

Chronic Heart Failure Revisited

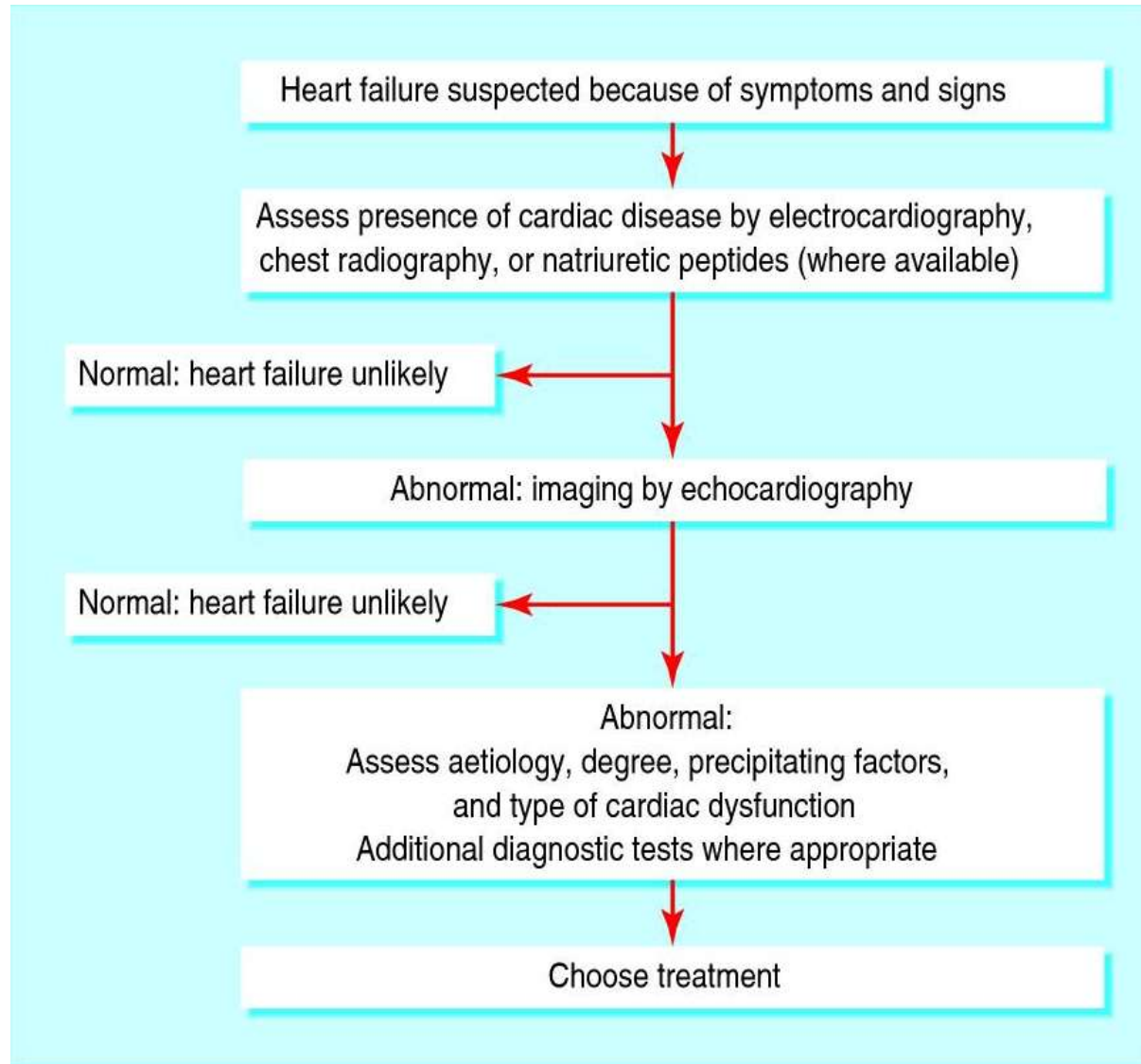
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What You Should Already Know

