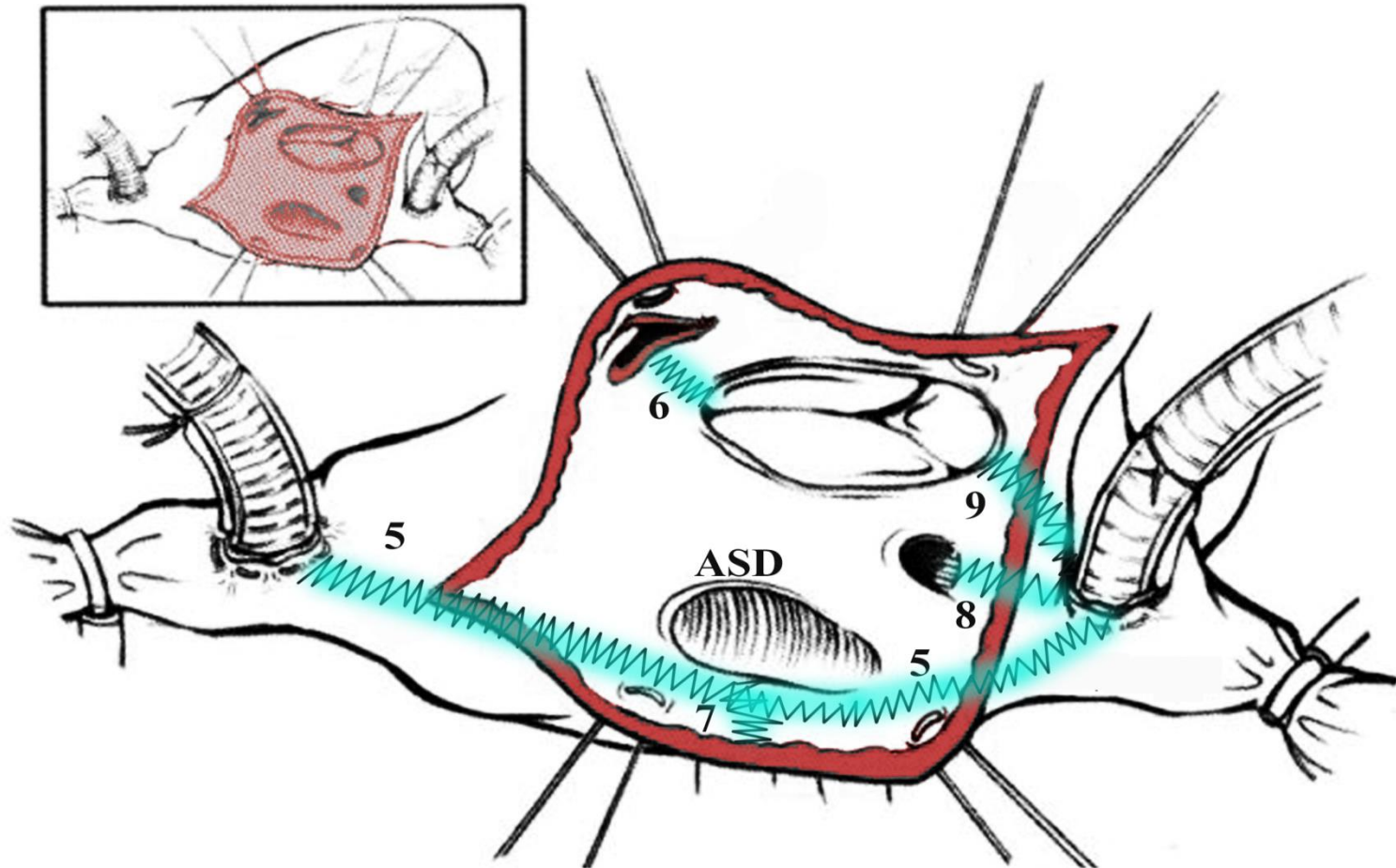
SURGICAL TREATMENT OF ARRHYTHMIAS

Ablation design



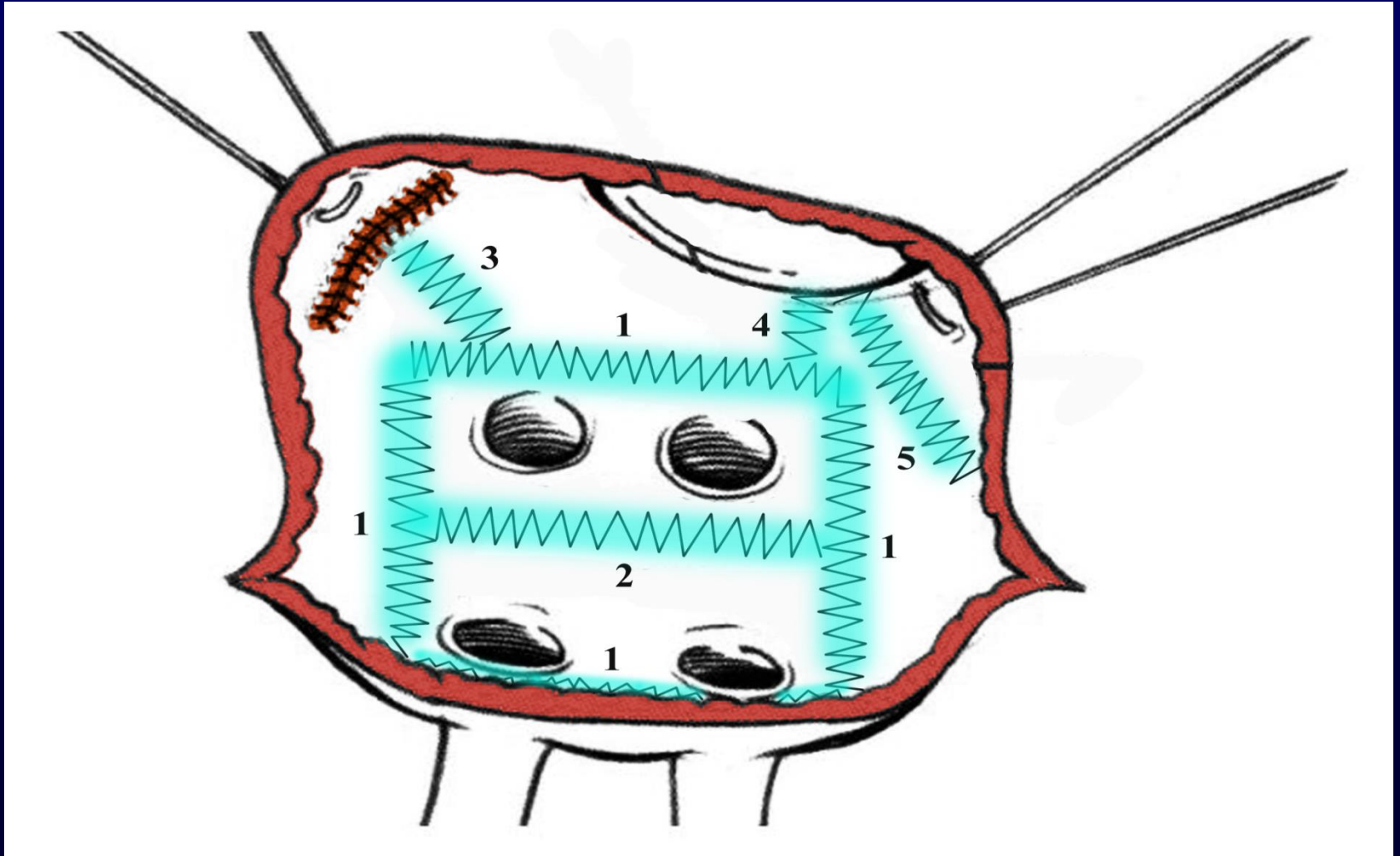
SURGICAL TREATMENT OF ARRHYTHMIAS

Ablation design

