

Enfoque Clínico Actual de la Insuficiencia Cardiaca

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Bogotá 5 de noviembre de 2012



ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012

The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC

Definición

Falla cardiaca se define clínicamente como un síndrome en el cual los pacientes Tienen síntomas (disnea, edema maleolar y fatiga) y signos (presión venosa yugular elevada, crepitos pulmonares y latido del ápex desplazado) típicos resultantes de una Anormalidad estructural o funcional cardiaca.

Falla cardiaca

Tamaño del problema:

EN E.U DE NORTEAMERICA

- 1-2% de la población adulta
- 10% en los mayores de 70 años
- 240 millones de habitantes
- 5 millones de enfermos
- 550.000 ingresos por año
- 28 BILLONES DE DOLARES POR AÑO

ACC/AHA Circulation 2005, pag 82

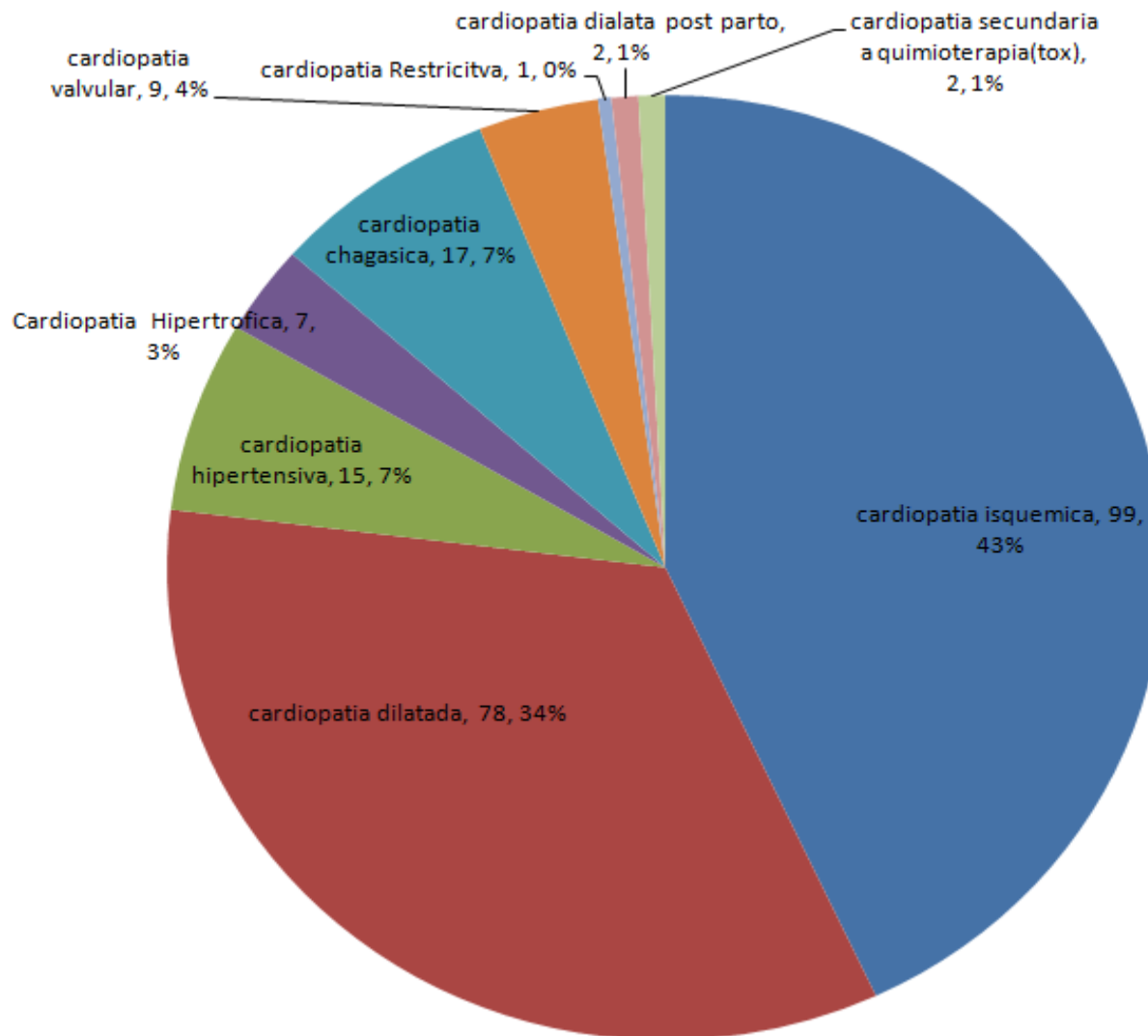
Año 2006

- 300.000 “ falla cardiaca” certificados de defuncion
- 1.100.000 “ falla cardiaca” hospitalizaciones

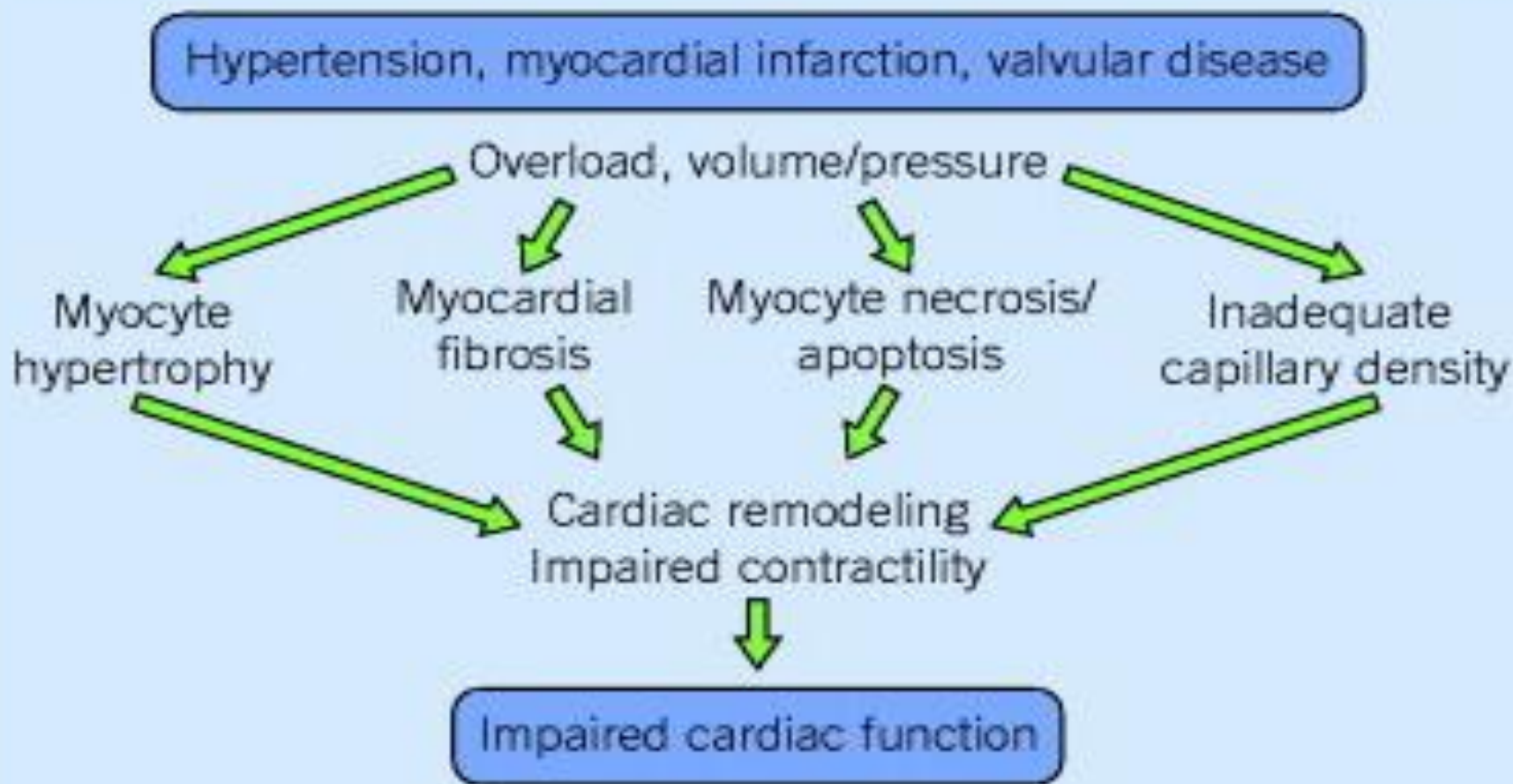
Prog Cardiovas Dis 2011; 54:86-96

“EN COLOMBIA 800.000 ENFERMOS Y 80.000 INGRESOS POR AÑO” ?

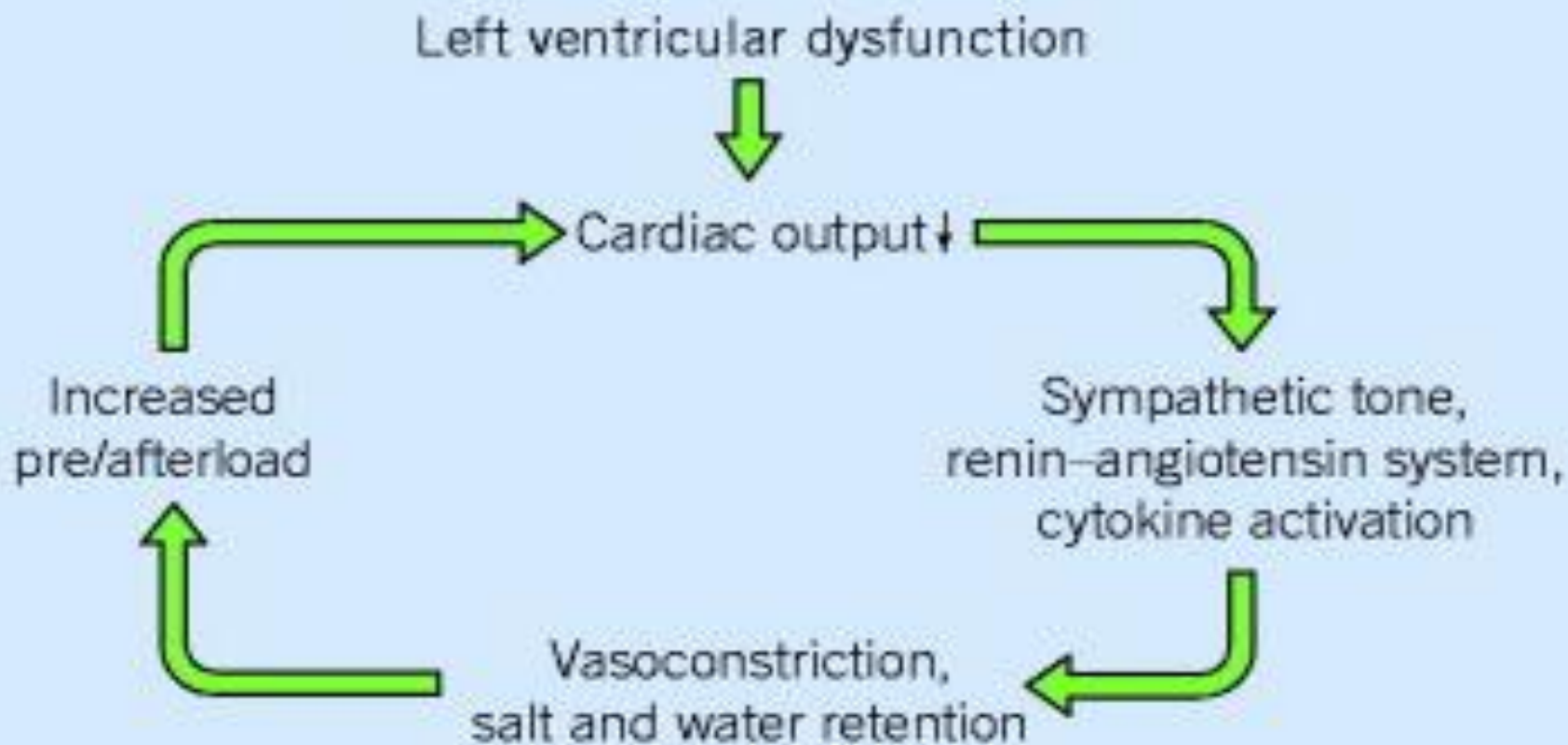
Clínica de Falla cardiaca FCI –IC 230 pacientes



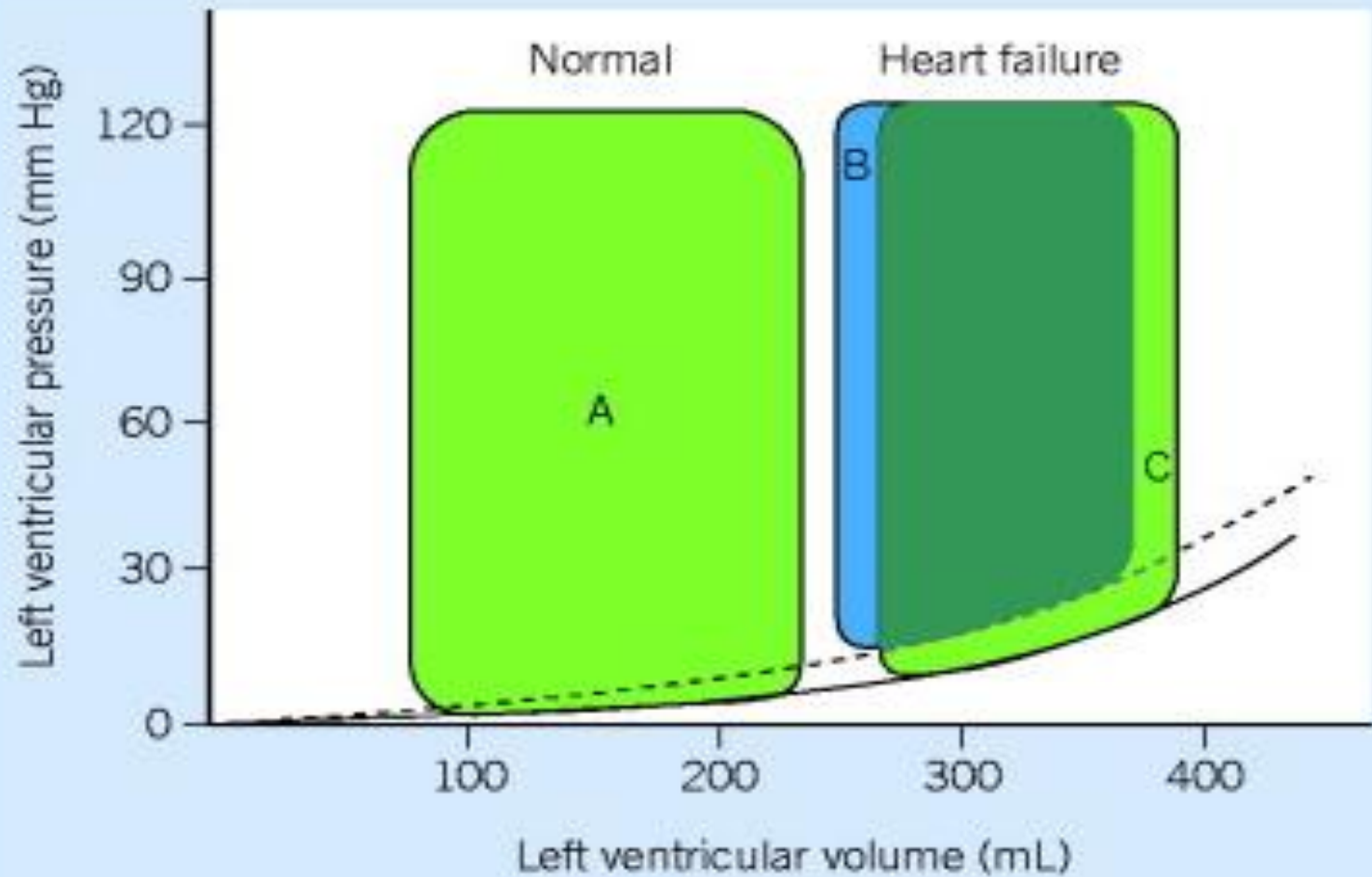
EFFECTS OF VOLUME-PRESSURE OVERLOAD ON CARDIAC STRUCTURE AND FUNCTION



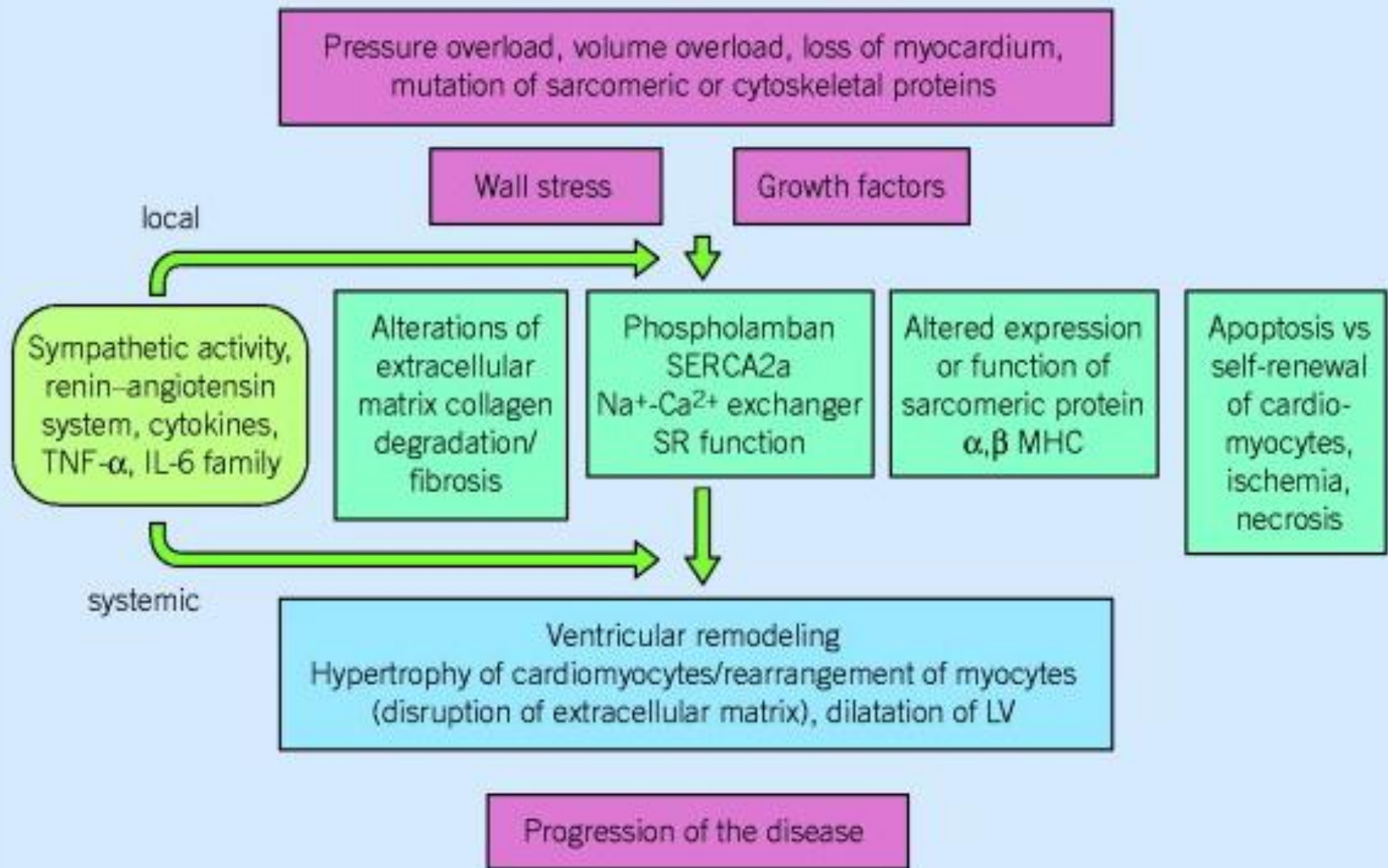
DETRIMENTAL EFFECTS OF ACTIVATION OF THE NEUROHUMORAL AXIS AND CYTOKINES



PRESSURE-VOLUME RELATIONSHIP OF A NORMAL AND A FAILING LEFT VENTRICLE



PATHOPHYSIOLOGY OF HEART FAILURE



DIAGNOSTICO CLINICO SINTOMAS Y SIGNOS

Cuadro 1. Criterios de Framingham para el diagnóstico de IC

Mayores

- Disnea paroxística nocturna
- Ortopnea
- Elevación de la presión yugular
- Rales
- R3
- Cardiomegalia
- Edema pulmonar en la Rx de tórax
- Pérdida de 4,5 kg de peso con el tratamiento para IC