Recent developments

- Transthoracic echocardiography is the key investigation to confirm the underlying structural and functional abnormalities of the heart
- Patients with heart failure due to left ventricular systolic dysfunction should be treated with a diuretic, an angiotensin converting enzyme inhibitor, and a β blocker (unless contraindicated)
- Patients with more severe symptoms should also be prescribed spironolactone
- Monitoring of the control of the heart failure syndrome and blood biochemistry is essential to reduce the risk of complications and decompensation
- High quality and timely communication between patients and all the healthcare professionals involved in their care is essential

ESC Guidelines



Diastolic Heart Failure

Commonest Type of CHF in Primary Care

- Stiffening of the ventricle
 - Poor filling, need for higher than normal filling pressures
 - Small fluid shifts often poorly tolerated
 - Difficult balance between pulmonary congestion and systemic hypotension
- Often accompanies systolic heart failure
- Isolated diastolic failure:

Common causes Uncommon causes

Hypertension

Hypertrophic cardiomyopathy

Ischaemia

Infiltration

Simple Definition of DHF = Raised BNP with normal EF

Basic Investigations

- Twelve lead electrocardiography
- Chest radiography
- Blood biochemistry (including urea, creatinine, glucose, electrolytes), haemoglobin, thyroid and liver function tests, and blood lipids
- Urinalysis to detect proteinuria or glycosuria
- Cardiac imaging—usually a transthoracic echocardiogram, which can rapidly provide detailed information about the structure and function of the cardiac chambers, valves, and pericardium.

BNP

Diagnosis

'Rule out Tests' in Patients With Dyspnoea or Effort Intolerance

- If ECG completely normal then systolic CHF unlikely
- If Natriuretic peptides normal then CHF due to any cause unlikely.