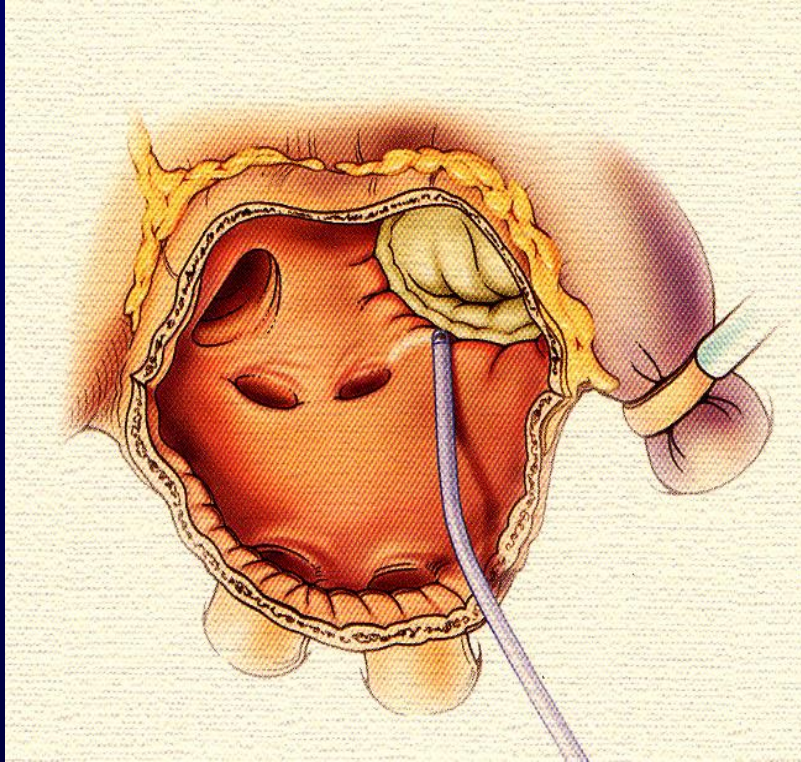


SURGICAL TREATMENT OF ARRHYTHMIAS

Ablation design



ARRHYTHMIAS SURGERY: PROTOCOL



- 1) Joint commission evaluation
- 2) Pre-op EPS (no for AF)
- 3) EPS VT induction