Menores

- Edema bilateral
- Tos nocturna
- Disnea con mínimos esfuerzos
- Hepatomegalia
- Derrame pleural
- Taquicardia (> 120 lpm)

Diagnóstico

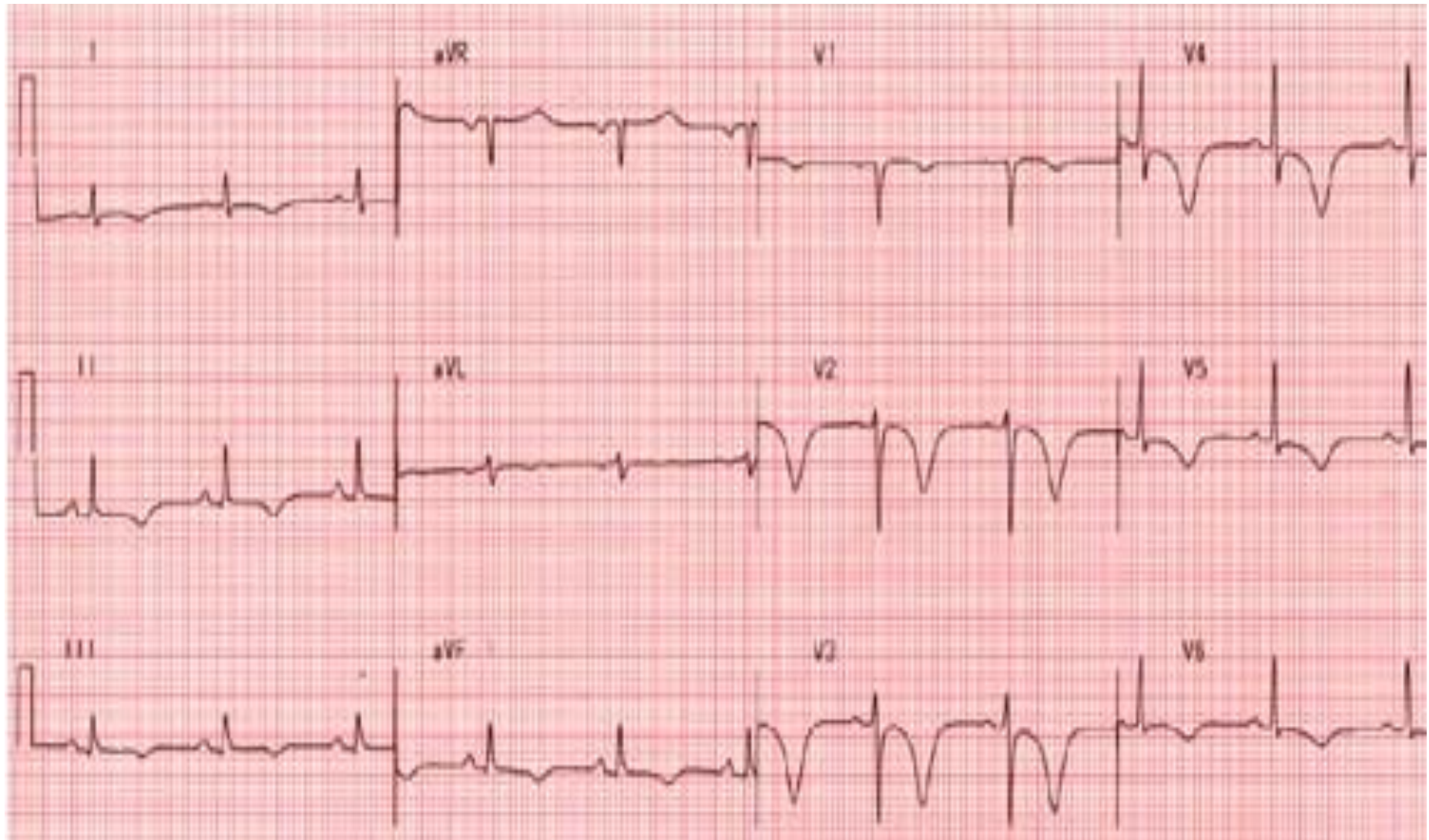
Dos criterios mayores o uno mayor y dos menores
100% de sensibilidad y 78% de especificidad

Adaptado de Senni M, Tribouilloy CM, Rodeheffer RJ et al. Circulation 1998; 98:2282. Y de McKee PA, Castelli WP, McNamara PM, Kannel WB. N Engl J Med 1971; 85:1441.

DIAGNOSTICO

- ELECTROCARDIOGRAMA : Ritmo y conducción eléctrica, Hipertrofia y ondas
- RADIOGRAFIA DE TORAX
- LABORATORIO
Creatinina , glicemia, enzimas hepáticas. Hemograma, TSH + T4 y electrolitos
- TROPONINO y BNP.
- ECOCARDIOGRAMA TT, TE, ESTRÉS: Función sistólica y diastólica, estado valvular, volúmenes, presiones y contractilidad
- GAMAGRAFIA REPOSO, ESTRÉS, VENTRICULOGRAMA
- RESONANCIA NUCLEAR MAGNETICA
- CATETERISMO (PCI)

DIAGNOSTICO



DIAGNOSTICO



figura 1. En un estudio multicéntrico sobre 880 pacientes, el edema alveolar e intersticial y la cefalización vascular presentaron una especificidad $> 90\%$, pero sólo la cardiomegalia ($ICT > 0,55$) presentó una sensibilidad $> 50\%$ ¹⁸. ICT: índice cardiorácico

DIAGNOSTICO

○ ECOCARDIOGRAFIA:

ECOCARDIOGRAFIA TT

Anatomía cardiaca: Volúmenes, geometría, masa.

Función cardiaca: Motilidad, función valvular, presión de AP, pericardio.

ECOCARDIOGRAFIA TE

Enfermedad valvular Compleja

Sospecha de Endocarditis

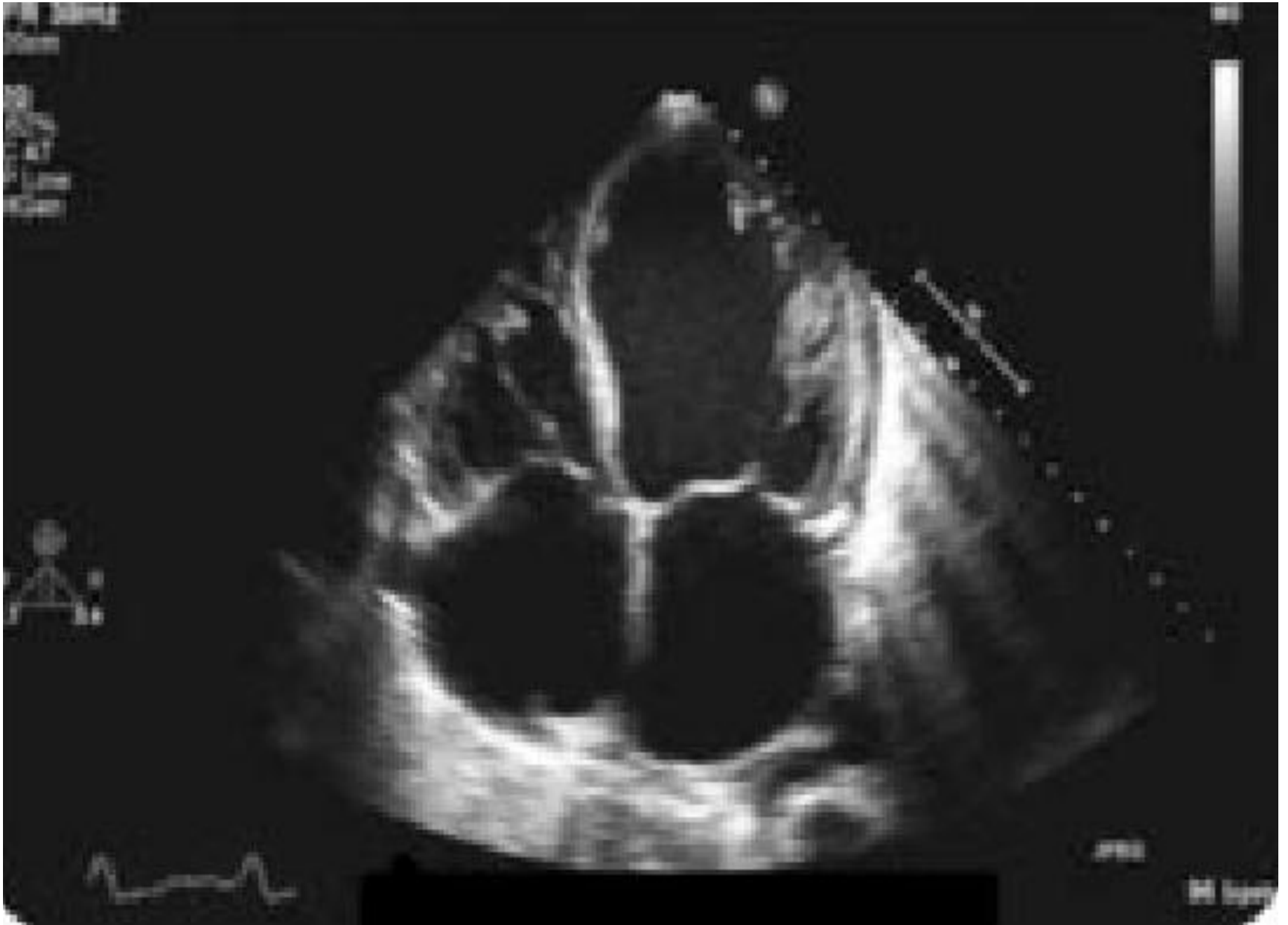
Enfermedad cardiaca congénita

Presencia de trombos en apéndice atrial izquierdo en FA

ECOCARDIOGRAFIA DE ESTRÉS

Con ejercicio o farmacológica identifica la presencia y extensión de Isquemia inducida y áreas de viabilidad miocárdica

DIAGNOSTICO



DIAGNOSTICO

○ GAMAGRAFIA REPOSO, ESTRÉS, VENTRICULOGRAMA

TOMOGRAFIA COMPUTADA CON EMISION DE FOTON UNICO y VENTRICULOGRAFIA CON RADIONUCLIDOS (SPECT):

Indicada para evaluar isquemia y viabilidad si se sospecha CAD, provee información, Diagnostica y pronostica, función y volúmenes ventriculares. radiación ionizante.

TOMOGRAFIA COMPUTADA CON EMISION DE POSITRONES (PET):

Sola o con CT evalúa isquemia y viabilidad

Limitaciones: disponibilidad, radiación y costos.

ANGIOGRAFIA CORONARIA:

Considerar en presencia de angina con historia de CAD, estudio no invasivo positivo

Para isquemia, isquemia potencialmente reversible o ante HF aguda con inestabilidad

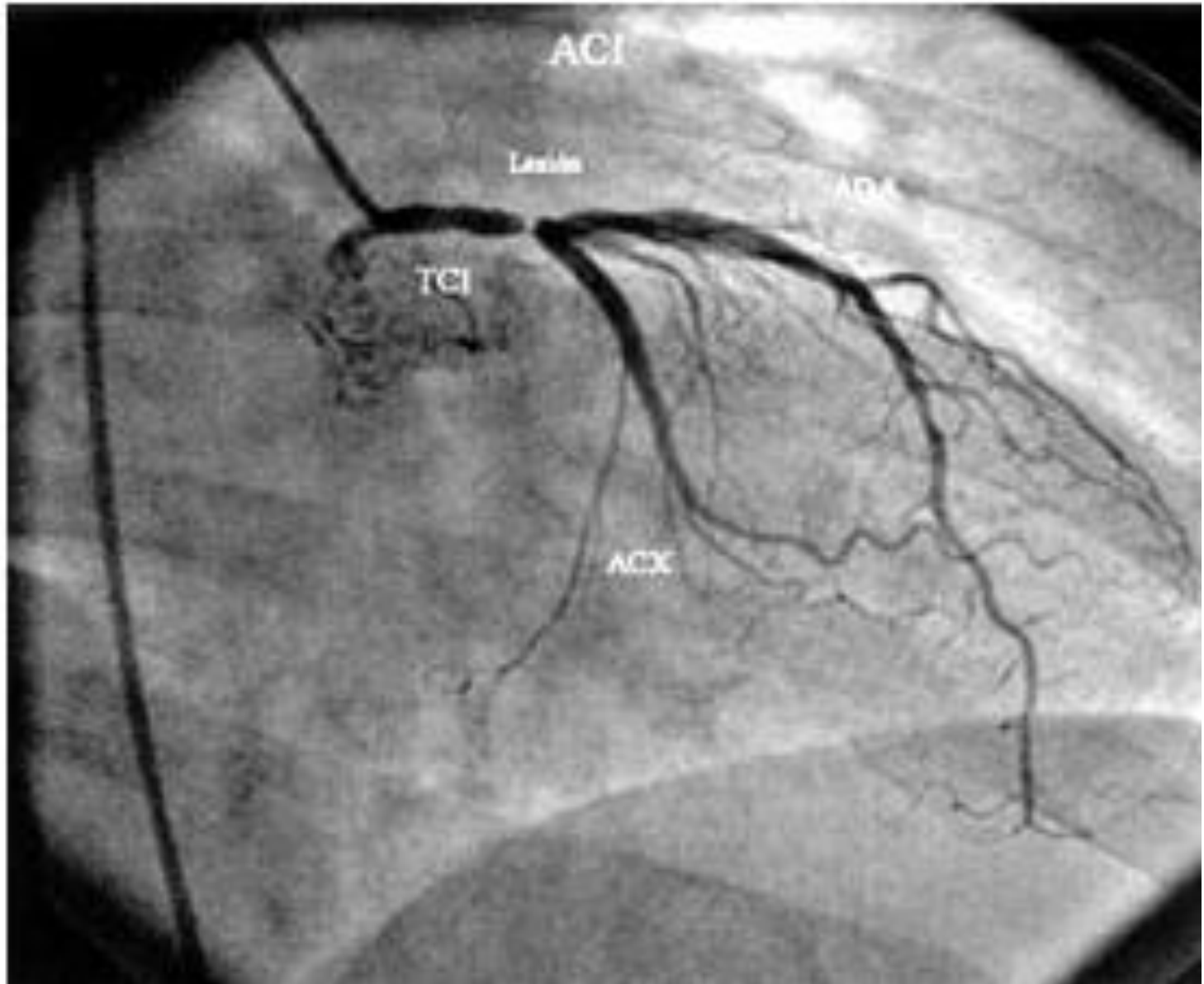
Hemodinámica o edema pulmonar y sospecha de evento coronario. En enfermedad

Valvular cuando se planea corrección quirúrgica.

TOMOGRAFIA COMPUTARIZADA (TC):

Como método no invasivo para visualizar anatomía coronaria.

DIAGNOSTICO



DIAGNOSTICO

RESONANCIA NUCLEAR MAGNETICA

Es considerada como el **GOLD STANDART** en cuanto a precisión y reproducibilidad en relación A volúmenes, masa y motilidad de pared. Es la mejor alternativa en pacientes sin diagnostico por Ecocardiografía.

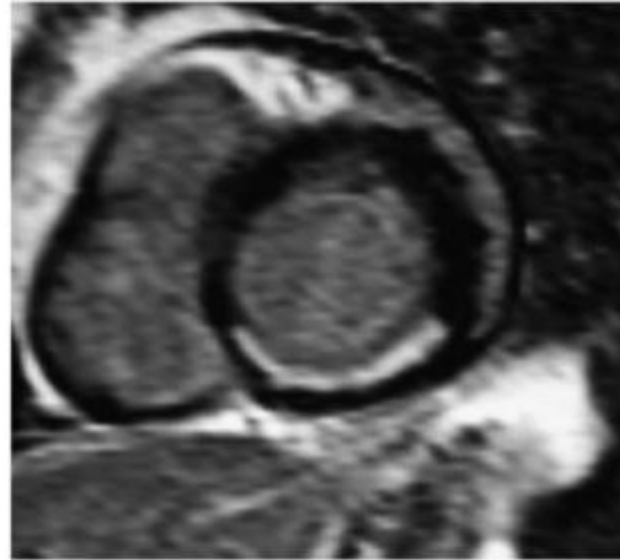
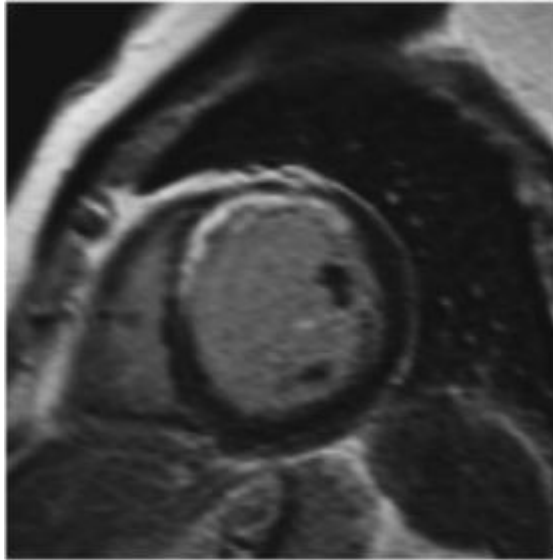
Indicaciones:

- Identificación de enfermedades inflamatorias e infiltrativas
- Sospecha de tumores cardiacos
- Sospecha de cardiomiopatías
- Sospecha de enfermedad pericárdica
- Enfermedades cardiacas congénitas complejas

Limitaciones:

- Falta de disponibilidad
- Implante de ciertas prótesis o implantes metálicos
- Tasa de filtración glomerular < 30 ml / min si uso de Gadolinio
- Costos.