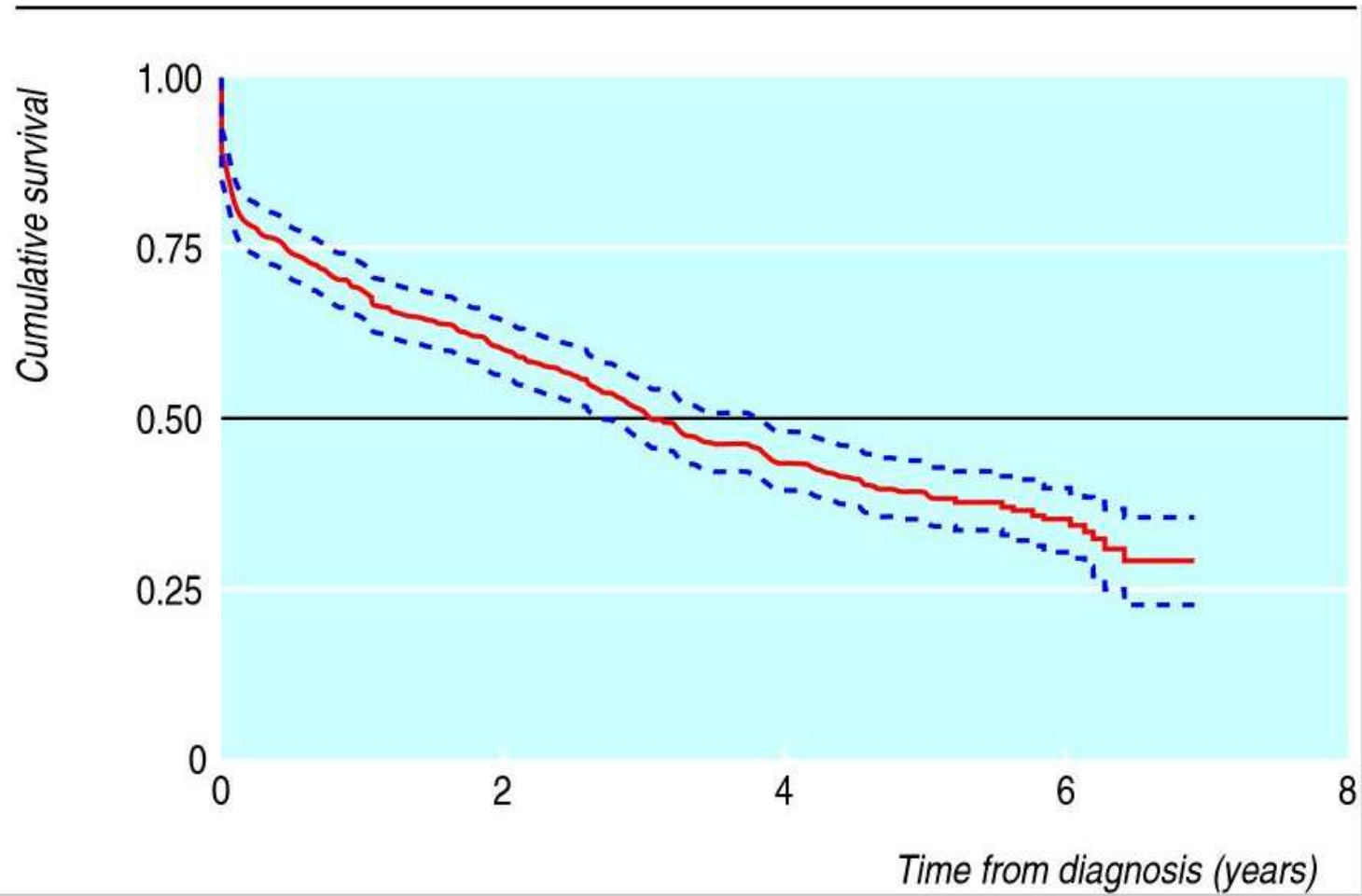
Drug Dosage

Recommended starting and maintenance dose ranges for selected angiotensin converting enzyme inhibitors and β blockers used in clinical trials for the treatment of heart failure

Drug	Starting dose	Maintenance dose
Angiotensin converting enzyme inhibitors		
Captopril	6.25 mg three times daily	25-50 mg three times daily
Enalapril	2.5 mg once daily	10 mg twice daily
Lisinopril	2.5 mg once daily	5-20 mg once daily
Perindopril	2 mg once daily	4 mg once daily
Ramipril	1.25-2.5 mg once daily	2.5-5 mg twice daily
Trandolapril	1 mg once daily	4 mg once daily
β blockers		
Bisoprolol	1.25 mg once daily	10 mg once daily
Carvedilol	3.125 mg twice daily	25 mg twice daily
Metoprolol tartrate	5 mg three times daily	50 mg three times daily
Metoprolol succinate CR	12.5-25 mg once daily	200 mg once daily

BMJ. 2002 August 24; 325(7361): 422-425.