ATRIAL FIBRILLATION
RE-ENTRY ATRIAL TACHY
VENTRICULAR TACHY

→ **COX-MAZE III**
→ **RIGHT-SIDED MAZE**
→ **VENTR. ABLATION**



IRCCS Policlinico San Donato

September 2002 – July 2013

N° pz 97

| | | | |
|--------------------------|-----------|----------|--------------------|
| PV implantation | 40 | → | > 20 yrs |
| ASD | 20 | → | > 45 yrs |
| Conversion/Fontan | 20 | → | > 16 yrs |
| p AVC | 5 | → | > 30 yrs |
| Ebtsein/TV dyspl | 5 | → | > 35 yrs |
| Scymitar syndrome | 2 | → | > 30 yrs |
| Cor triatriatum | 2 | → | 58 yrs |
| CC TGA | 1 | → | 33 yrs |
| T. Fallot | 1 | → | 58 yrs |
| VSD | 1 | → | 25 yrs |



IRCCS Policlinico San Donato

Techniques

Right-side Maze  **45**

Cox-Maze III (R and L)  **32**

RV ablation  **20**

Mean time of ablation:

15 min on LA in Ao clamped

15-20 min on RA in Ao de-clamped



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Results

Hospital deaths **5 (5/97=5%)**

3 LCOS (TV repair, 2 Conv. Fontan)

1 Sepsis (Conv. Fontan)

1 Cancer (TF)

Mean follow-up 61 mos (2-144 mos)