DIAGNOSTICO



DIAGNOSTICO

Otras Investigaciones

BIOPSIA ENDOMIOCARDICA

- Objetivo diagnostico en cardiomiopatías restrictivas o infiltrativas, sospecha de
- Miocarditis.

TEST DE EJERCICIOS / consumo de oxigeno /ergoespirometria/caminata de 6 minutos

Si normal, excluye diagnostico de HF sintomática.

Indicado para evaluar origen cardiogenico vs pulmonar de síntomas de disnea y fatiga cuando se evalúa intercambio gaseoso.

EVALUACIÓN GENETICA

En cardiomiopatías Hipertróficas o dilatadas idiopáticas y Bloqueo AV o Historia Familiar de MS inexplicada prematura cuando un CDI podría estar indicado.

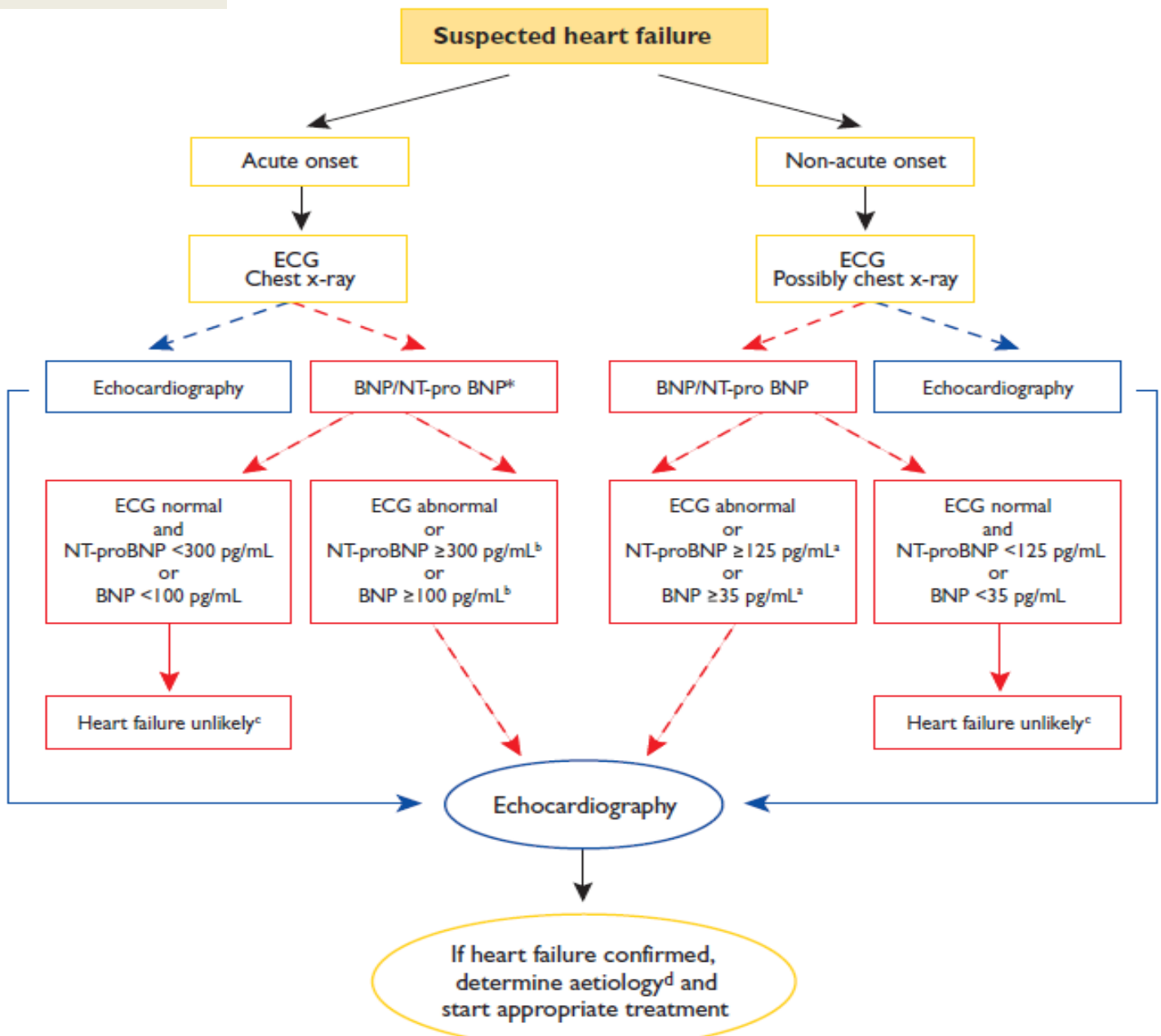
MONITOREO ELCTROCARDIOGRAFICO AMBULATORIO (HOLTER)

Ante síntomas sugestivos de arritmia o bradicardia (palpitaciones o sincope)

Monitoreo de FV en pacientes con FA paroxística, episodios silentes de isquemia y bradicardia,

Disturbios de conducción que puedan causar o exacerbar la HF.

DIAGNOSTICO



STAGE A
At high risk for HF but without structural heart disease or symptoms of HF.

STAGE B
Structural heart disease but without signs or symptoms of HF.

STAGE C
Structural heart disease with prior or current symptoms of HF.

STAGE D
Refractory HF requiring specialized interventions.

e.g.: Patients with:
-hypertension
-atherosclerotic disease
-diabetes
-obesity
-metabolic syndrome
or
Patients
-using cardiotoxins
-with FHx CM

e.g.: Patients with:
-previous MI
-LV remodeling including LVH and low EF
-asymptomatic valvular disease

e.g.: Patients with:
-known structural heart disease and
-shortness of breath and fatigue, reduced exercise tolerance

e.g.: Patients who have marked symptoms at rest despite maximal medical therapy (e.g., those who are recurrently hospitalized or cannot be safely discharged from the hospital without specialized interventions)

Structural heart disease

Development of symptoms of HF

Refractory symptoms of HF at rest

THERAPY

GOALS
-Treat hypertension
-Encourage smoking cessation
-Treat lipid disorders
-Encourage regular exercise
-Discourage alcohol intake, illicit drug use
-Control metabolic syndrome

DRUGS
-ACEI or ARB in appropriate patients (see text) for vascular disease or diabetes

THERAPY

GOALS
-All measures under Stage A

DRUGS
-ACEI or ARB in appropriate patients (see text)
-Beta-blockers in appropriate patients (see text)

THERAPY

GOALS
-All measures under Stages A and B
-Dietary salt restriction

DRUGS FOR ROUTINE USE
-Diuretics for fluid retention
-ACEI
-Beta-blockers

DRUGS IN SELECTED PATIENTS
-Aldosterone antagonist
-ARBs
-Digitalis
-Hydralazine/nitrates

DEVICES IN SELECTED PATIENTS
-Biventricular pacing
-Implantable defibrillators

THERAPY

GOALS
-Appropriate measures under Stages A, B, C
-Decision re: appropriate level of care

OPTIONS
-Compassionate end-of-life care/hospice
-Extraordinary measures
• heart transplant
• chronic inotropes
• permanent mechanical support
• experimental surgery or drugs

Table 2 New York Heart Association functional classification based on severity of symptoms and physical activity

Class I	No limitation of physical activity. Ordinary physical activity does not cause undue breathlessness, fatigue, or palpitations.
Class II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in undue breathlessness, fatigue, or palpitations.
Class III	Marked limitation of physical activity. Comfortable at rest, but less than ordinary physical activity results in undue breathlessness, fatigue, or palpitations.
Class IV	Unable to carry on any physical activity without discomfort. Symptoms at rest can be present. If any physical activity is undertaken, discomfort is increased.

Falla cardiaca **SI**

Evaluación inicial completa:

Clase funcional, estadificación y cardiopatía de base bien definida



PLAN DE MANEJO

Manejo medico optimo - Clínica de Falla Cardiaca

GUIAS

soporte - acompañamiento - acceso - coordinación

Excellent

Functional Status

SUPPORTIVE CARE

2

3

1

HEART FAILURE CARE

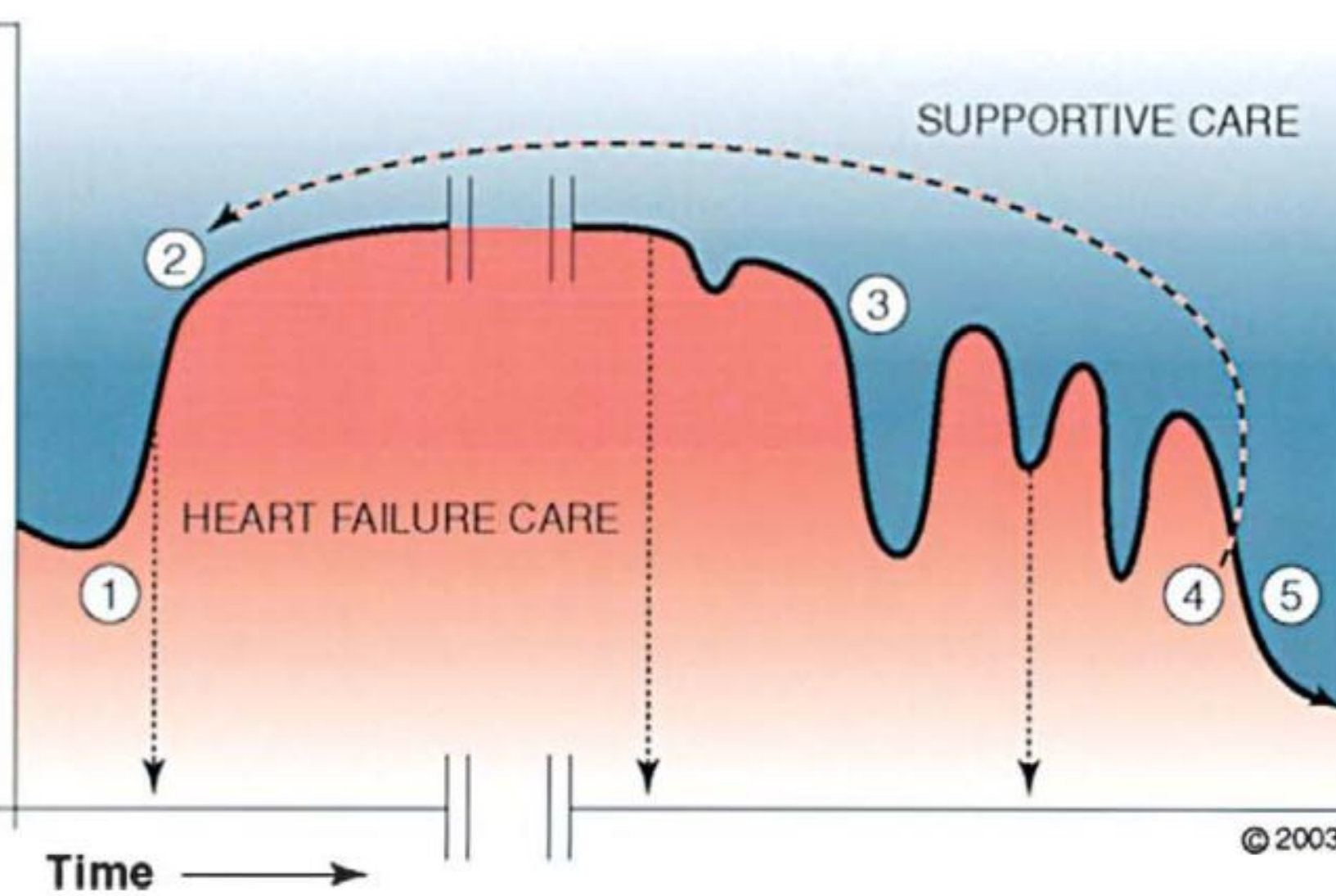
4

5

Death

Time

© 2003



Tratamiento medico

OBJETIVOS:

- 1. Aliviar los signos y síntomas*
- 2. Prevenir hospitalizaciones*
- 3. Mejorar la sobrevida*

Tratamiento medico



Tratamiento

CLINICA DE FALLA CARDIACA

- Medico optimo

BB

**IECA/AR
A II**

MRAS

- Cirugía de falla cardiaca: revascularización miocárdica, reconstrucción ventricular, valvuloplastia
- TRC-DAI
- Trasplante de corazón
- Aparatos de soporte ventricular / corazón artificial total
- Células madre, terapia génica

Beta bloqueadores

- **CIBIS II**
- **Cardiac Insuficiency Bisoprolol Study**
- **COPERNICUS**
- **Carvedilol Prospective Randomized Cumulative Survival**
- **MERIT – HF**
- **Metoprolol Randomized Intervention Trial in Congestive HF**
 - **Randomizados cerca de 9000 pacientes con falla cardiaca sintomática**
 - **Leve a severa a placebo o a Beta Bloqueador (Bisoprolol, Carvedilol o Metoprolol succinato). Mas del 90 % tenían Inh. De la ECA**

En general mostraron RRR de mortalidad 34 %, hospitalización en un 28 – 36 % en el primer año de iniciado del tratamiento. Resultados soportados Por otros estudios como el SENIOR en > 70 años con FEV > 35 % en quienes RRR de muerte y hospitalización cardiovascular en 14 %

Effects on total mortality and sudden death in patients with HF-REF

US Carvedilol
(n=1014)

CIBIS-II
(n=2647)

MERIT-HF
(n=3991)

Total

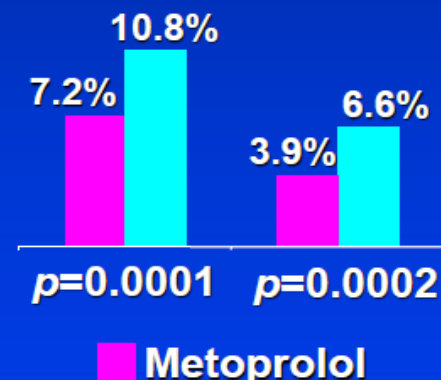
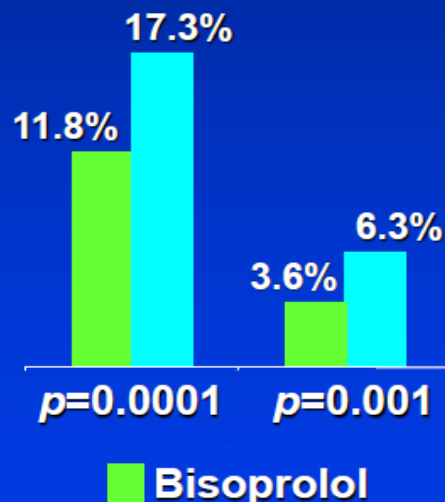
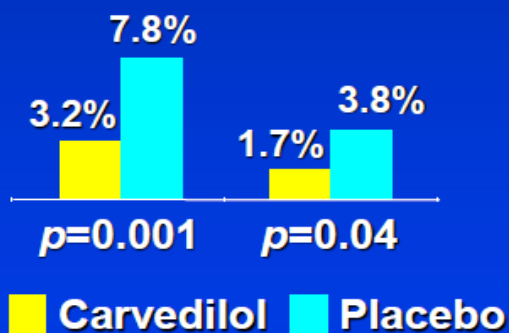
Sudden

Total

Sudden

Total

Sudden



US Carv Program. *N Engl J Med* 1996;334:1349-1355
CIBIS-II. *Lancet*, 1999; 353:9-13
MERIT-HF. *Lancet* 1999; 353:2001-2007

Tratamiento medico 2

Inhibidores de la enzima convertidora de Angiotensina (IECA)

CONSENSUS Study

Cooperative North scandinavian Enalapril Survival Study

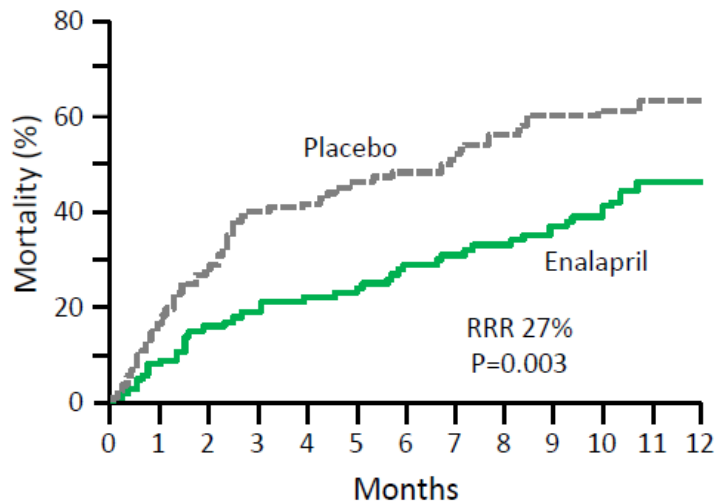
SOLVD Study

Study of Left Ventricular Dysfunction treatment

Trials comparing an ACE inhibitor to placebo in patients with HF-REF

CONSENSUS

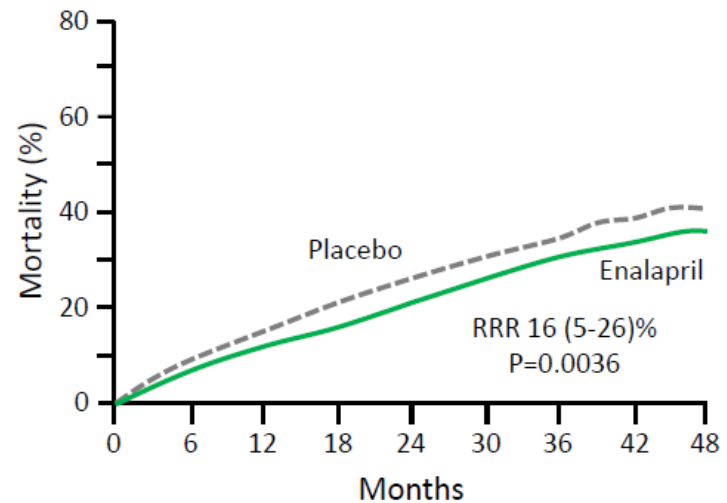
253 NYHA class IV patients
3% β -blocker/53% MRA



The CONSENSUS Trial Study Group. *N Engl J Med.* 1987;316:1429-1435.

SOLVD-T

2569 mainly NYHA class II/III patients
7% β -blocker



The SOLVD Investigators. *N Engl J Med.* 1991;325:293-302.