Survival of 552 cases of CHF in London CHF Studies



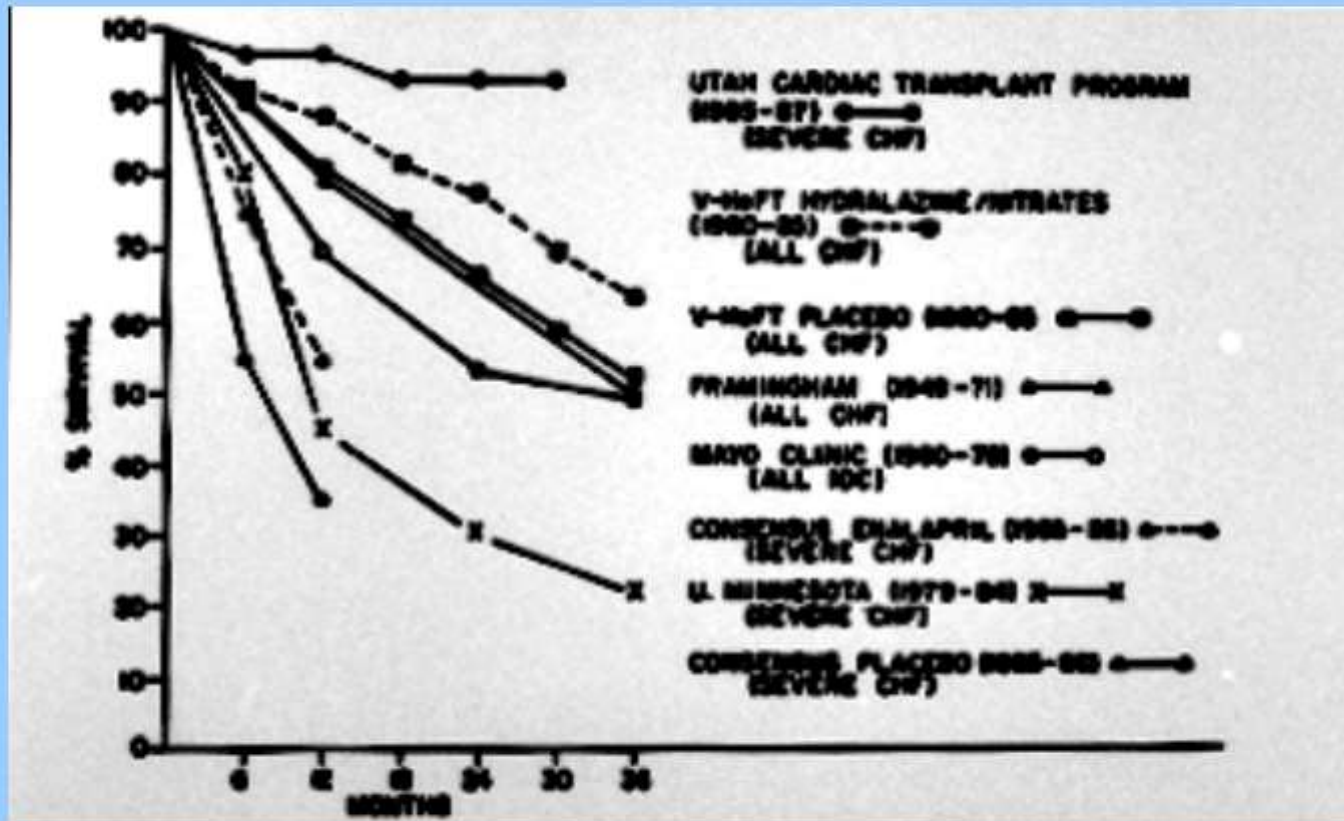
Monitoring CHF

- Clinical – Symptoms, Signs and JVP
- Weight
- 6 minute Walk
- Serial BNP Treatment of heart failure guided by plasma aminoterminal brain natriuretic peptide (N-BNP) concentrations. Troughton RW, Frampton CM, Yandle TG, Espiner EA, Nicholls MG, Richards AM.
- Serial Echos
- Right Heart Caths

Number of days alive outside the hospital: NT-proBNP-guided patients vs clinically guided patients

PRIMA end points	NT-proBNP- guided group	Clinically guided group	p
Number of days alive outside the hospital	685	664	0.49
Total mortality	46/174 (26.5%)	57/171 (33.3%)	0.196

Effect of Cardiac Transplantation on Survival In CHF



Device Therapy

- ◆ Pacemakers for Bradycardia
- ◆ ICD
- ◆ CRT
- ◆ CRT-D
- ◆ LVAD

A man in a grey sweater and dark trousers sits on a white sofa, looking towards the right. Next to him sits a Grim Reaper figure in a black hooded robe, holding a wooden staff. The figure's head is a wooden cuckoo clock with a white face and black hands. In the background, a small table holds a yellow water bottle and a glass, and a black bag sits on the floor. The scene is set in a modern, minimalist interior with a light-colored tiled floor and a dark wall.