Late deaths **3 (3//92=3%)**



SURGICAL TREATMENT OF ARRHYTHMIAS

Arrhythmias Recurrence

Recurrence right-sided Maze **9 (20%)**

3 cath ablation

6 medical therapy

Recurrence Cox-Maze III **6 (19%)**

5 medical therapy

1 PMK implantation

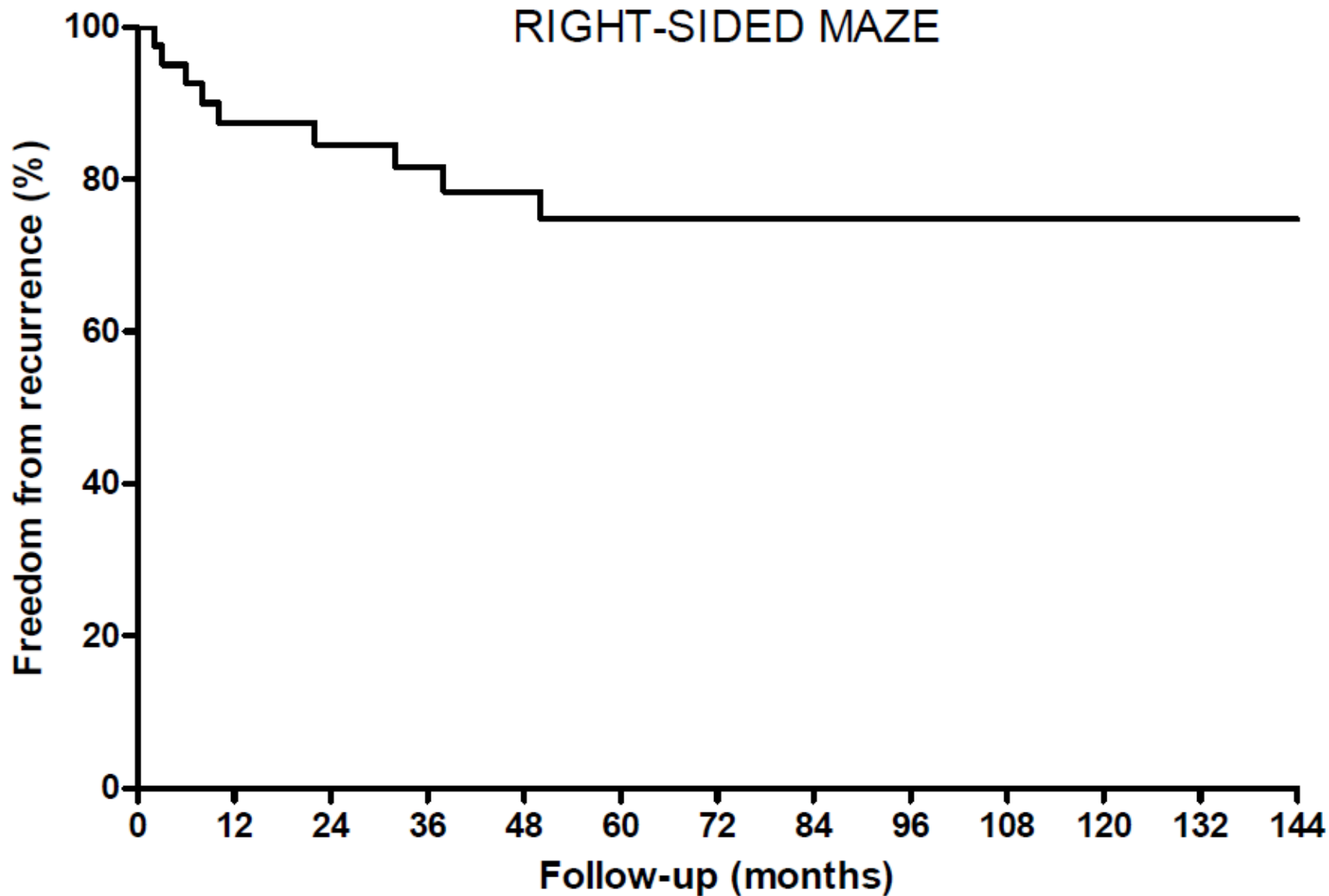
Recurrence RV Ablation **7 (35%)**

4 medical therapy

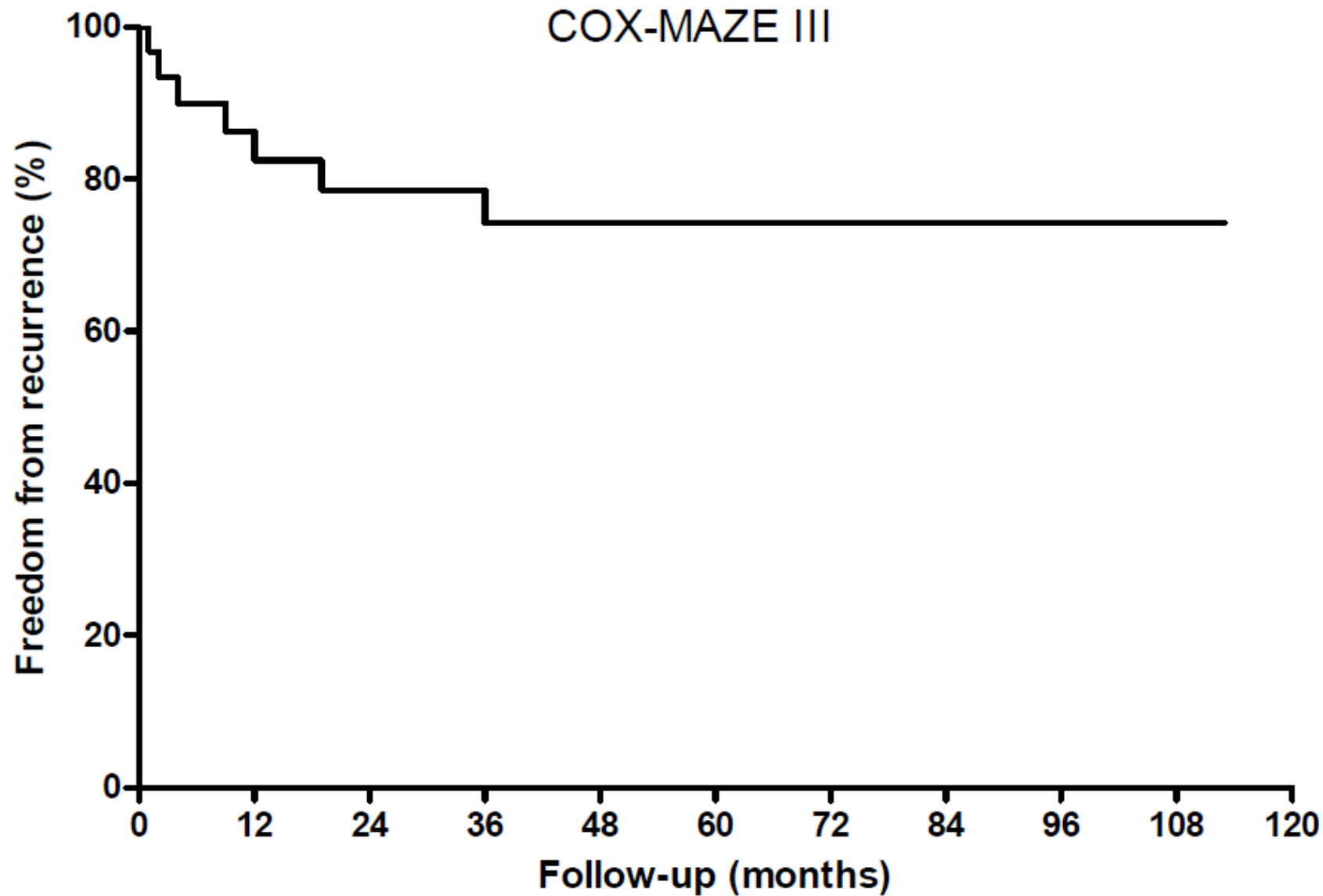
2 ICD implantation, 1 cath ablation



RIGHT-SIDED MAZE



COX-MAZE III



RISK FACTORS FOR ARRHYTHMIAS RECURRENCE IN UNIVARIATE ANALYSIS

- Preop arrhyt.duration $p= 0.003$
- Right side Maze for AF $p= 0.001$
- AF in TOF $p= 0.001$



Team work!!!