RRR

26 % en muerte
27 % en HF Hospital

ATLAS Trial Assessment of Treatment with Lisinopril And Survival

3164 pacientes con moderada a severa HF

RRR de 15 % en muerte y hospitalización a altas dosis

SOLVD Prevention = asintomáticos con disfunción sistólica

RRR 20 % en muerte y Hospitalización por HF

SAVE Survival And Ventricular Enlargement (Captopril)

AIRE Acute Infarction Ramipril Efficacy (Ramipril)

TRACE Trandolapril Cardiac Evaluation (Trandolapril)

PRECAUCIONES:

Empeoramiento de la función renal

Hiperkalemia, tos, angioedema, Hipotensión sintomática

Recomienda en potasio normal y Depuraciones > 30 ml / min o Cr. < 2.5 mg

Antagonistas de Receptores Mineralo corticoides

Espironolactona y Eplerenone

RALES: Randomized **A**ldactone **E**valuation **S**tudy

1663 pacientes con FEV < 35 % y CF NYHA III – IV

Placebo vs Espironolactona 25 á 50 mg día

RRR de muerte 30 % y Hospitalización 35 % a 24 meses

The **NEW ENGLAND**
JOURNAL of MEDICINE

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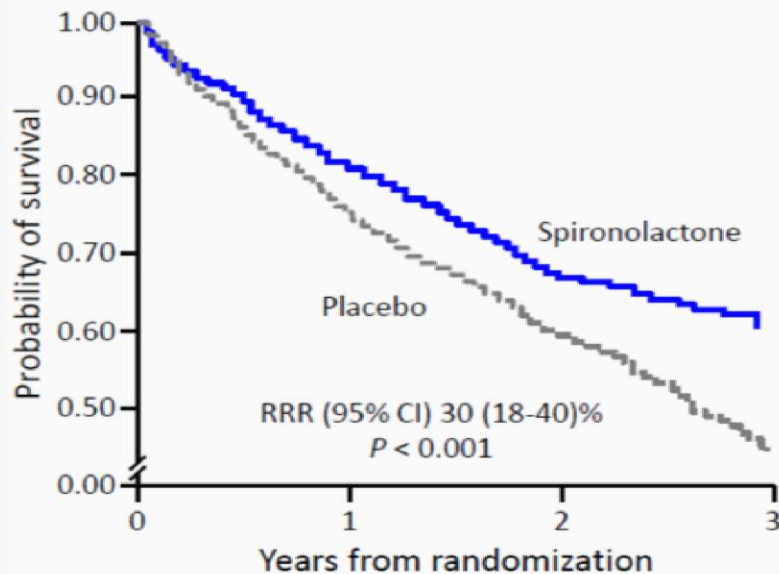
**Eplerenone in Patients with Systolic Heart Failure
and Mild Symptoms**

Faiez Zannad, M.D., Ph.D., John J.V. McMurray, M.D., Henry Krum, M.B., Ph.D., Dirk J. van Veldhuisen, M.D., Ph.D., Karl Swedberg, M.D., Ph.D., Harry Shi, M.S., John Vincent, M.B., Ph.D., Stuart J. Pocock, Ph.D., and Bertram Pitt, M.D., for the EMPHASIS-HF Study Group*

Trials comparing an aldosterone/MR antagonist to placebo (added to an ACE-I and a BB) in HF-REF

RALES

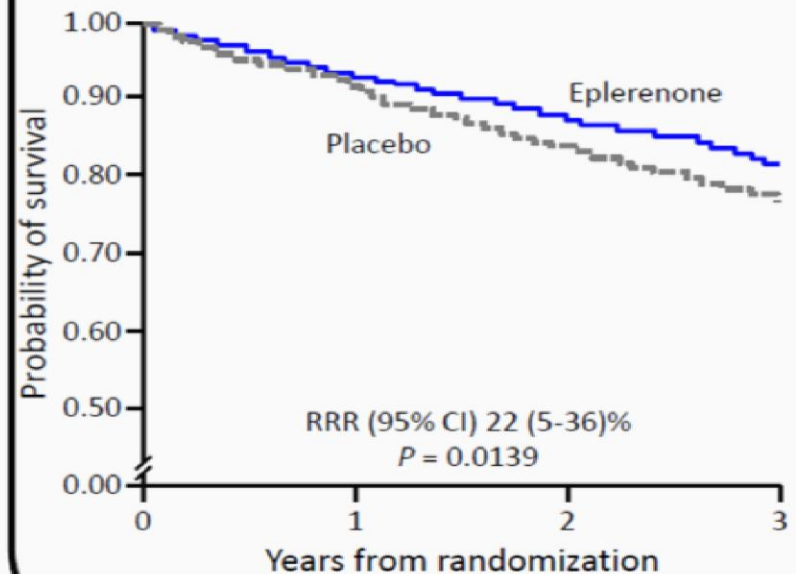
1663 NYHA class III/IV patients
95% ACE-I/10% β -blocker



Pitt B, et al. *N Engl J Med.* 1999;341:709-717.

EMPHASIS-HF

2737 NYHA class II patients
93% ACE-I or ARB/87% β -blocker



Zannad F, et al. *N Engl J Med.* 2010;364:11-21.

BLOQUEADORES DE RECEPTORES DE ANGIOTENSINA - BRA II

Alternativa en pacientes intolerantes a los IECA, Es remplazo y no para adición en HF y FEV < 40 % que permanecen sintomáticos A pesar de tratamiento optimo con Inh. ECA y BB, En EMPHASIS-HF y RALES se obtuvo Más disminución de todas las causas de mortalidad, mientras que la adición de BRA no lo consigue.

HEAAL: Hearth failure **E**ndpoint evaluation of **A**ngiotensin II **A**ntagonist **L**osartan

ELITE: Evaluation of **L**osartan **I**n **T**he **E**ldery

ATLAS: Assessment of **T**reatment with **L**isinopril **A**nd **S**urvival Trial

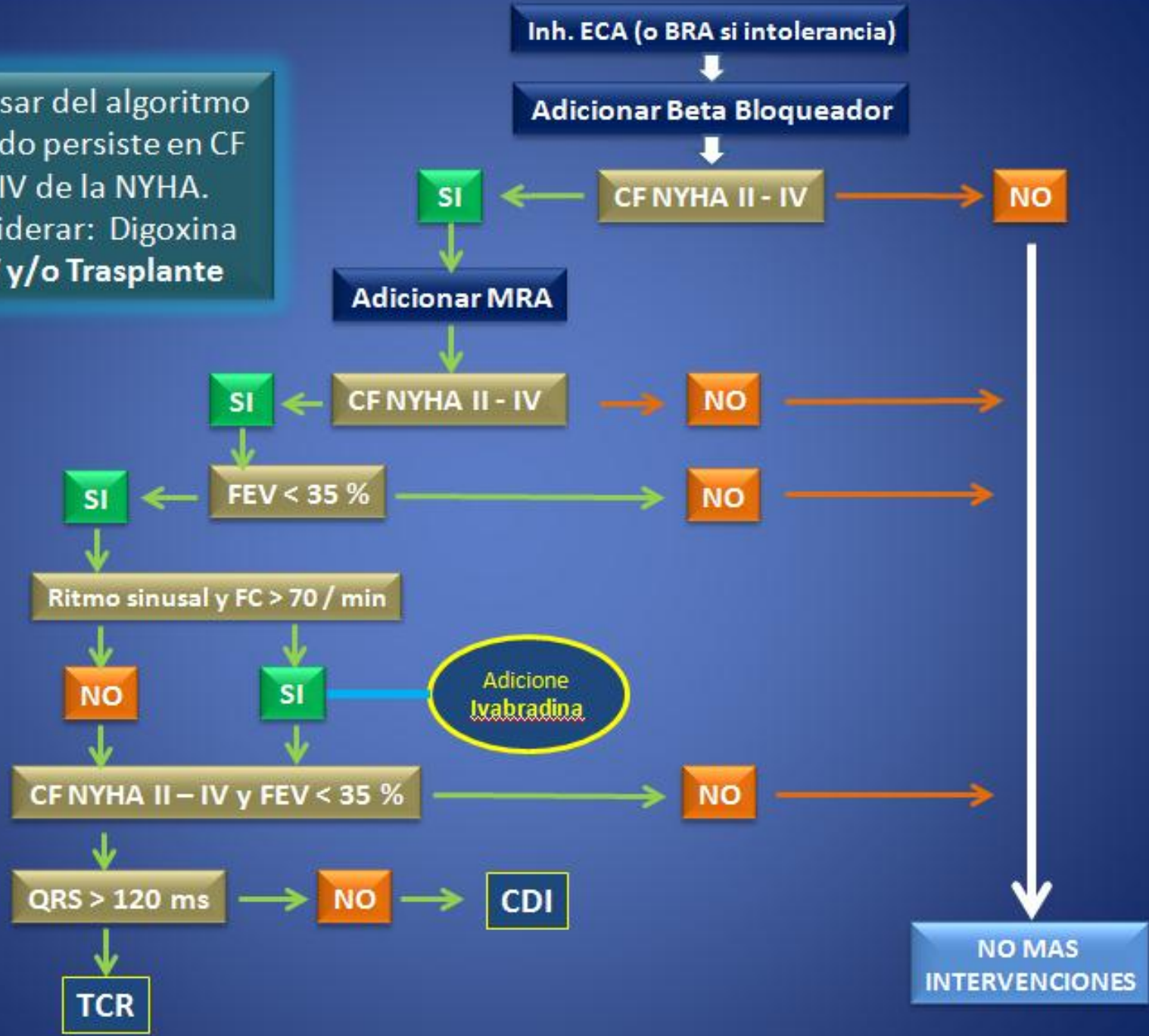
VALIANT: Valsartan **I**n **A**cute myocardial **I**Nfarction **T**rial

OPTIMAL: Optimal **T**herapy **I**n **M**yocardial infarction with the **A**ngiotensin II
Antagonist **L**osartan

Table 14 Evidence-based doses of disease-modifying drugs used in key randomized trials in heart failure (or after myocardial infarction)

	Starting dose (mg)	Target dose (mg)
ACE Inhibitor		
Captopril ^P	6.25 t.i.d.	50 t.i.d.
Enalapril	2.5 b.i.d.	10–20 b.i.d.
Lisinopril ^P	2.5–5.0 o.d.	20–35 o.d.
Ramipril	2.5 o.d.	5 b.i.d.
Trandolapril ^P	0.5 o.d.	4 o.d.
Beta-blocker		
Bisoprolol	1.25 o.d.	10 o.d.
Carvedilol	3.125 b.i.d.	25–50 b.i.d.
Metoprolol succinate (CR/XL)	12.5/25 o.d.	200 o.d.
Nebivolol ^F	1.25 o.d.	10 o.d.
ARB		
Candesartan	4 or 8 o.d.	32 o.d.
Valsartan	40 b.i.d.	160 b.i.d.
Losartan ^{b,c}	50 o.d.	150 o.d.
MRA		
Eplerenone	25 o.d.	50 o.d.
Spirolonolactone	25 o.d.	25–50 o.d.

Si a pesar del algoritmo Aplicado persiste en CF II – IV de la NYHA. Considerar: Digoxina DAV y/o Trasplante



Other treatments with less-certain benefits in patients with symptomatic (NYHA class II–IV) systolic heart failure

Recommendations	Class ^a	Level ^b	Ref ^c
ARB			
Recommended to reduce the risk of HF hospitalization and the risk of premature death in patients with an EF \leq 40% and unable to tolerate an ACE inhibitor because of cough (patients should also receive a beta-blocker and an MRA).	I	A	108, 109
Recommended to reduce the risk of HF hospitalization in patients with an EF \leq 40% and persisting symptoms (NYHA class II–IV) despite treatment with an ACE inhibitor and a beta-blocker who are unable to tolerate an MRA. ^d	I	A	110, 111
Ivabradine			
Should be considered to reduce the risk of HF hospitalization in patients in sinus rhythm with an EF \leq 35%, a heart rate remaining \geq 70 b.p.m., and persisting symptoms (NYHA class II–IV) despite treatment with an evidence-based dose of beta-blocker (or maximum tolerated dose below that), ACE inhibitor (or ARB), and an MRA (or ARB). ^e	IIa	B	112
May be considered to reduce the risk of HF hospitalization in patients in sinus rhythm with an EF \leq 35% and a heart rate \geq 70 b.p.m. who are unable to tolerate a beta-blocker. Patients should also receive an ACE inhibitor (or ARB) and an MRA (or ARB). ^e	IIb	C	–
Digoxin			
May be considered to reduce the risk of HF hospitalization in patients in sinus rhythm with an EF \leq 45% who are unable to tolerate a beta-blocker (ivabradine is an alternative in patients with a heart rate \geq 70 b.p.m.). Patients should also receive an ACE inhibitor (or ARB) and an MRA (or ARB).	IIb	B	113
May be considered to reduce the risk of HF hospitalization in patients with an EF \leq 45% and persisting symptoms (NYHA class II–IV) despite treatment with a beta-blocker, ACE inhibitor (or ARB), and an MRA (or ARB).	IIb	B	113
H-ISDN			
May be considered as an alternative to an ACE inhibitor or ARB, if neither is tolerated, to reduce the risk of HF hospitalization and risk of premature death in patients with an EF \leq 45% and dilated LV (or EF \leq 35%). Patients should also receive a beta-blocker and an MRA.	IIb	B	114, 115
May be considered to reduce the risk of HF hospitalization and risk of premature death in patients in patients with an EF \leq 45% and dilated LV (or EF \leq 35%) and persisting symptoms (NYHA class II–IV) despite treatment with a beta-blocker, ACE inhibitor (or ARB), and an MRA (or ARB).	IIb	B	116
An <i>n</i> -3 PUFA ^f preparation may be considered to reduce the risk of death and the risk of cardiovascular hospitalization in patients treated with an ACE inhibitor (or ARB), beta-blocker, and an MRA (or ARB).	IIb	B	117

Falla cardiaca

○ OPCIONES

MANEJO MEDICO OPTIMO SUFICIENTE CLINICA DE FALLA CARDIACA



CIRUGIA DE FALLA CARDIACA

TERAPIA DE RESINCRONIZACION

CARDIODEFIBRILADOR IMPLANTABLE AUTOMATICO

TRASPLANTE DE CORAZON

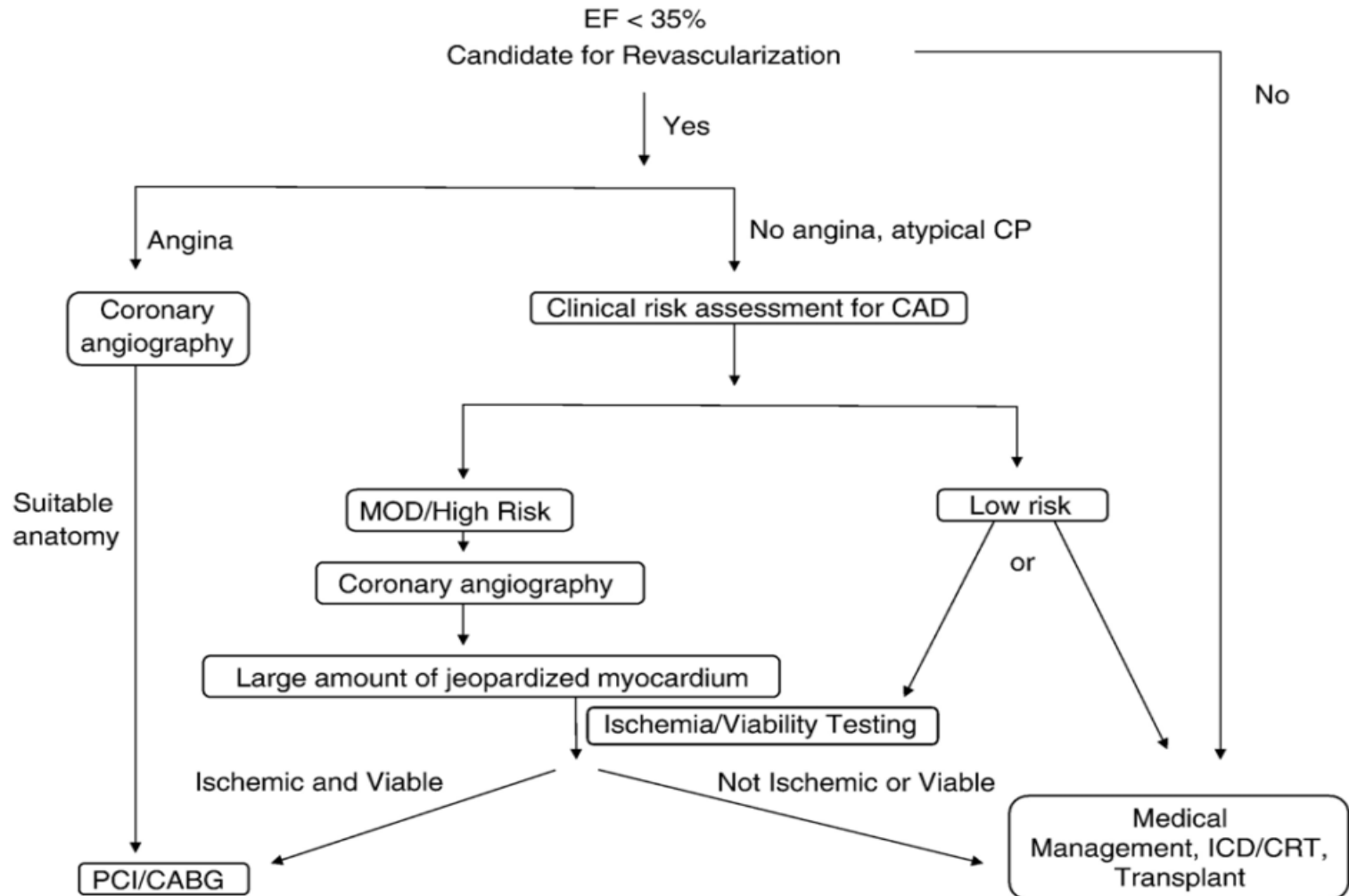
APARATOS DE SOPORTE VENTRICULAR

CORAZON ARTIFICIAL TOTAL

TERAPIA CON CLS MADRE, TERAPIA GENICA

CIRUGIA DE FALLA CARDIACA

Revascularización miocárdica



(Am Heart J 2007;153:S65-S73.)