*50 % of Heart Failure Patients are
SAD*

MADIT

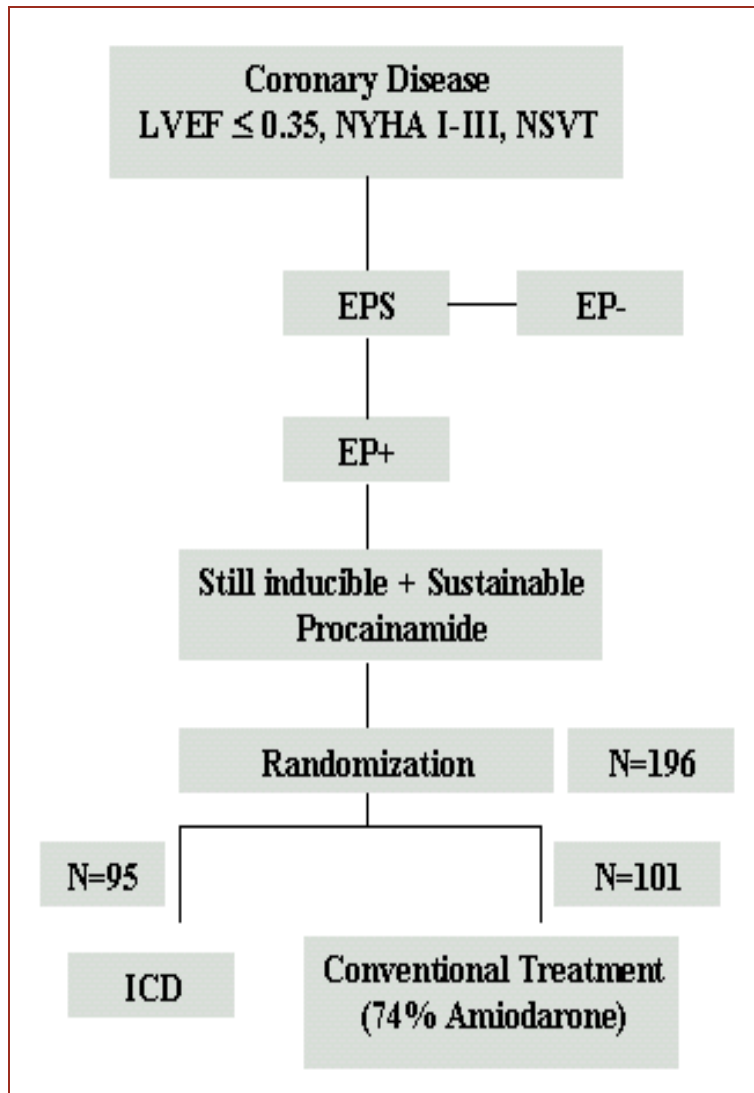
Multicenter Automatic Defibrillator Implantation Trial

Status: Completed in 1996

Patient Population²

- Heart attack survivors:
 - Prior MI
 - EF \leq 35%
 - asymptomatic NSVT
 - NYHA Class I-III
- 196 patients from 32 US centers
 - 95 received defibrillator
 - 101 received medical therapy

Study Design



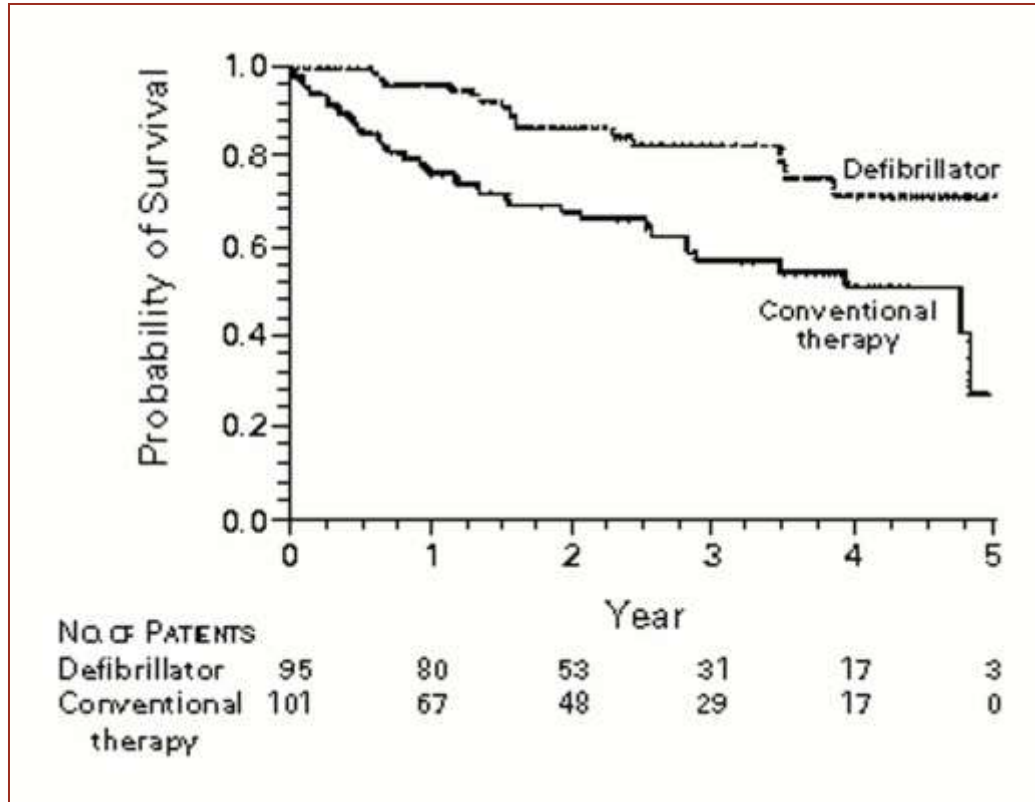
Two patient groups (1:1)