***Multidisciplinary approach
allow to chose the best
tailored treatment for
arrhythmia in every single
CHD patient***

Grande impegno !!!

Team di specialisti dedicati alla cura dei pazienti, alla ricerca, all'attività scientifica, alla divulgazione delle conoscenze, al miglioramento della qualità di vita dei pazienti.

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Ultimo lavoro scientifico

Porcine Bioprosthetic Valve in the Pulmonary Position: Mid-Term Results in the Right Ventricular Outflow Tract Reconstruction

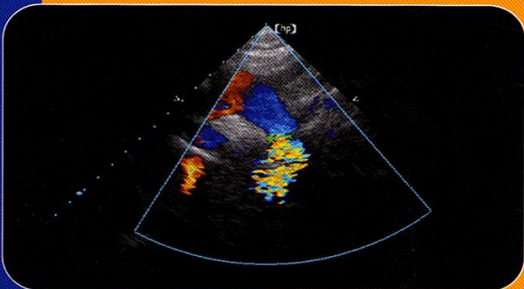
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***Pediatr Cardiol.* 2013 Feb 24. Epub ahead of print**

MICHAEL A. GATZOULIS • LORNA SWAN
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Cardiopatie congenite dell'adulto

Una guida pratica



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The Right Ventricle in Adults with Tetralogy of Fallot

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***Primo volume in
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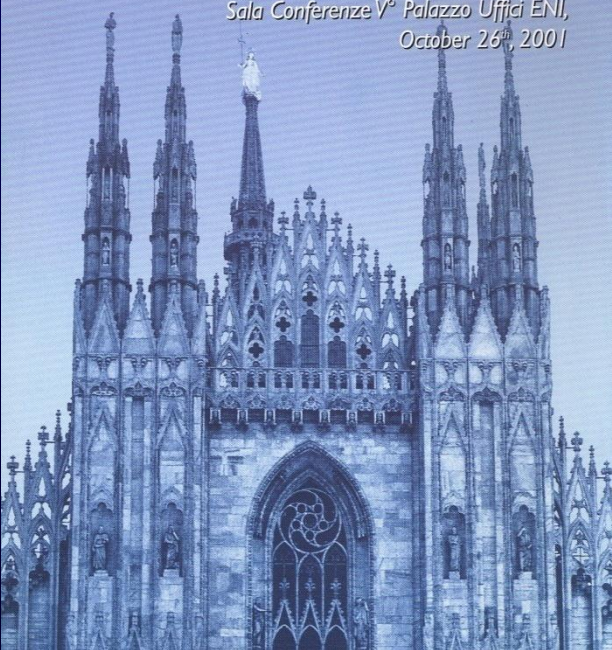
Extimed Publication: December 2013



International Meetings on Adults with CHD

ADULTS WITH CONGENITAL HEART DISEASE International Meeting

*San Donato Milanese,
Sala Conferenze V° Palazzo Uffici ENI,
October 26th, 2001*



UNIVERSITÀ DEGLI STUDI DI MILANO
ISTITUTO POLICLINICO
SAN DONATO



CENTRO CARDIOVASCOLARE
EDMONDO MALAN

**CONVERSIONE FONTAN
E CHIRURGIA DELLE ARITMIE
nei cardiopatici congeniti adulti**

**4 Febbraio 2005
Istituto Policlinico San Donato**

Direzione Scientifica Dr. A. Giamberti e Dr. M. Chessa



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**2° CORSO
DI AGGIORNAMENTO
SUL CARDIOPATICO
CONGENITO ADULTO**

**il ventricolo destro:
come trattare le problematiche
a lungo termine dopo chirurgia**

I difetti interatriali

**Milano,
23 giugno 2006**



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International Meetings on Adults with CHD



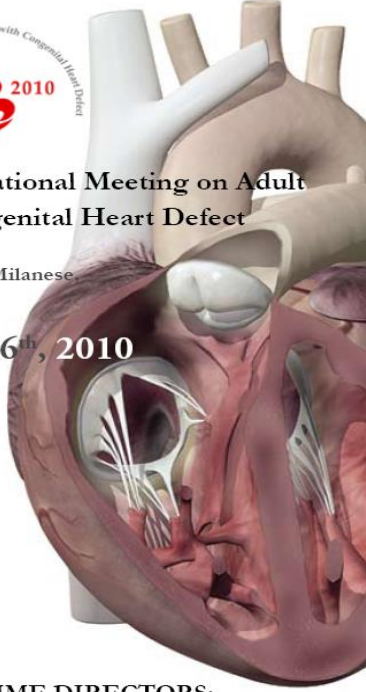
**III MEETING ON ADULT
WITH CONGENITAL HEART DEFECT**
Emerging and burning problems