Falla cardiaca

1. CIRUGIA DE FALLA CARDIACA

Revascularización miocárdica

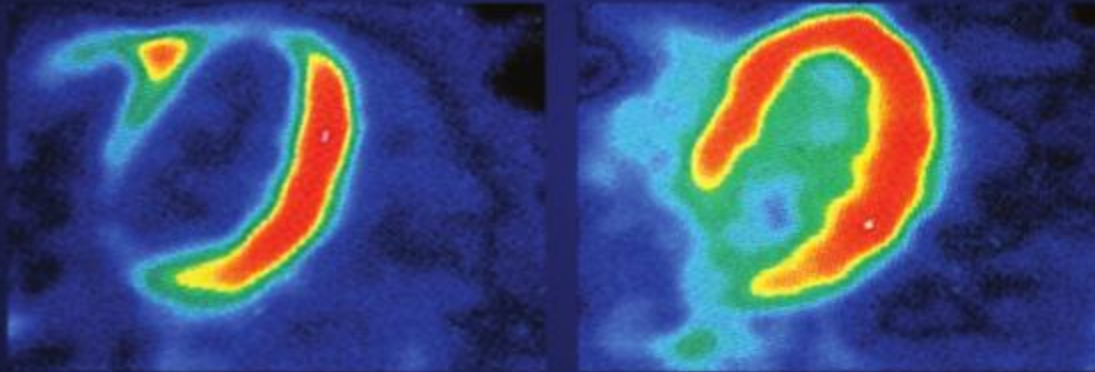
- Relación de **–viabilidad**

Pooled Data from Viability Studies of Bax et al. (18) with Different Techniques to Predict Improvement in LVEF After Revascularization

Technique	No. of studies	% Sensitivity	% Specificity	% NPV	% PPV
¹⁸ F-FDG PET	20	93	58	85	77
²⁰¹ Tl imaging	33	87	55	81	64
^{99m} Tc-labeled tracers	20	81	66	77	71
DSE	32	81	80	85	77

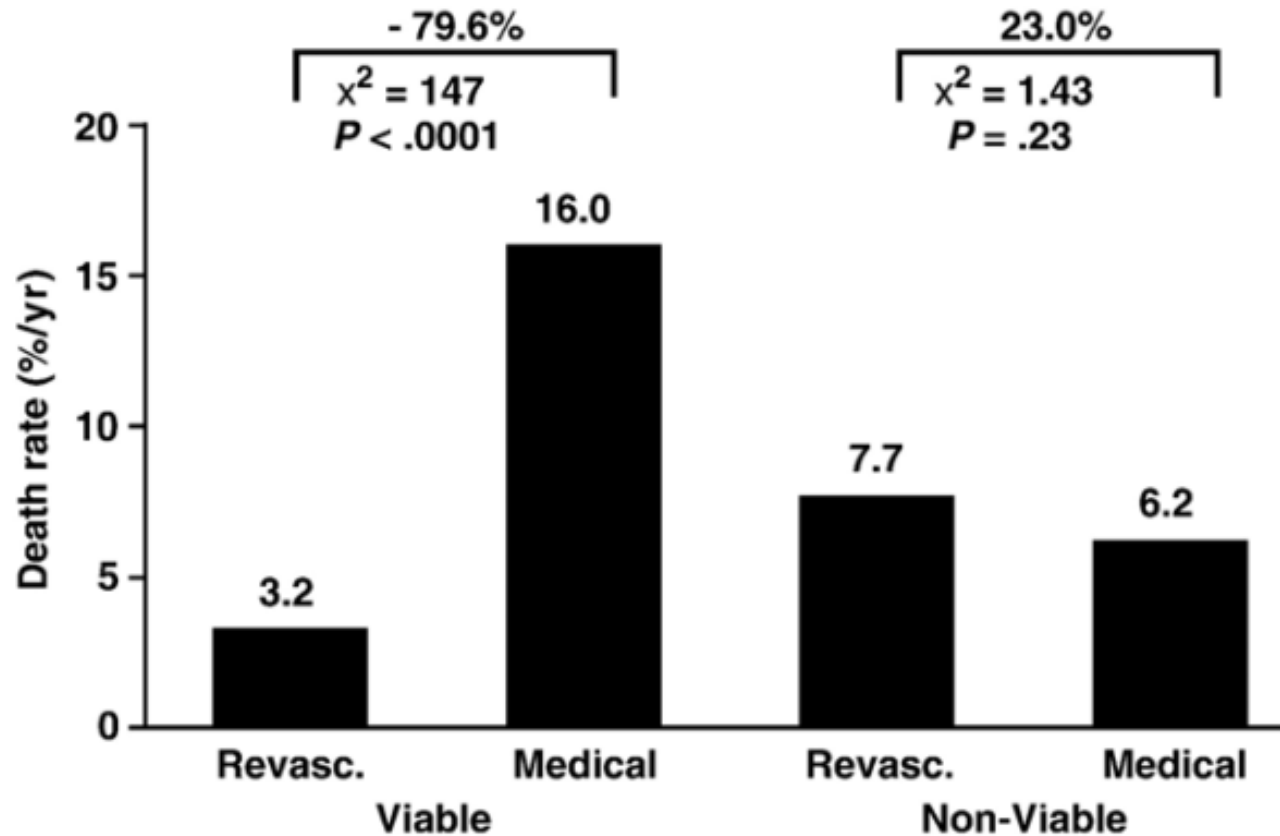
DSE = dobutamine stress echocardiography; NPV = negative predictive value; PPV = positive predictive value.

N13-ammonia - FDG mismatch



CIRUGIA DE FALLA CARDIACA

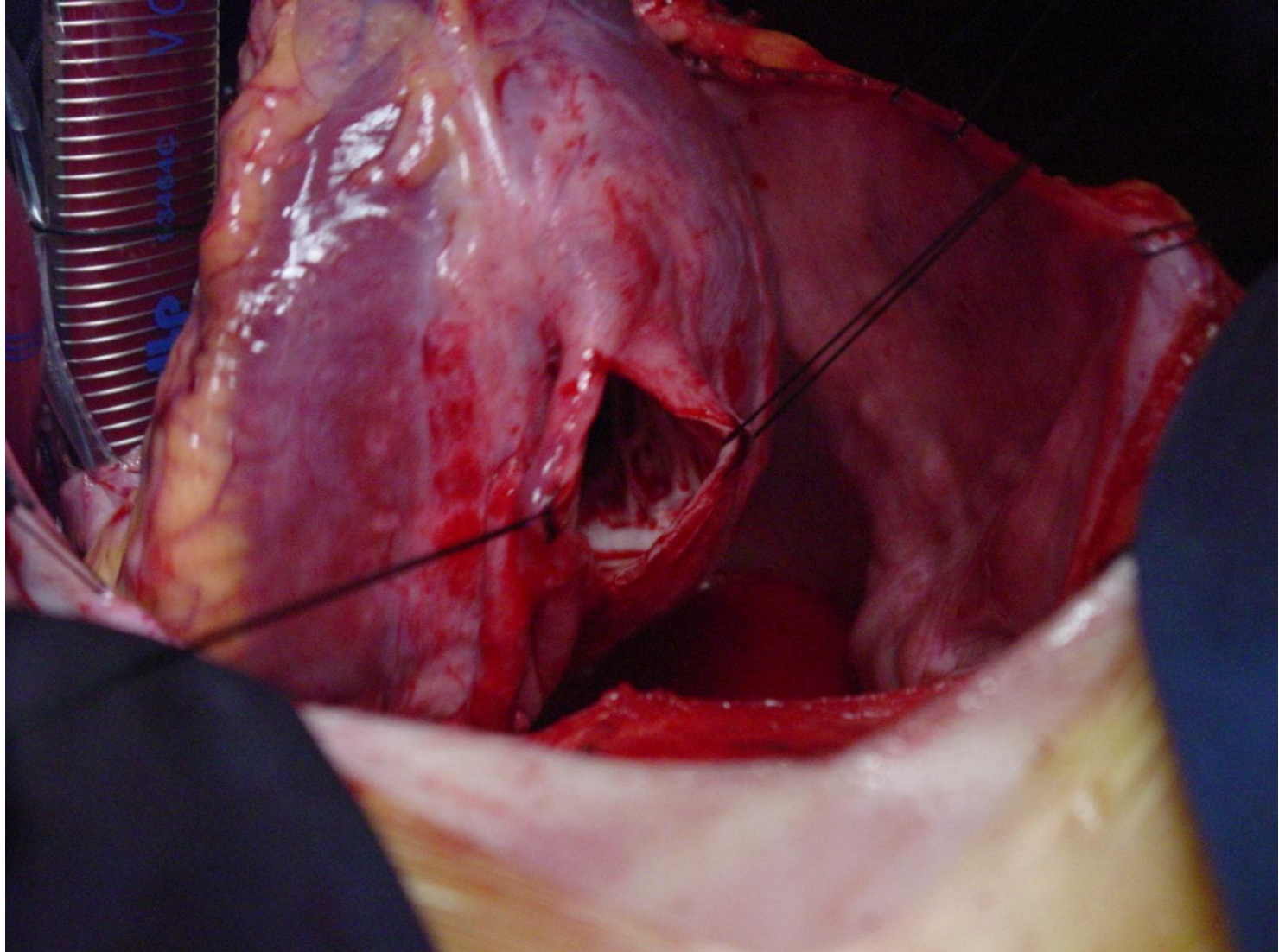
Revascularización miocárdica



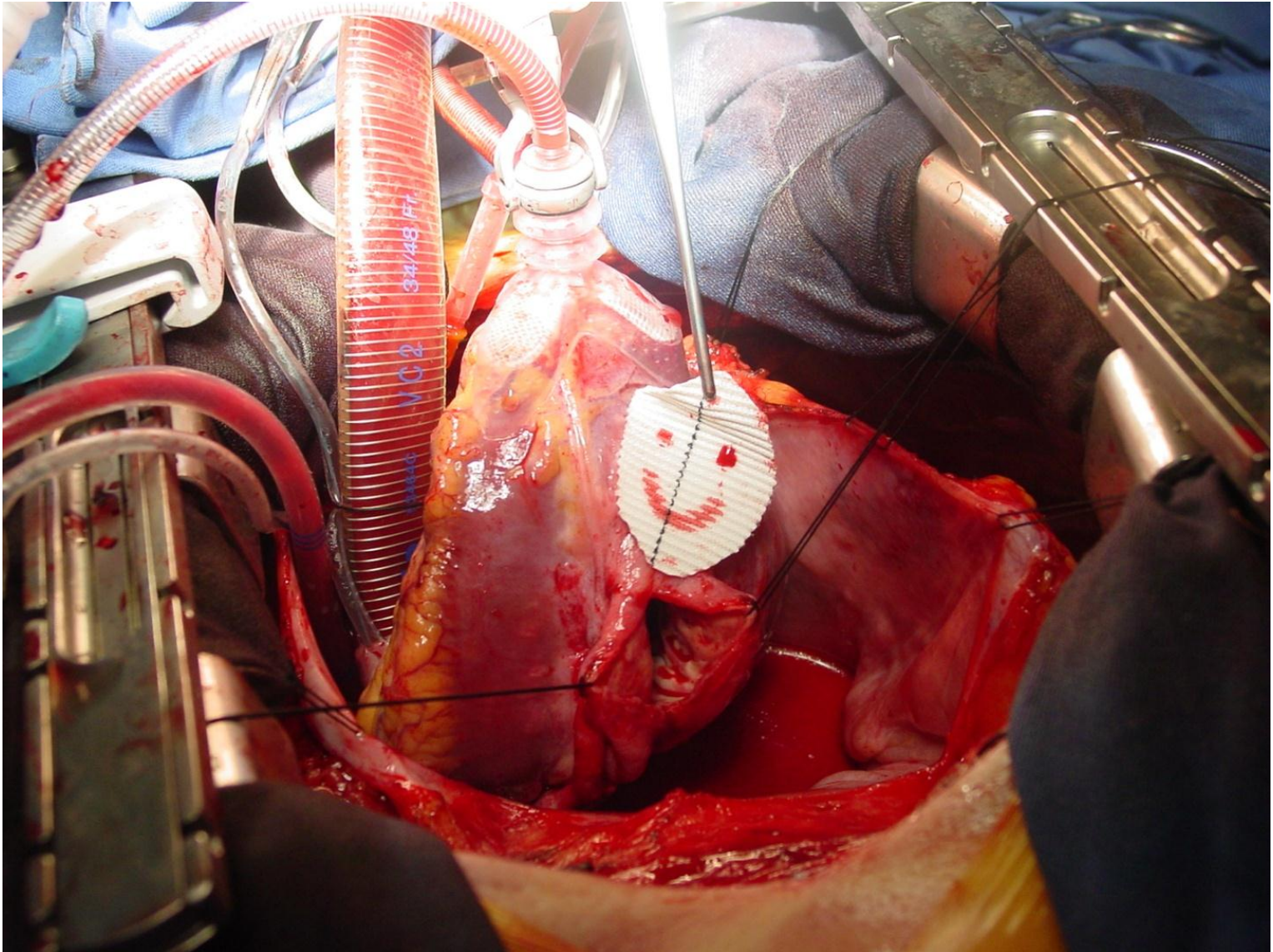
CIRUGIA DE FALLA CARDIACA

- Reconstrucción geométrica de ventrículo
Aneurisectomia con endomiorrafia
- Plastia valvular mitral
- Aparato de soporte ventricular externo
- Myo splint

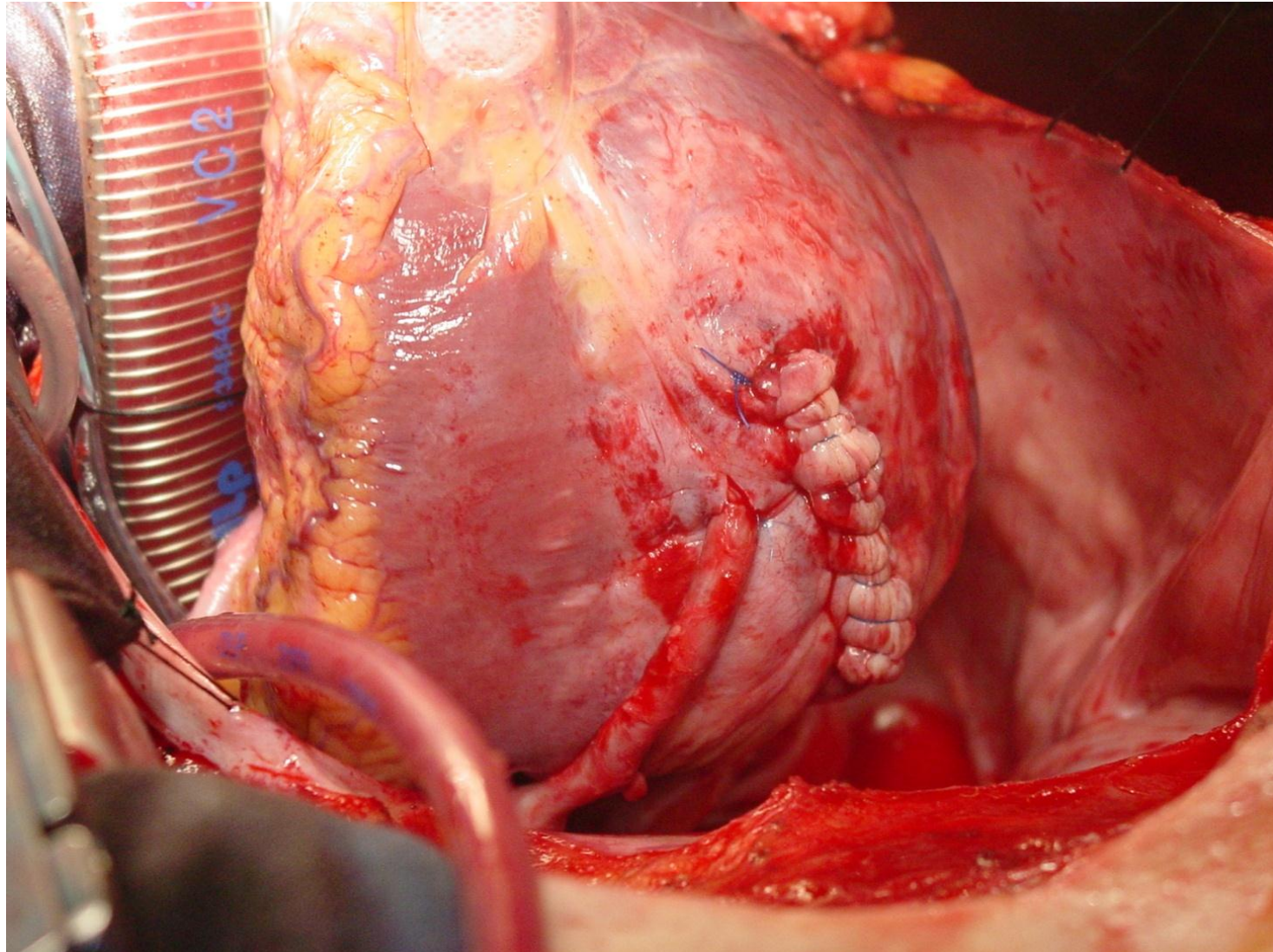
CIRUGIA DE FALLA CARDIACA



CIRUGIA DE FALLA CARDIACA

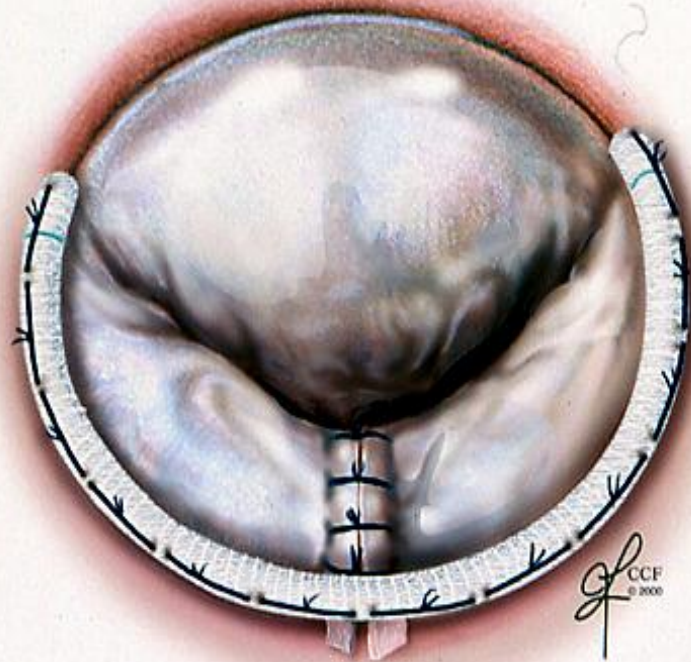


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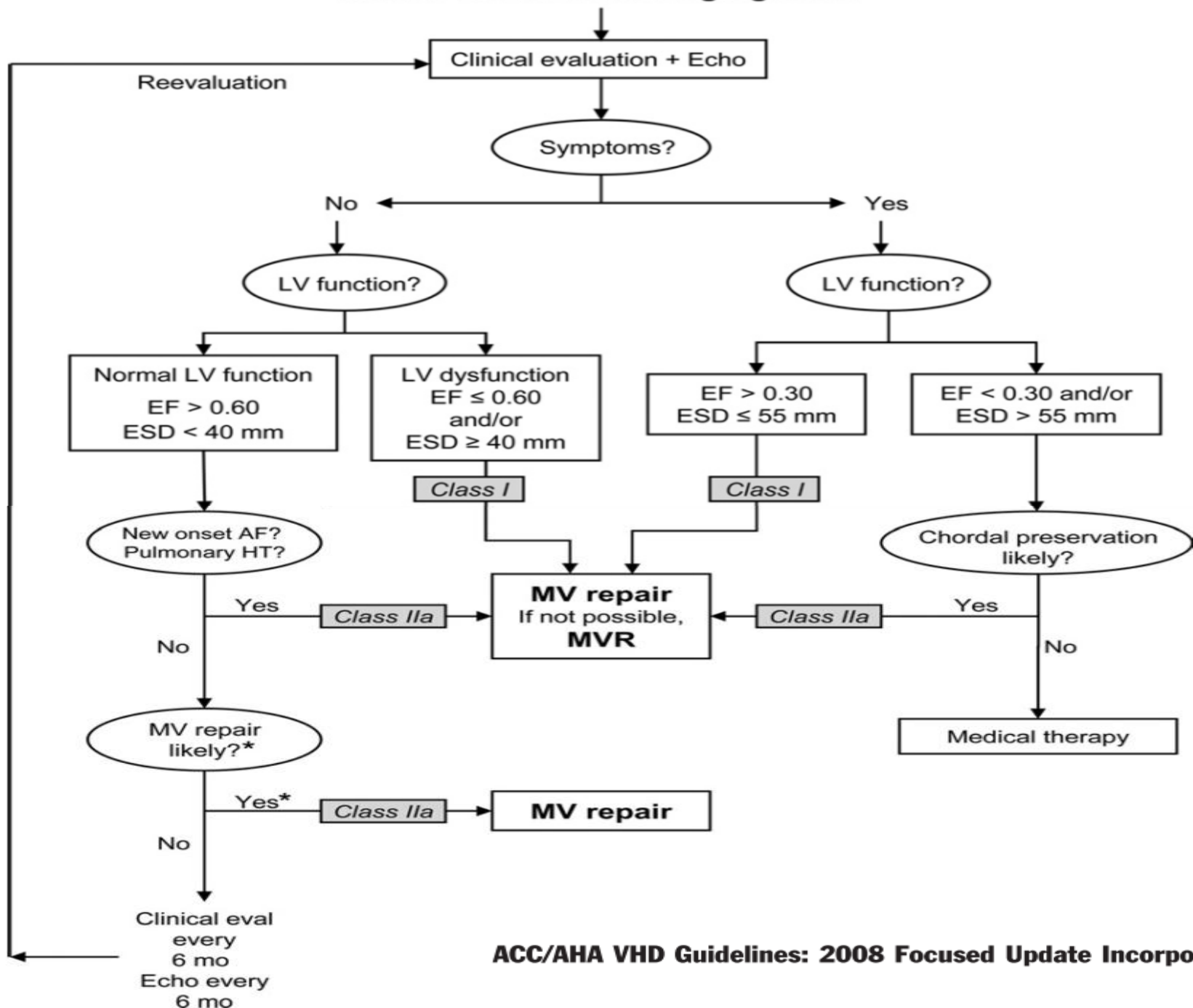