1. Conventional Medical Therapy (CMT)
2. CMT + ICD

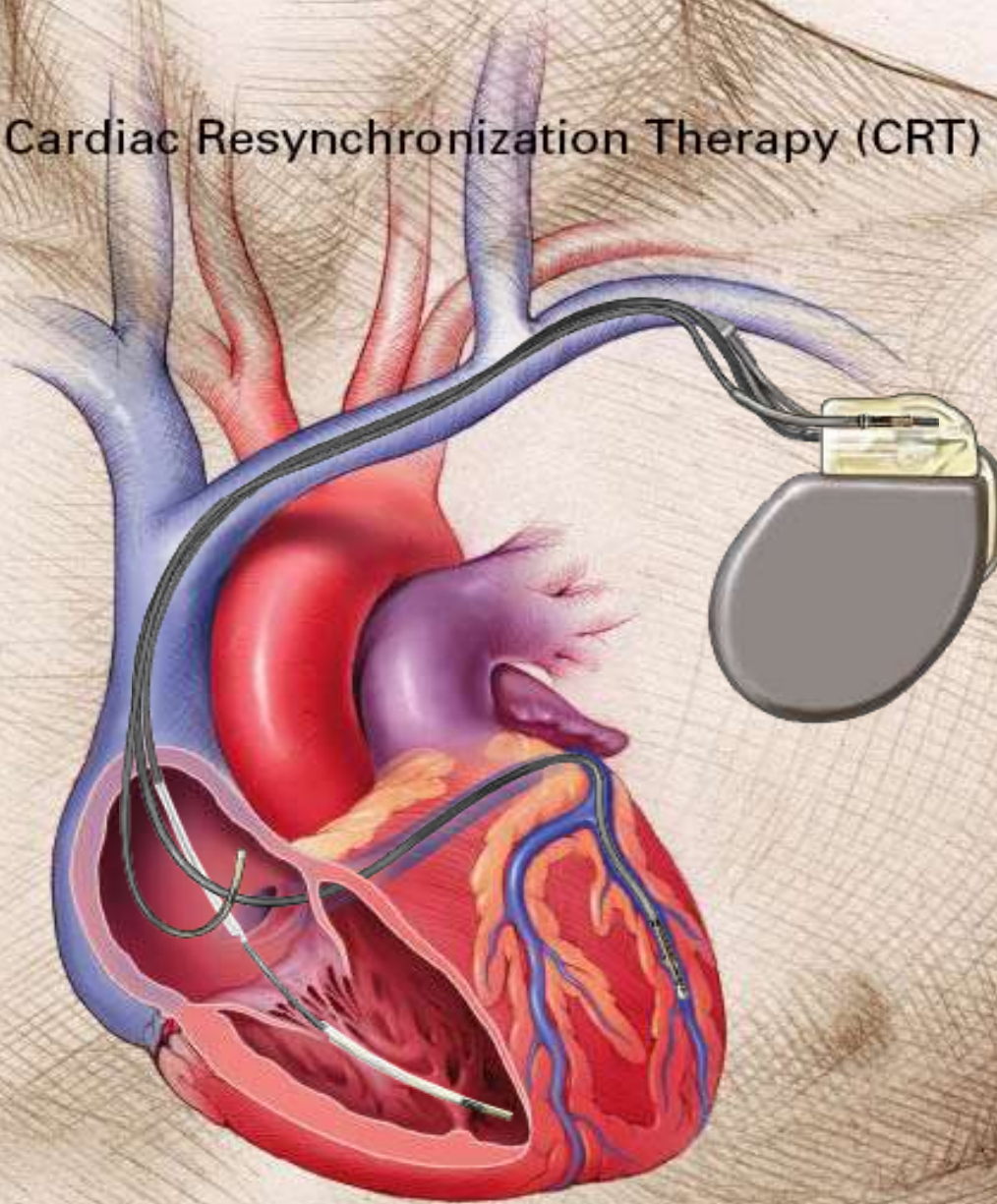
Primary endpoint: Mortality

Results

- Use of ICDs resulted in a 54% reduction in the risk of all-cause mortality rate in the defibrillator group as compared to the CMT group. (p value: 0.009)
- There was no evidence that amiodarone, beta-blockers, or any other antiarrhythmic therapy had a significant influence on the mortality curves.