San Donato Milanese - Milan
April 18th, 2008



IRCCS Policlinico San Donato
Centro di Cardiologia Pediatrica & Cardiopatie Congenite dell'Adulto

Programme Directors
Dr. Massimo Chessa & Dr. Alessandro Giamberti




IV International Meeting on Adult with Congenital Heart Defect
IMACHD 2010

San Donato Milanese - Milan
March 26th, 2010

PROGRAMME DIRECTORS:
Dr. Massimo Chessa & Dr. Alessandro Giamberti

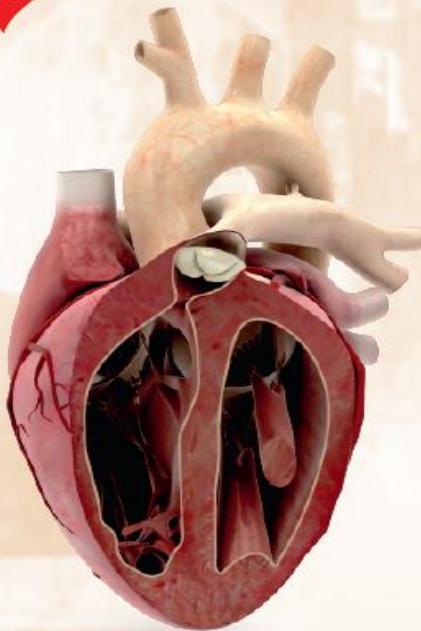


V International Meeting
on Adult with Congenital Heart Disease