CIRUGIA DE FALLA CARDIACA

Plastia valvular mitral

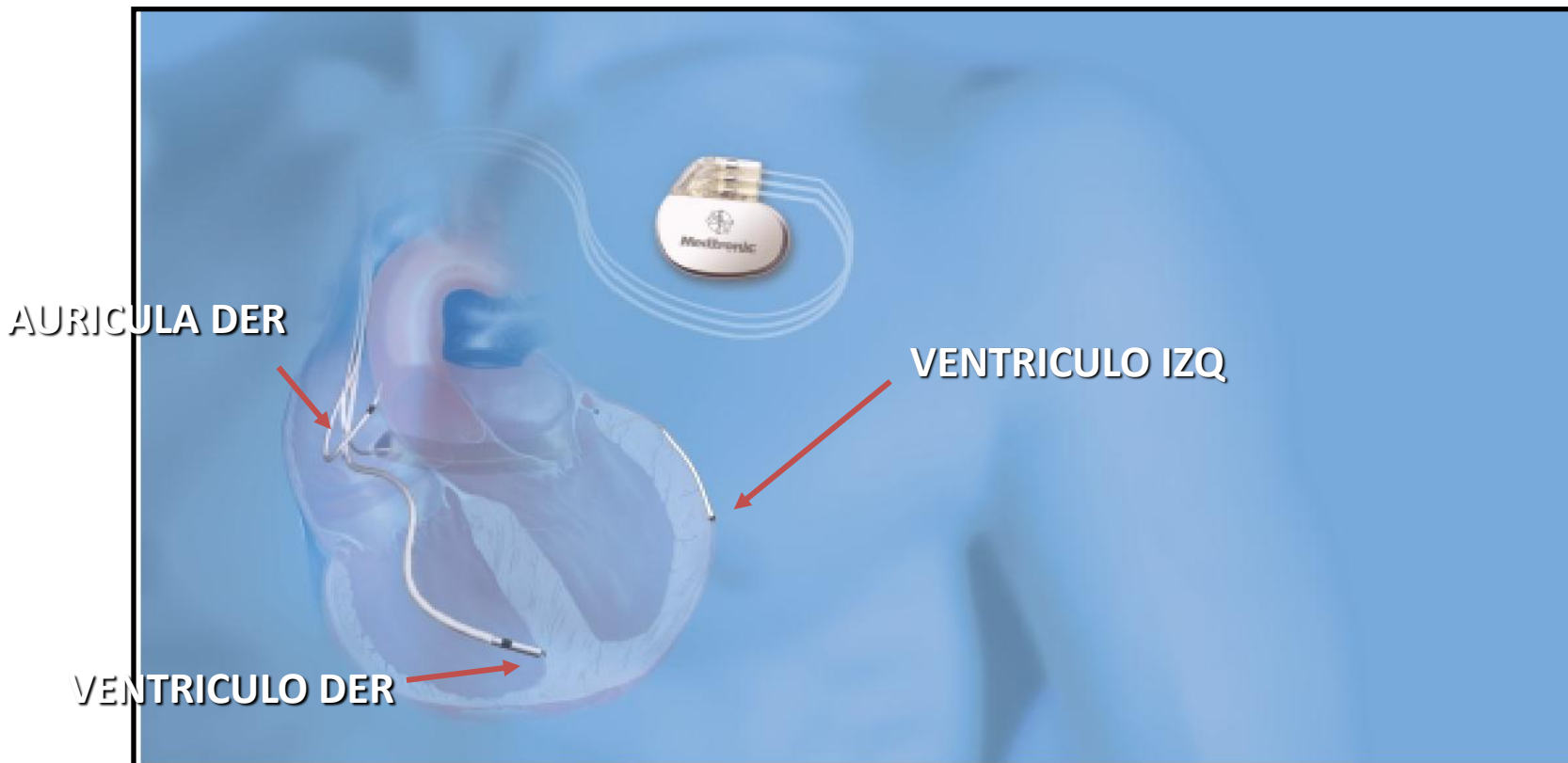


Chronic Severe Mitral Regurgitation



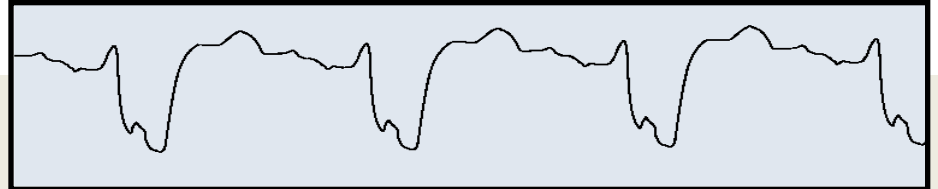
Falla Cardíaca: Terapia de Re sincronización

- ACCESO VENOSO:
(3) ELECTRODOS AURICULA DER - VENTRICULO DER - VIA SENOS VENOSOS



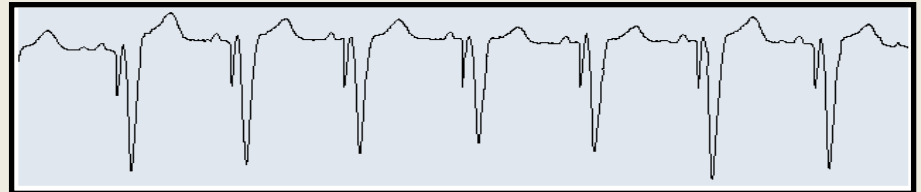
Falla Cardíaca: Terapia de Re sincronización

- ASINCRONIA VENTRICULAR:¹



- Eléctrica: Retardo en la conducción interventricular típico del bloqueo de rama izquierda
- Estructural: Disrupción de la matriz de colágeno deteriorando la eficiencia mecánica y la conducción eléctrica
- Mecánica : Anormalidades regionales de la pared con incremento del trabajo y del stress

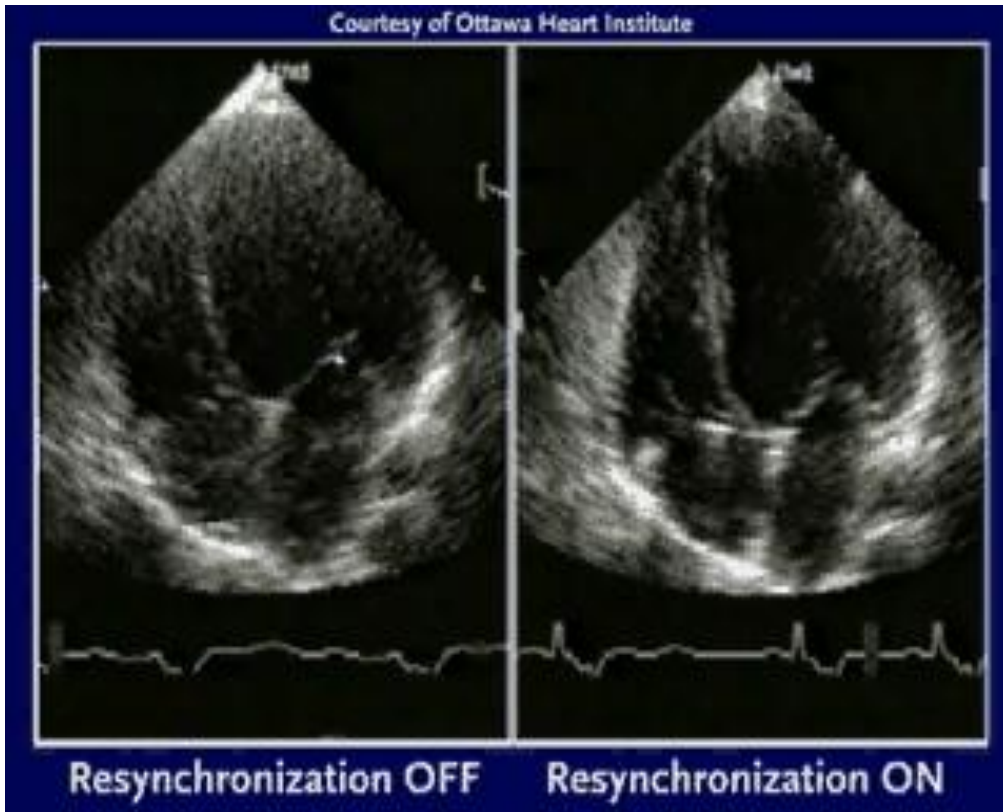
- RESINCRONIZACION CARDIACA:



- Terapéutica de sincronización aurículo biventricular
 - Modificaciones en la secuencia de activación aurículo-ventricular, interventricular e intraventricular en pacientes con asincronía ventricular
 - Complemento a la terapia médica óptima

¹ Tavazzi L. Eur Heart J 2000;21:1211-1214

CONSECUENCIAS CLINICAS DE LA RE SINCRONIZACION VENTRICULAR:



- Movimiento anormal del septo interventricular¹
- Reduccion dP/dt ^{3,4}
- Reduccion de presion pulso⁴
- Reduccion de FE y CO ⁴
- Reduccion tiempo de llenado diastolico^{1,2,4}
- Prolongada insuficiencia mitral^{1,2,4}

¹ Grines CL, Bashore TM, Boudoulas H, et al. *Circulation* 1989;79:845-853.

² Xiao, HB, Lee CH, Gibson DG. *Br Heart J* 1991;66:443-447.

³ Xiao HB, Brecker SJD, Gibson DG. *Br Heart J* 1992;68:403-407.

⁴ Yu C-M, Chau E, Sanderson JE, et al. *Circulation*. 2002;105:438-445.

Falla Cardíaca: Terapia de Re sincronización

Recommendations for the use of CRT where the evidence is strong—patients in sinus rhythm with NYHA functional class III and ambulatory class IV heart failure and a persistently reduced ejection fraction, despite optimal pharmacological therapy

Recommendations	Class ^a	Level ^b	Ref ^c
LBBB QRS morphology CRT-P/CRT-D is recommended in patients in sinus rhythm with a QRS duration of ≥ 120 ms, LBBB QRS morphology, and an EF $\leq 35\%$, who are expected to survive with good functional status for > 1 year, to reduce the risk of HF hospitalization and the risk of premature death.	I	A	156, 157
Non-LBBB QRS morphology CRT-P/CRT-D should be considered in patients in sinus rhythm with a QRS duration of ≥ 150 ms, irrespective of QRS morphology, and an EF $\leq 35\%$, who are expected to survive with good functional status for > 1 year, to reduce the risk of HF hospitalization and the risk of premature death.	IIa	A	156, 157

Falla Cardíaca: Terapia de Re sincronización

Recommendations for the use of CRT where the evidence is strong—patients in sinus rhythm with NYHA functional class II heart failure and a persistently reduced ejection fraction, despite optimal pharmacological therapy

Recommendations	Class ^a	Level ^b	Ref ^c
LBBB QRS morphology CRT, preferably CRT-D is recommended in patients in sinus rhythm with a QRS duration of ≥ 130 ms, LBBB QRS morphology, and an EF $\leq 30\%$, who are expected to survive for >1 year with good functional status, to reduce the risk of HF hospitalization and the risk of premature death.	I	A	154, 155
Non-LBBB QRS morphology CRT, preferably CRT-D should be considered in patients in sinus rhythm with a QRS duration of ≥ 150 ms, irrespective of QRS morphology, and an EF $\leq 30\%$, who are expected to survive for >1 year with good functional status, to reduce the risk of HF hospitalization and the risk of premature death.	IIa	A	154, 155

Falla Cardíaca: Terapia de Re sincronización

Recommendations for the use of CRT where the evidence is uncertain—patients with symptomatic HF (NYHA functional class II–IV) and a persistently reduced EF despite optimal pharmacological therapy and in AF or with a conventional pacing indication

Recommendations	Class ^a	Level ^b	Ref ^c
Patients in permanent AF			
CRT-P/CRT-D may be considered in patients in NYHA functional class III or ambulatory class IV with a QRS duration ≥ 120 ms and an EF $\leq 35\%$, who are expected to survive with good functional status for >1 year, to reduce the risk of HF worsening if: <ul style="list-style-type: none"> • The patient requires pacing because of an intrinsically slow ventricular rate • The patient is pacemaker dependent as a result of AV nodal ablation • The patient's ventricular rate is ≤ 60 b.p.m. at rest and ≤ 90 b.p.m. on exercise. 	IIb	C	–
	IIa	B	163a
	IIb	C	–
Patients with an indication for conventional pacing and no other indication for CRT			
In patients who are expected to survive with good functional status for >1 year: <ul style="list-style-type: none"> • CRT should be considered in those in NYHA functional class III or IV with an EF $\leq 35\%$, irrespective of QRS duration, to reduce the risk of worsening of HF • CRT may be considered in those in NYHA functional class II with an EF $\leq 35\%$, irrespective of QRS duration, to reduce the risk of worsening of HF. 	IIa	C	–
	IIb	C	–