Cardiac Resynchronization Therapy (CRT) Device Implantation



COMPANION

Comparison of Medical Therapy, Pacing and
Defibrillation in Heart Failure

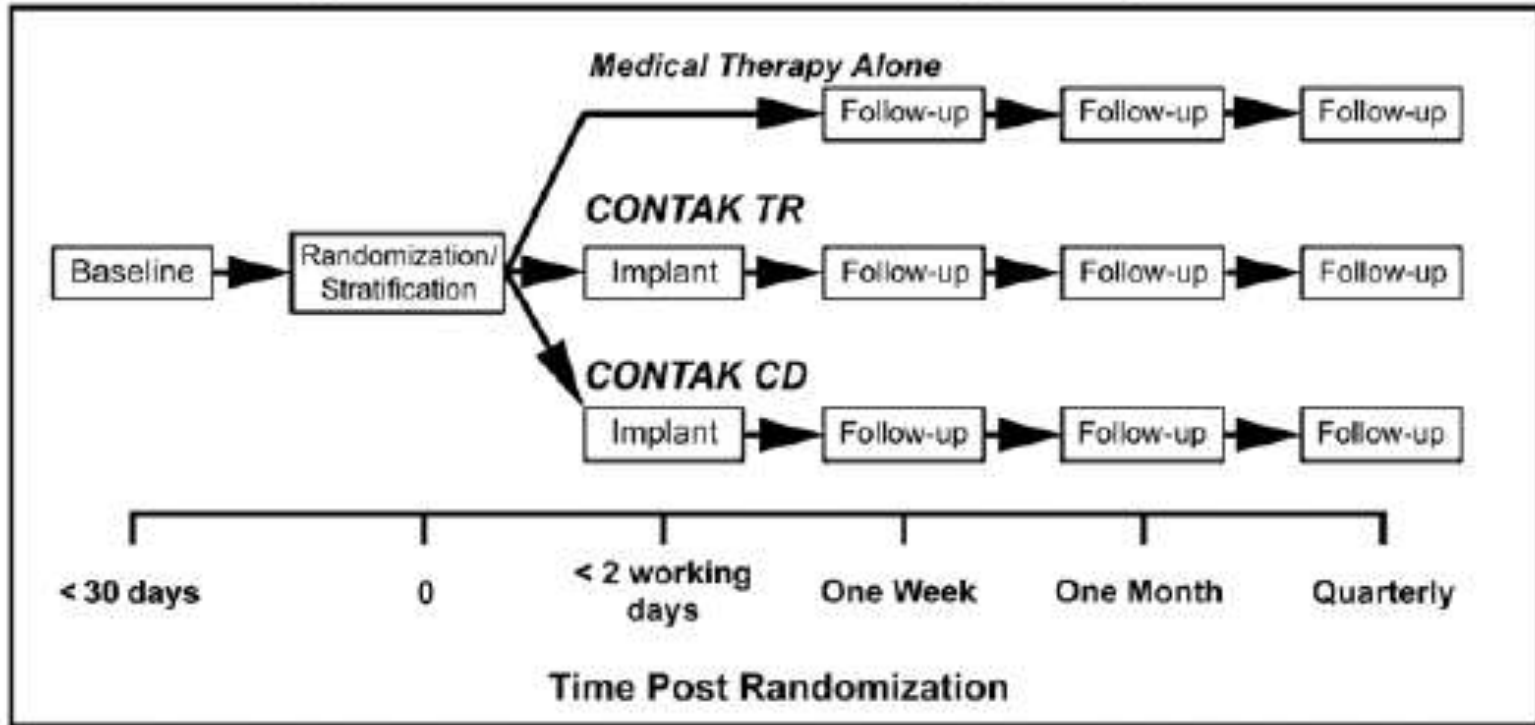
COMPANION

Comparison of Medical Therapy, Pacing and Defibrillation in
Heart Failure

Status: Completed in 2002

The first trial to show that CRT, used in combination with
OPT, can significantly improve both the quality and duration
of life for a large group of heart failure patients