San Donato Milanese
Milan



30th
MARCH
2012



Programme Directors:
Massimo Chessa & Alessandro Giamberti

2013 Meetings

4th European Meeting: Adult Congenital Heart Disease

Grown-up Congenital
Heart Disease
ESC Working Group

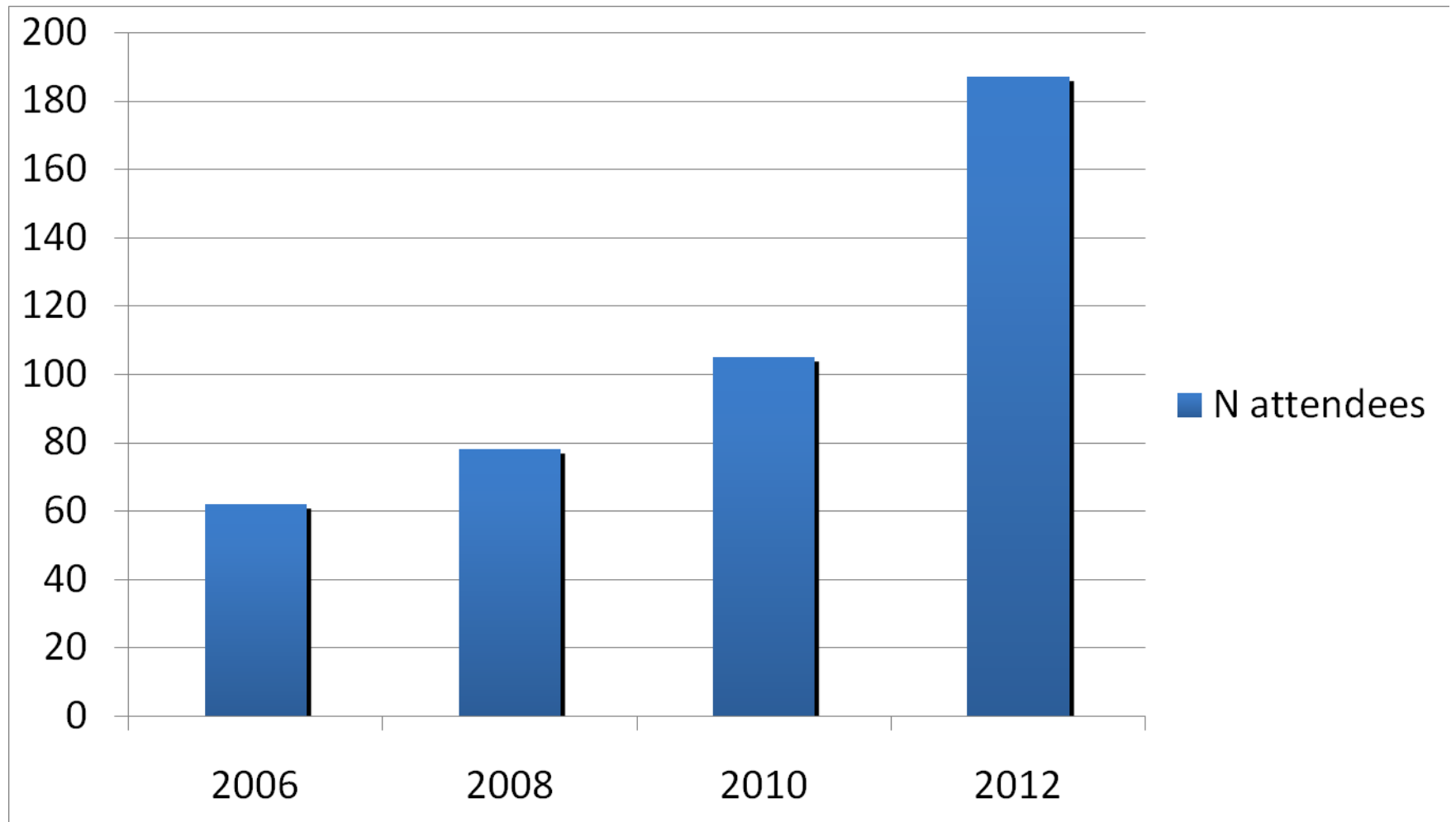


EUROPEAN
SOCIETY OF
CARDIOLOGY*

22-23 March 2013
Milan Marriott Hotel



The growing number of attendees confirm growing interest!!



Prossimo Meeting

Future meetings:

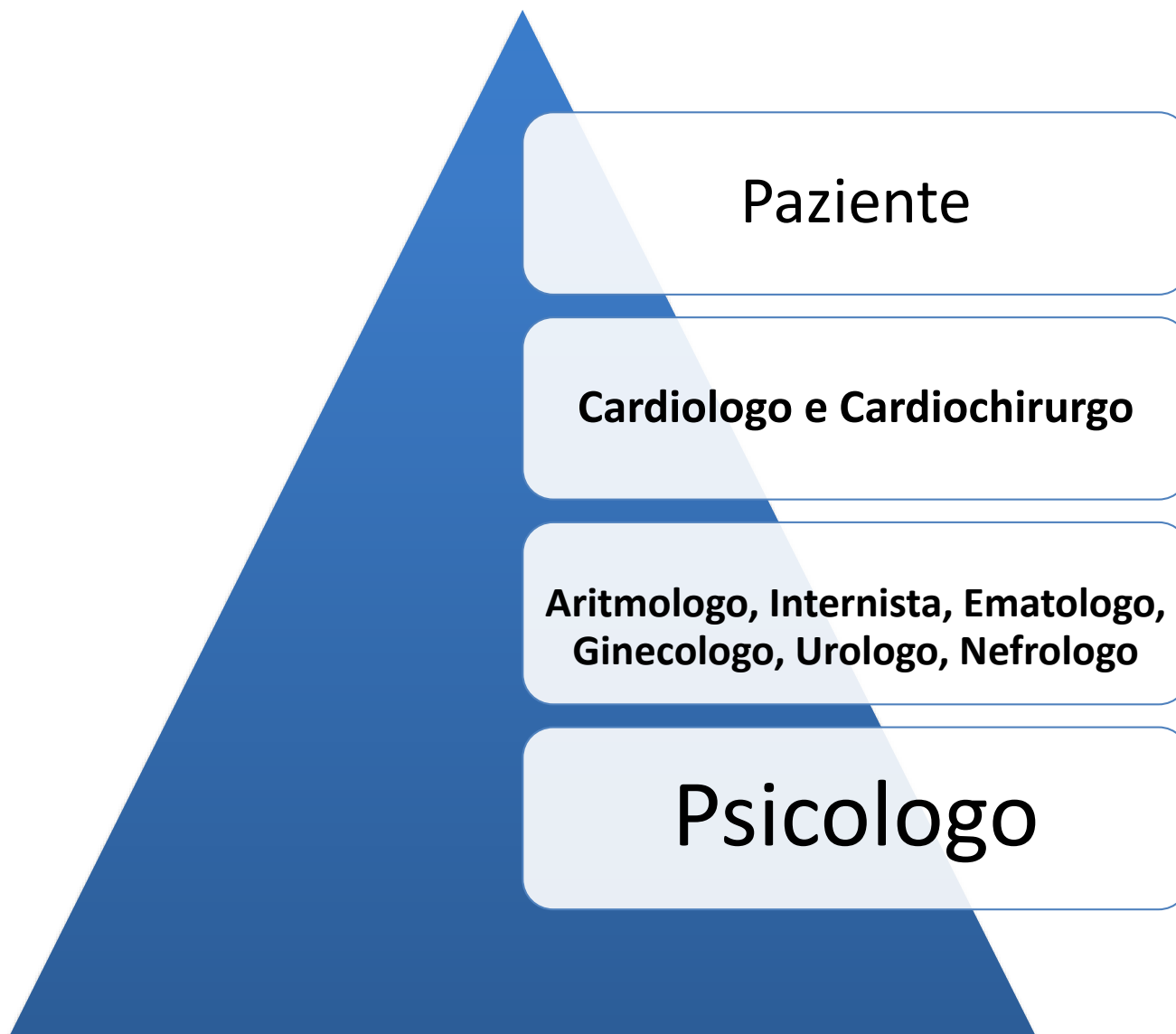
VI International Meeting on Adult Congenital