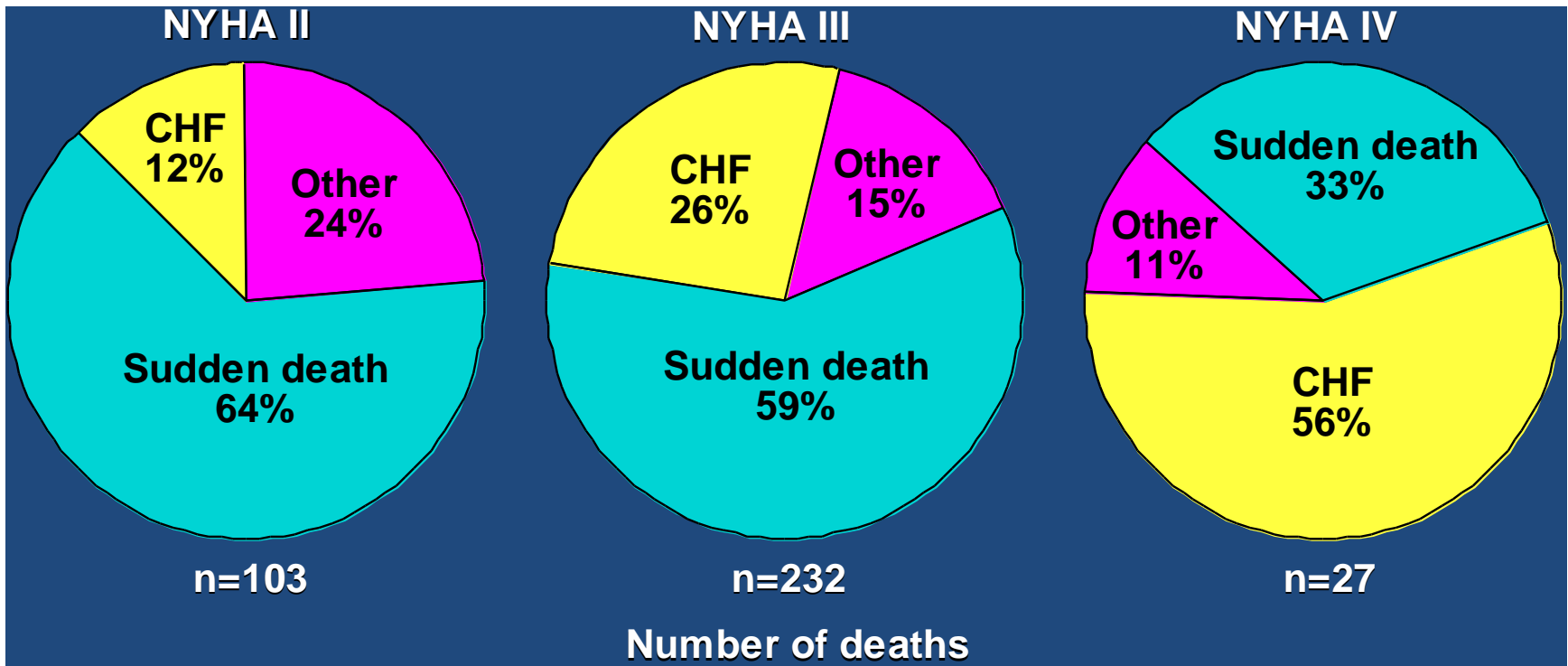
Cardiodesfibrilador CDI

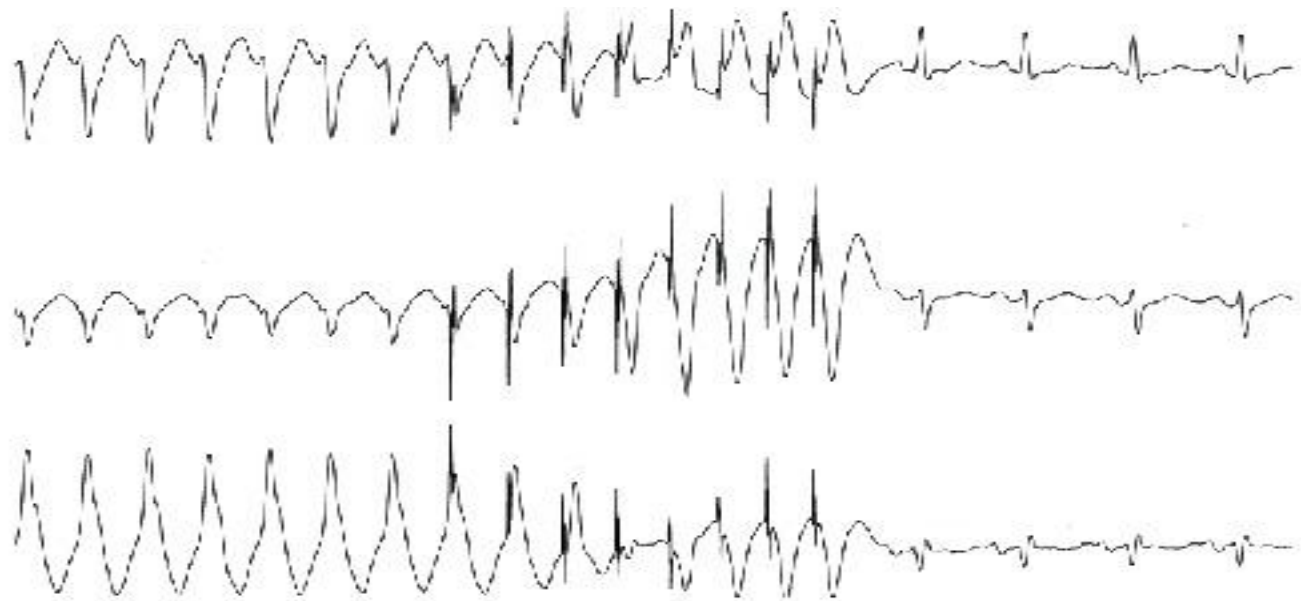
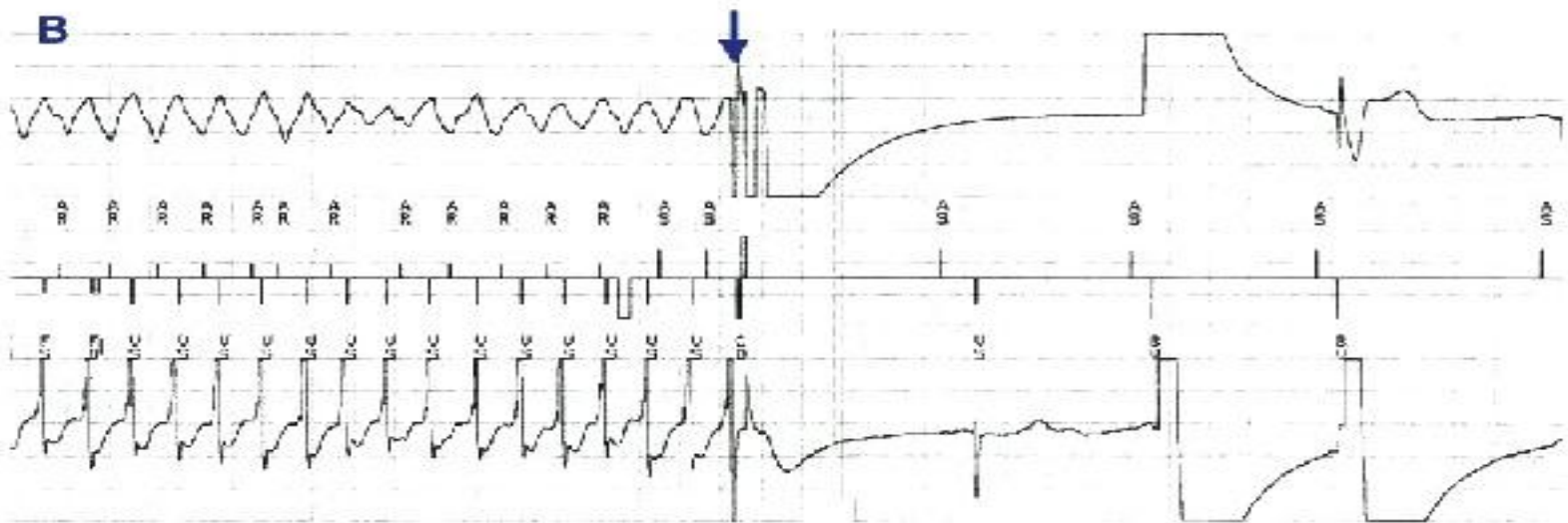


Falla cardiaca:

Cardiodesfibrilador CDI

SEVERIDAD DE ICC Y MODO DE MUERTE



A**B**

Recommendations for the use of implanted cardioverter defibrillators in patients with heart failure

Recommendations	Class ^a	Level ^b	Ref ^c
Secondary prevention An ICD is recommended in a patient with a ventricular arrhythmia causing haemodynamic instability, who is expected to survive for >1 year with good functional status, to reduce the risk of sudden death.	I	A	144–147
Primary prevention An ICD is recommended in a patient with symptomatic HF (NYHA class II–III) and an EF ≤35% despite ≥3 months of treatment with optimal pharmacological therapy, who is expected to survive for >1 year with good functional status, to reduce the risk of sudden death	I	A	148, 149
(i) Ischaemic aetiology and >40 days after acute myocardial infarction	I	A	148, 149
(ii) Non-ischaemic aetiology	I	B	149

Falla cardiaca

TRASPLANTE DE CORAZON

Table 23 Heart transplantation: indications and contraindications

Patients to consider	End-stage heart failure with severe symptoms, a poor prognosis, and no remaining alternative treatment options
	Motivated, well informed, and emotionally stable
	Capable of complying with the intensive treatment required post-operatively
Contraindications	Active infection
	Severe peripheral arterial or cerebrovascular disease
	Current alcohol or drug abuse
	Treated cancer in previous 5 years
	Unhealed peptic ulcer
	Recent thrombo-embolism
	Significant renal failure (e.g. creatinine clearance <50 mL/min)
	Significant liver disease
	Systemic disease with multiorgan involvement
	Other serious co-morbidity with poor prognosis
	Emotional instability or untreated mental illness
	High, fixed pulmonary vascular resistance (>4–5 Wood Units and mean transpulmonary gradient >15 mmHg)

Recomendación para Trasplante de Corazón: : Pacientes Evaluados que no Aplican

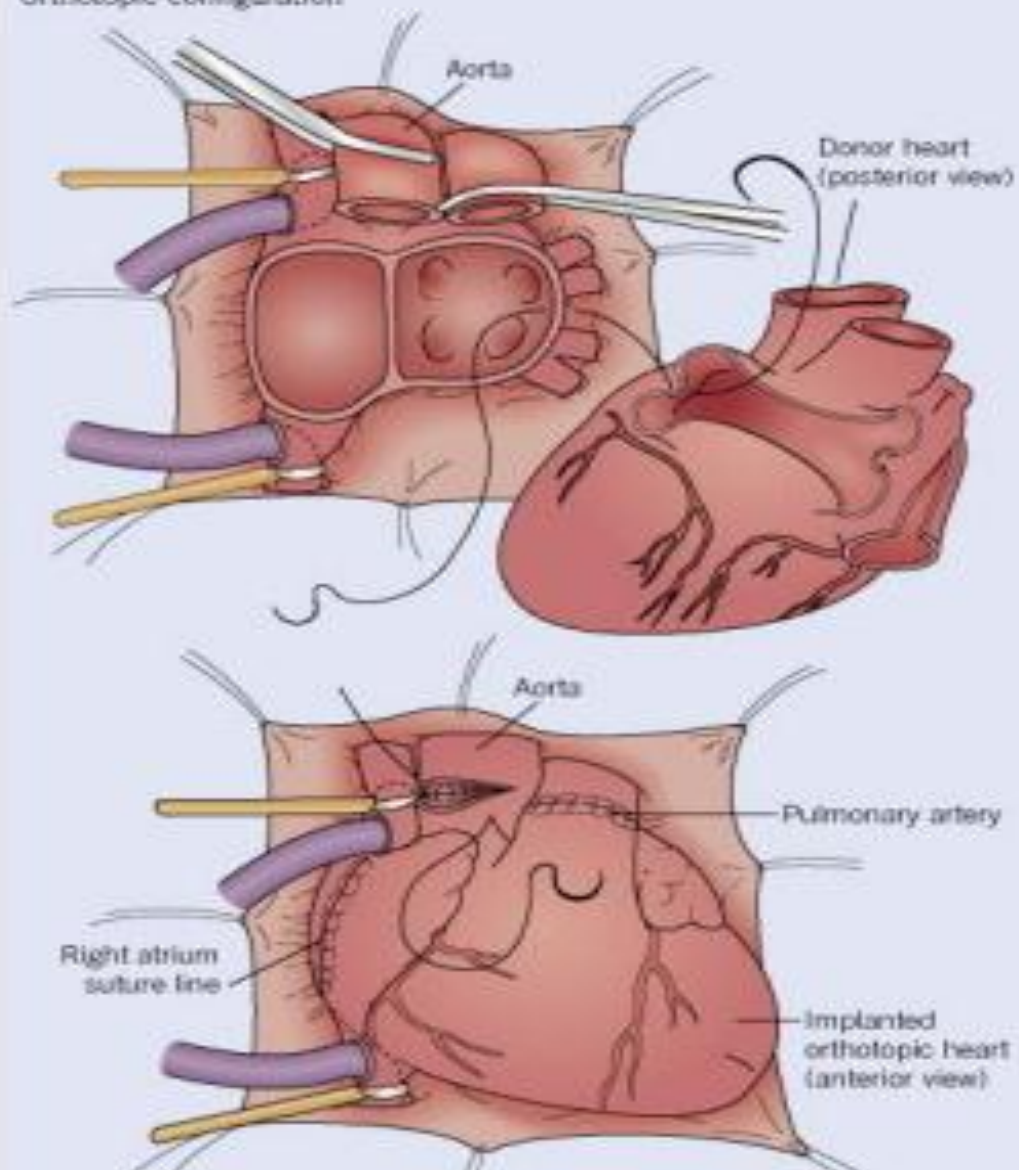
Paso 1 : Evaluación salud mental y trabajo social

Paso 2 : Cateterismo cardiaco derecho

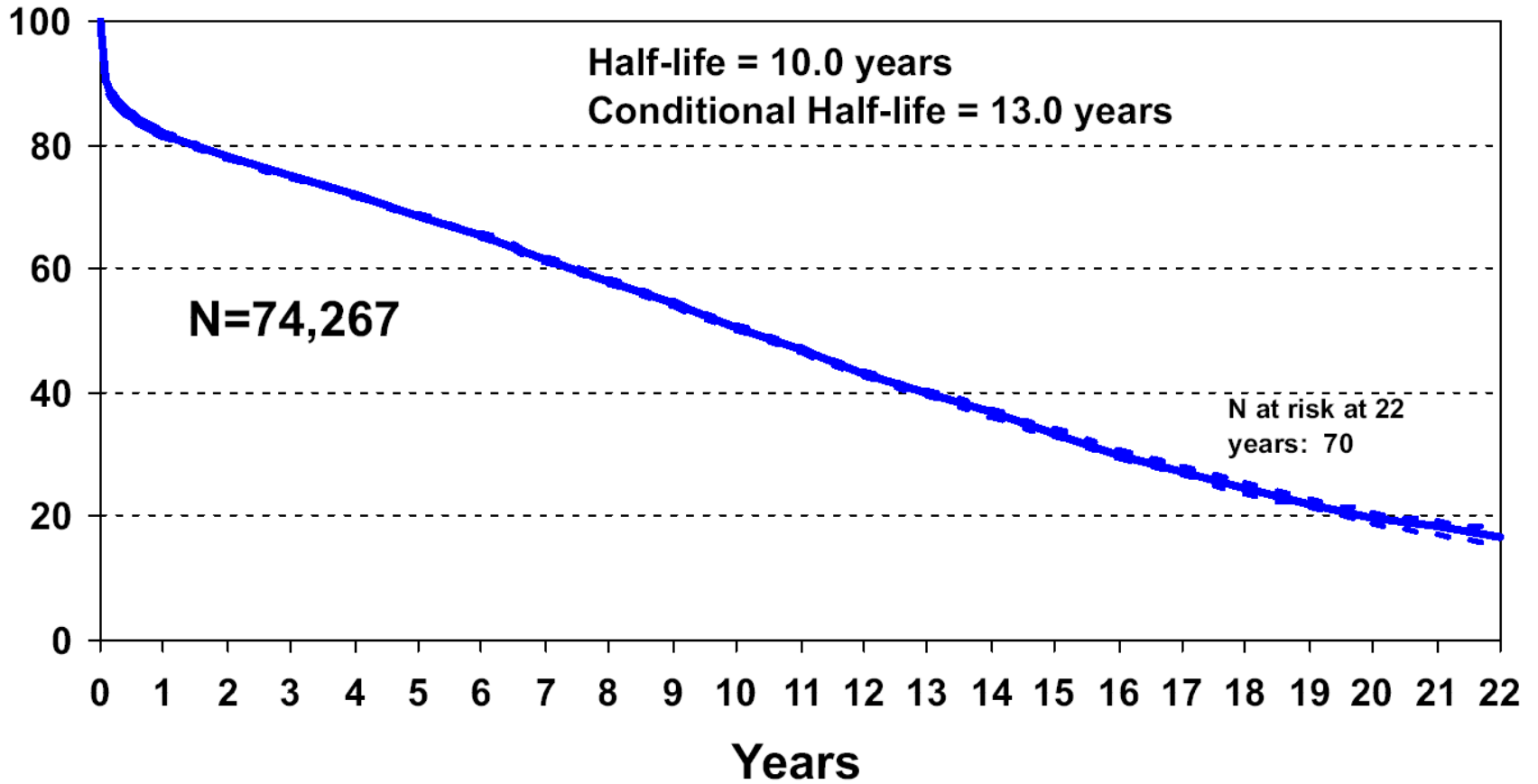
Paso 3 : Infecciones, activas no evidentes, neoplasias ocultas, falla renal.....

ORTHOTOPIC AND HETEROTOPIC CARDIAC TRANSPLANTATION
ANATOMIC CONFIGURATIONS

Orthotopic configuration



CURVA DE SOBREVIVENCIA ACUMULADA ISHLT



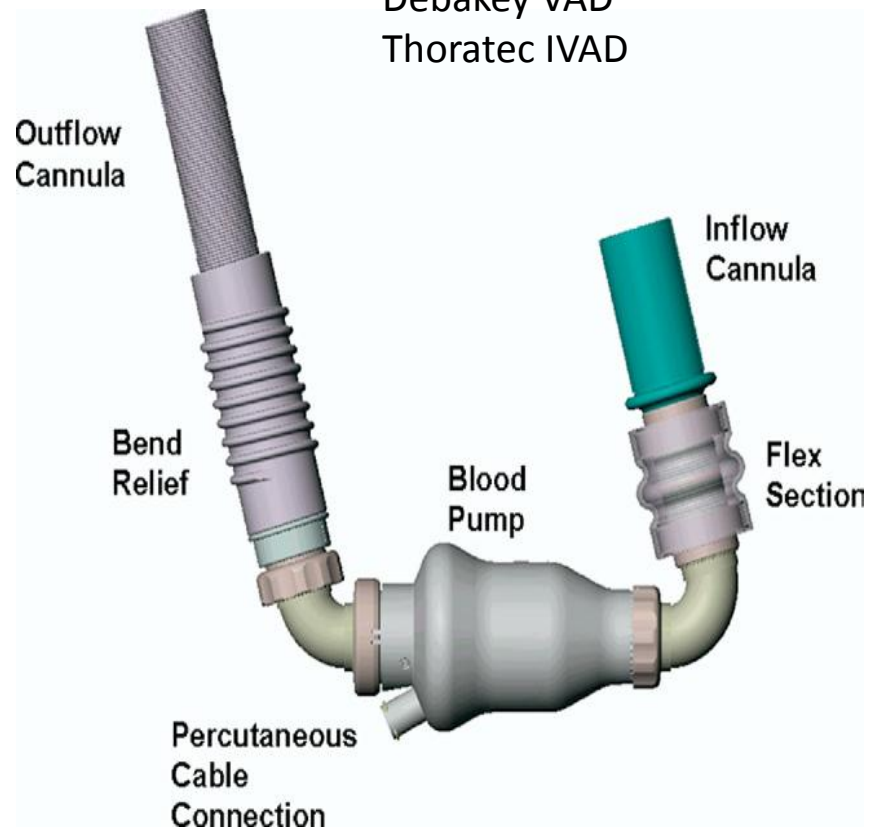


DISPOSITIVOS DE ASISTENCIA VENTRICULAR VADs

TERCERA GENERACION

- . Totalmente implantable
- . Pocas complicaciones
- . Flujo axial sin valvulas
- . Titanio
- . Anticoagulacion.
- . Minimo contacto sanguineo
- . Pequeño tamaño

Heart Mate II
Jarvik 2000
Debakey VAD
Thoratec IVAD



Falla cardiaca

DISPOSITIVOS DE ASISTENCIA VENTRICULAR VADs

PORQUE: ?

1. Cirugía cardiovascular Destete
2. Puente a la Recuperación Retiro
3. PUENTE A TRASPLANTE CARDIACO
4. Cambio por trasplante cardiaco Terapia de Destino – TD

Htp severa no reactiva...

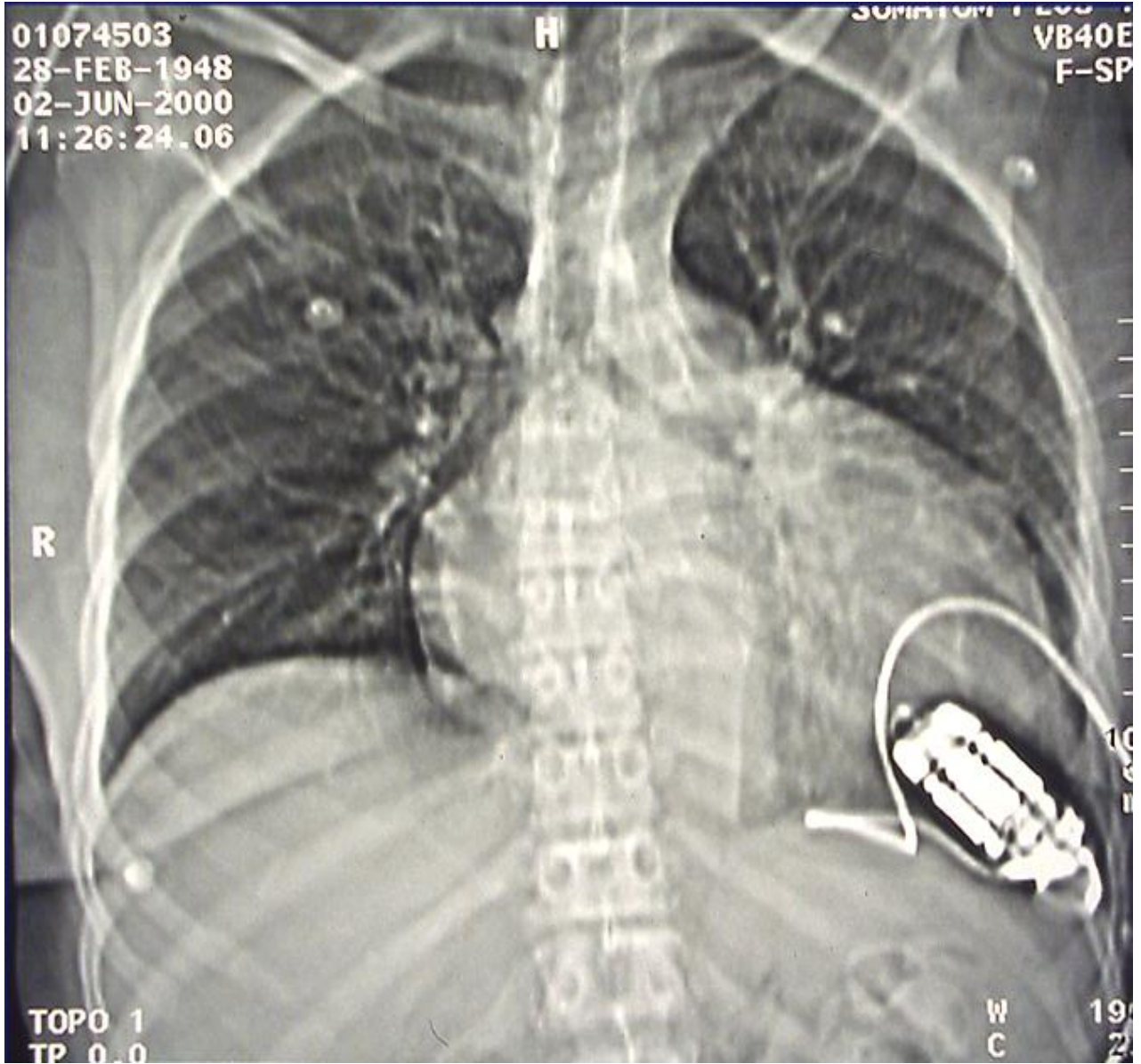
Alta sensibilización....

Otras contraindicaciones relativas...

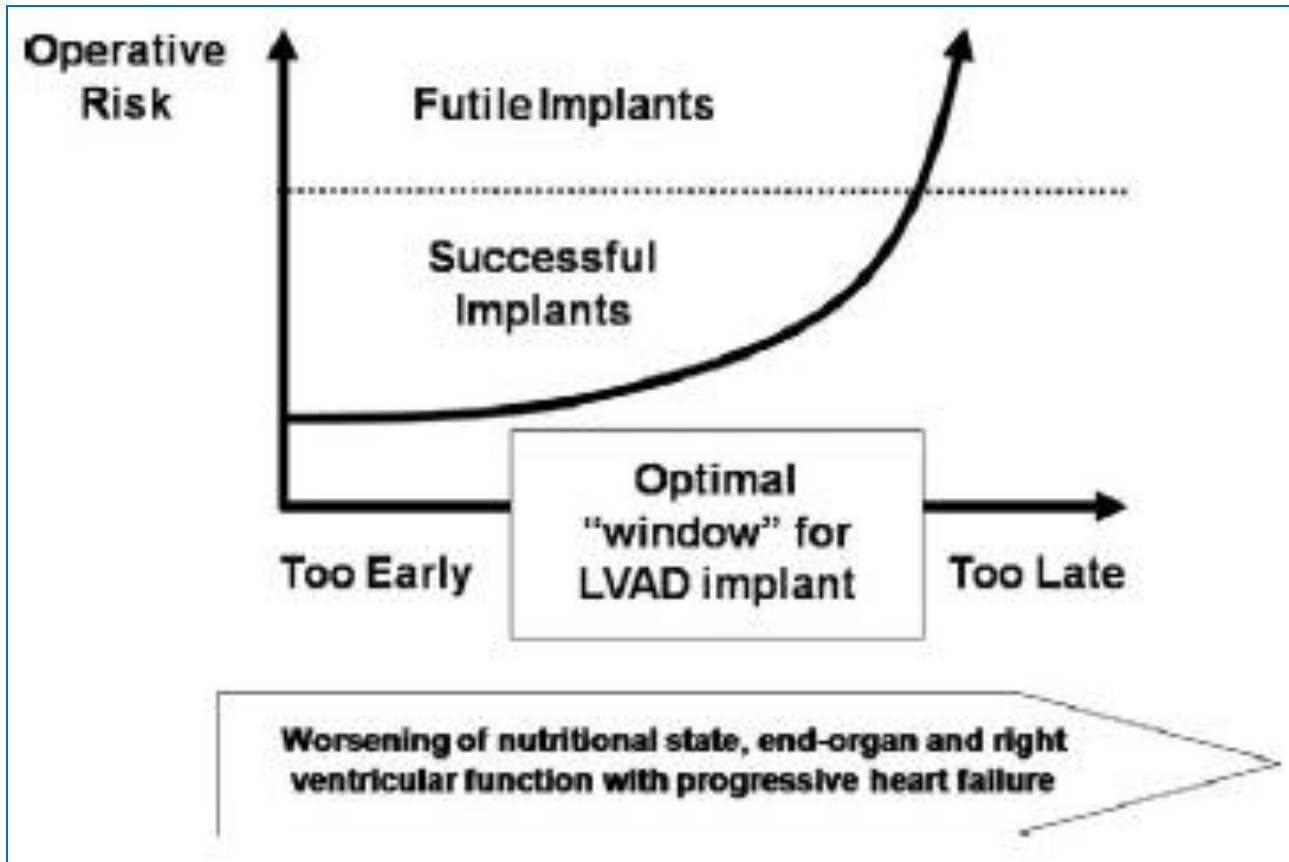
Figure 4 External view of a small magnetically levitated centrifugal flow pump: HeartWare device







TERAPIA DESTINO TD



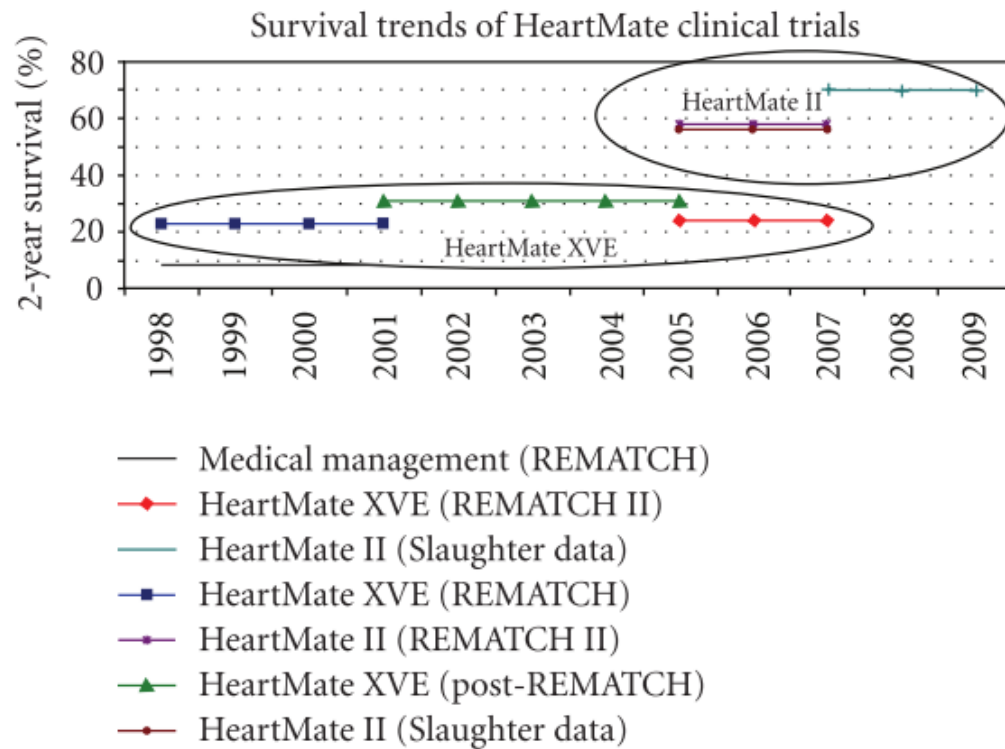


FIGURE 4: Two-year survival trends of HeartMate clinical trials. Sources: ISHLT, Slaughter [4], Rogers [5], Pagani [7], and Rose [11].



Falla cardiaca terminal

- SIN OPCIONES

MANEJO MEDICO OPTIMO INSUFICIENTE CLINICA DE FALLA CARDIACA CF III-IV

CIRUGIA DE FALLA CARDIACA: NO ISQUEMIA/VIABILIDAD. BAJA FEVI

TERAPIA DE RESINCRONIZACION: QRS ANGOSTO

CARDIODESFIBRILADOR IMPLANTABLE AUTOMATICO MENOS DE 1 AÑO DE VIDA

TRASPLANTE DE CORAZON NO APLICA PASO 1, 2, 3.

APARATOS DE SOPORTE VENTRICULAR: NO APLICA

CORAZON ARTIFICIAL TOTAL: NO APLICA

TERAPIA CLS MADRE, TERAPIA GENICA

Falla Cardíaca Terminal

Definición

- Falla cardíaca congestiva recurrente con repetidos ingresos hospitalarios
- Clase funcional IV de NYHA permanente
- Fracción de eyección menor a 20%
- Tratamiento óptimo
- Contraindicación para trasplante de corazón **ni para DSV**

Modificado hospice journal, 1996. 11(2)p 16

The Seattle Heart Failure Model : Prediction of Survival in Heart Failure



Clinical	Medications	Diuretics	Lab Data	Devices
Age: <input type="text" value="65"/>	<input checked="" type="checkbox"/> ACE-I	Furosemide: <input type="text" value="120"/>	Hgb (g/dL): <input type="text" value="13.6"/>	<input checked="" type="radio"/> None <input type="radio"/> BiV Pacer <input type="radio"/> ICD <input type="radio"/> BiV ICD
Gender: <input type="text" value="Male"/>	<input type="checkbox"/> Beta-blocker	Bumetanide: <input type="text" value="0"/>	Lymphocyte %: <input type="text" value="24"/>	
NYHA Class: <input type="text" value="3A"/>	<input type="checkbox"/> ARB	Torsemide: <input type="text" value="0"/>	Uric Acid (mg/dL): <input type="text" value="9"/>	
Weight (kg): <input type="text" value="80"/>	<input type="checkbox"/> Statin	Metolazone: <input type="text" value="0"/>	Total Chol (mg/dL): <input type="text" value="190"/>	
EF: <input type="text" value="20"/>	<input type="checkbox"/> Allopurinol	HCTZ: <input type="text" value="0"/>	Sodium: <input type="text" value="137"/>	
Syst BP: <input type="text" value="120"/>	<input type="checkbox"/> Aldosterone blocker		<input type="checkbox"/> QRS > 120 msec	
<input checked="" type="checkbox"/> Ischemic				<input type="button" value="Default Values"/>

Interventions

ACE-I ARB Beta-blocker
 Statin Aldosterone blocker

Devices

None
 BiV Pacer BiV ICD
 ICD LVAD

Note: Some devices may be disabled if CMS clinical criteria are not met

Excellent

Functional Status

SUPPORTIVE CARE

2

3

1

HEART FAILURE CARE

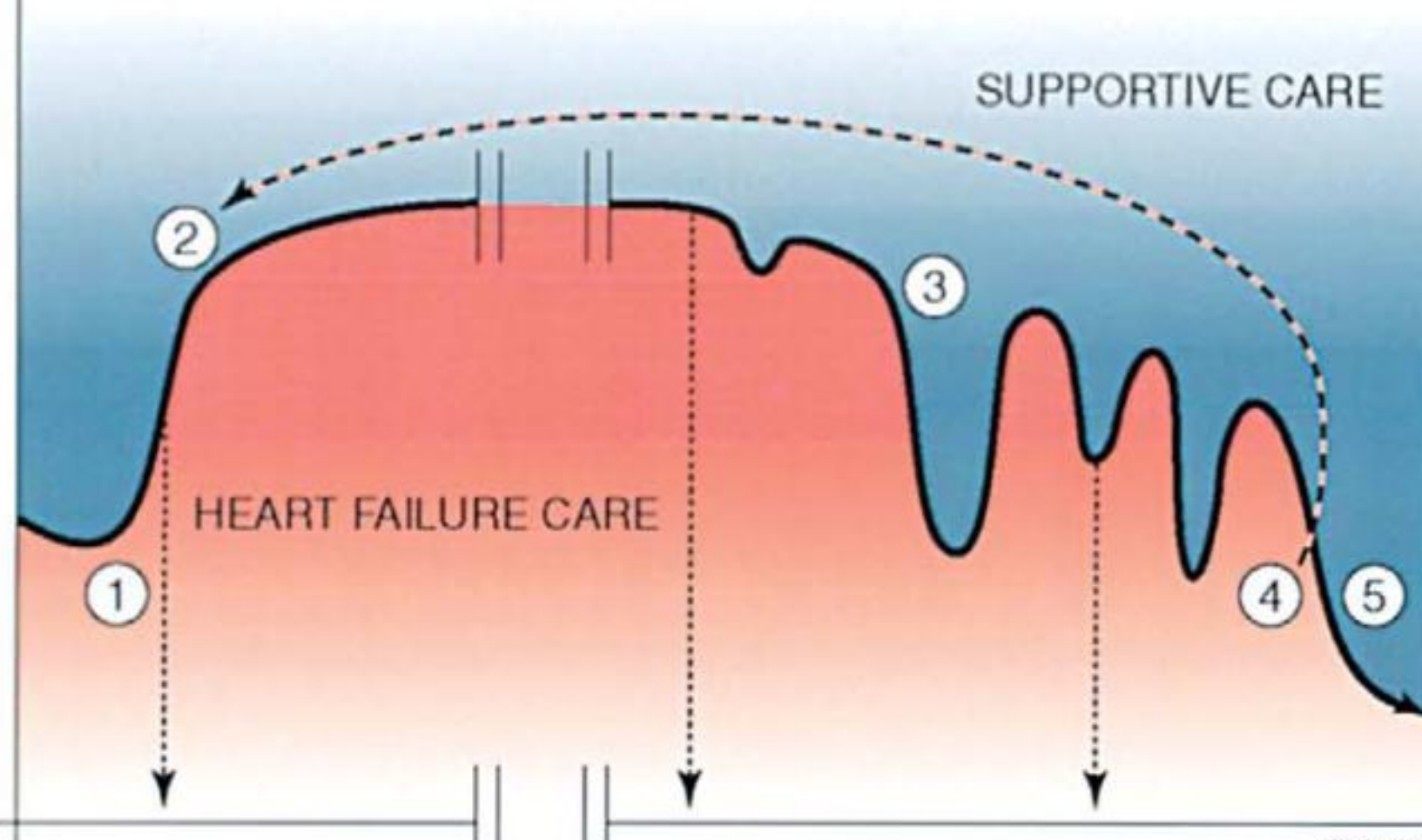
4

5

Death

Time

© 2003



GRACIAS iii



Falla cardiaca terminal

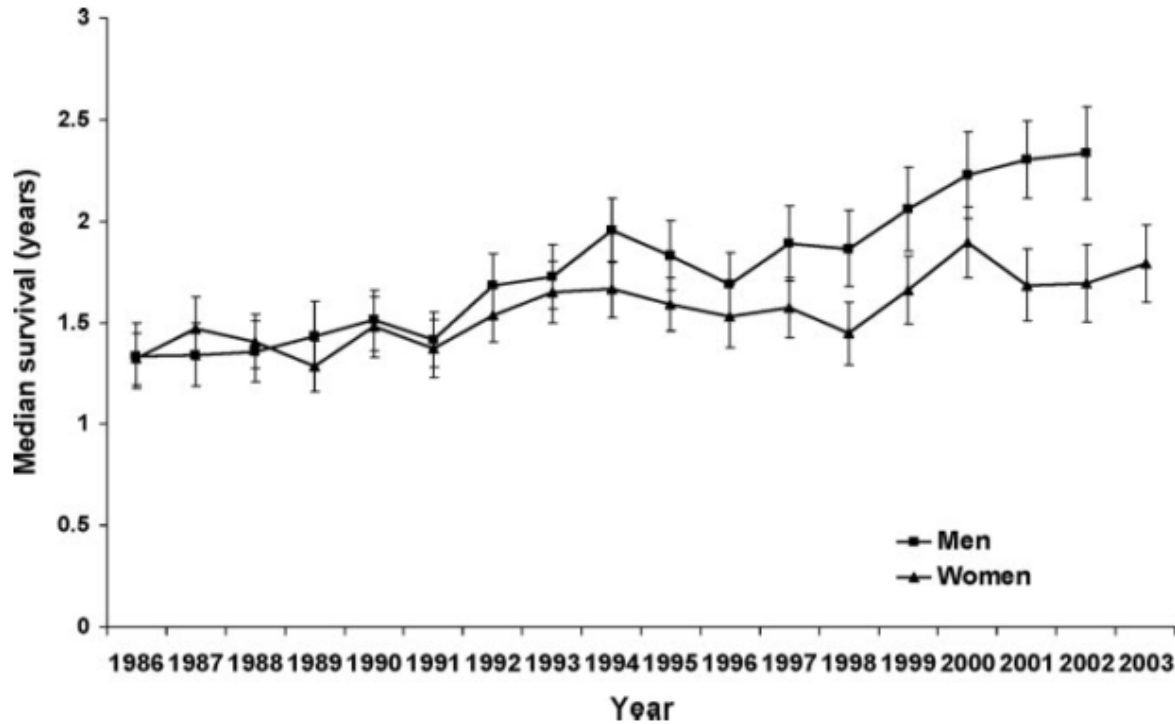


Figure 2. Trends in median survival (excluding deaths within 30 days) according to sex and year of admission. Error bars represent 95% CIs.

(Circulation. 2009;119:515-523.)

Falla cardiaca terminal

PREGUNTA - RESPUESTA – PREGUNTA - RESPUESTA

- Fin de vida
- El paciente
- La familia
- Ética
- Psicología
- Acuerdo del fin de la vida
- Uso de medicamentos de falla cardiaca, dolor: opiáceos
- Desactivación del CDI

Falla cardiaca terminal

INOTROPICOS INH DE FOSFODIESTERASA Y DOBUTAMINA:

- NO USAR DE RUTINA
- SI EVENTO AGUDO
- PALIACION EN FALLA CARDIACA REFRACTARIA
- EN PACIENTE EN LISTA DE TRASPLANTE CON CDI

AGENTES SENSIBILIZADORES DEL CALCIO: LEVOSIMENDAN