***IMAC 2014
March 28th 2014***

One day meeting on ONE Topic in the morning and cases related presentation in the afternoon

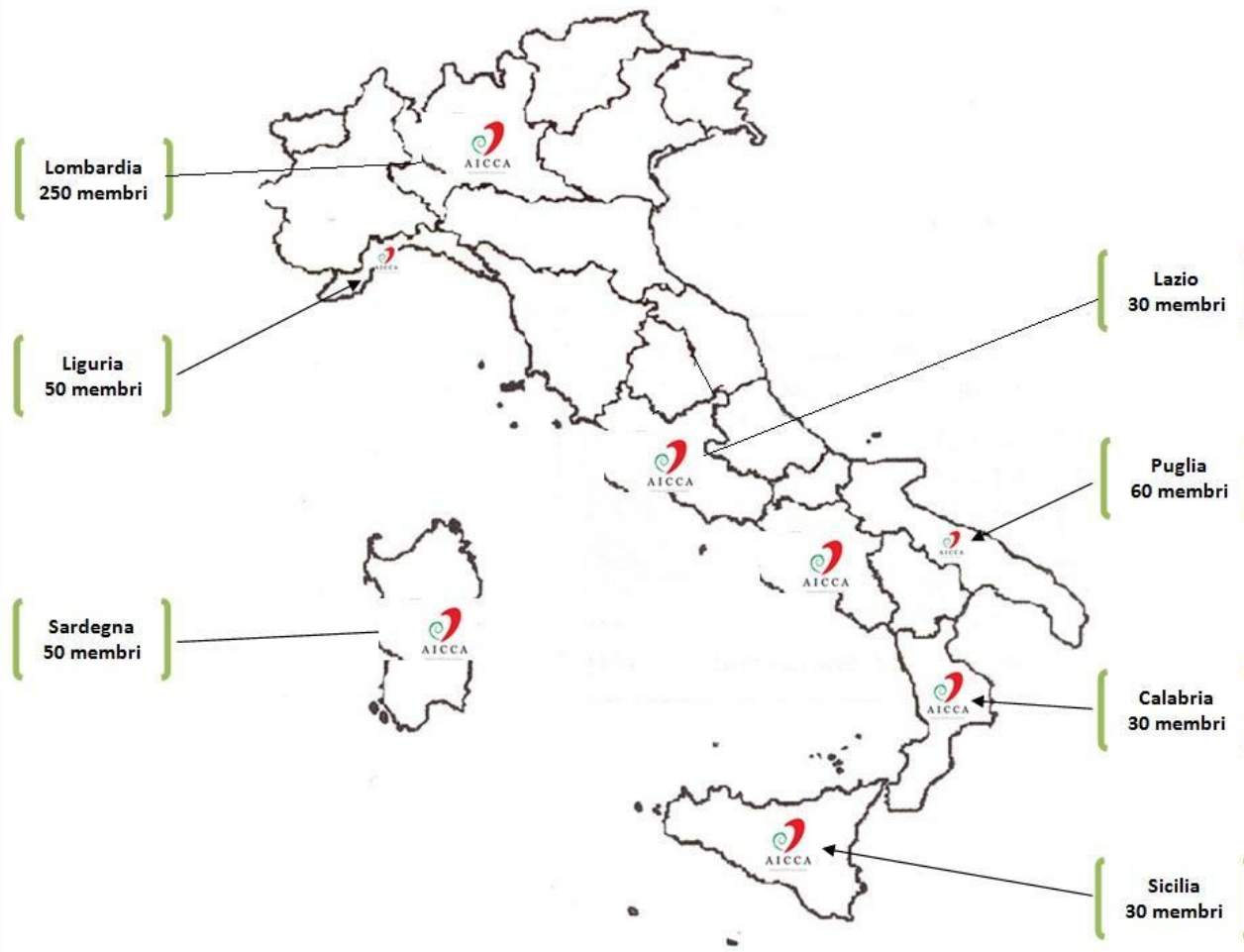




Creazione di un'Associazione dedicata al **Cardiopatico Congenito Adulto** (www.aicca.it), inserita nel network europeo: ECHDO (www.echdo.org) di cui siamo i rappresentanti per l'Italia (il Vice Presidente è membro di AICCA)!!



**SEDI
AICCA**



Attivazione di una borsa di studio dedicata al congenito adulto.

La beneficiante è la **dott.ssa Susanna Bonfante** (psicologa) che si sta occupando della gestione ed immissione dati di un database generale sui pazienti congeniti adulti .

La borsa ammonta a **8.000 Euro**, e le risorse sono state da noi reperite per sostenere almeno i **primi 2 anni**.