Study Design



Randomization (1:2:2)

20% received OPT alone

40% received OPT + CRT-P

40% received OPT + CRT-D

Patient Population

- 1520 Heart Failure patients
 - NYHA class III/IV
 - $EF \leq 35\%$
 - $QRS \geq 120$ ms
 - PR interval > 150 ms
- 128 U.S. centers

Clinical Relevance

- The primary endpoint Combination of all-cause mortality or first hospitalization as measured by time to first event
- Proved for the first time that CRT-D therapy, used in combination with optimal pharmacologic therapy (OPT), can significantly improve both the quality and duration of life for patients with late-stage symptomatic heart failure versus using OPT alone.
- As a result of COMPANION, the benefits of CRT-D therapy are available to heart failure patients who otherwise do not have an ICD indication.

MADIT-CRT

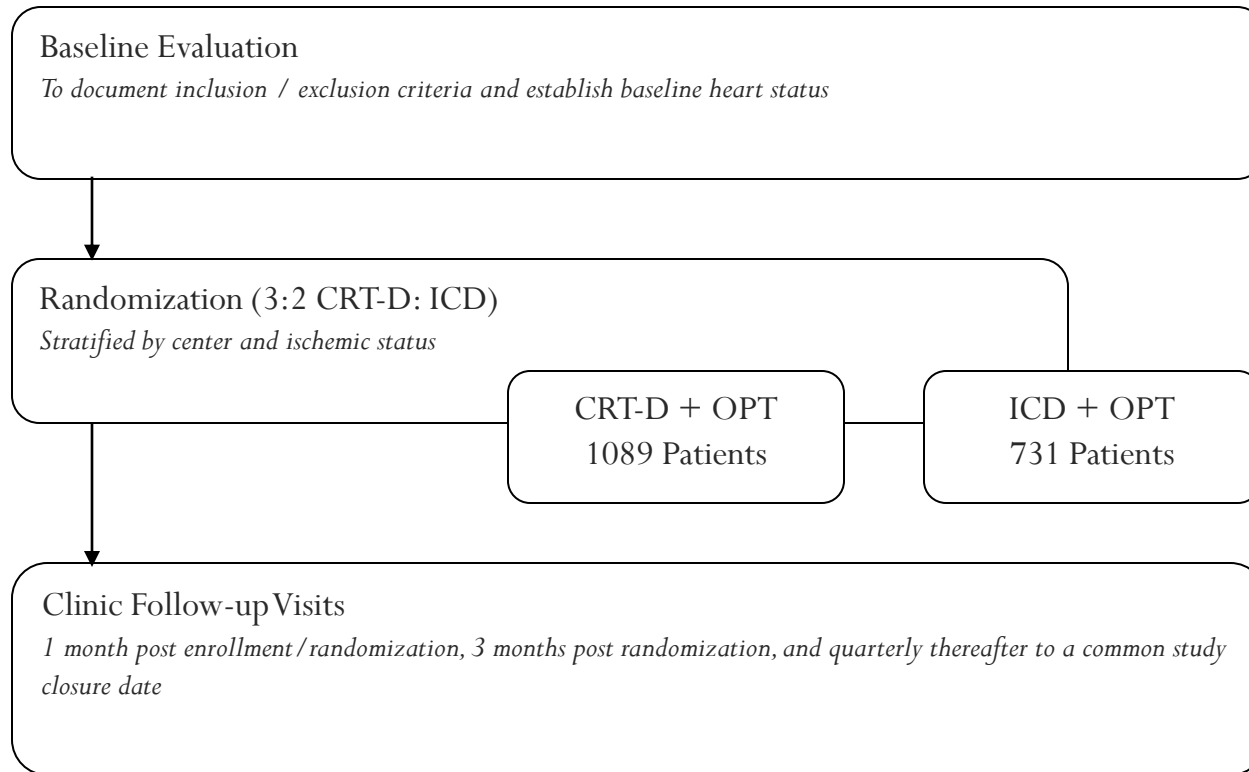
Multicenter Automatic Defibrillator Implantation Trial - Cardiac
Resynchronization Therapy

STATUS: Study Met Its Primary Endpoint June 2009

MADIT-CRT

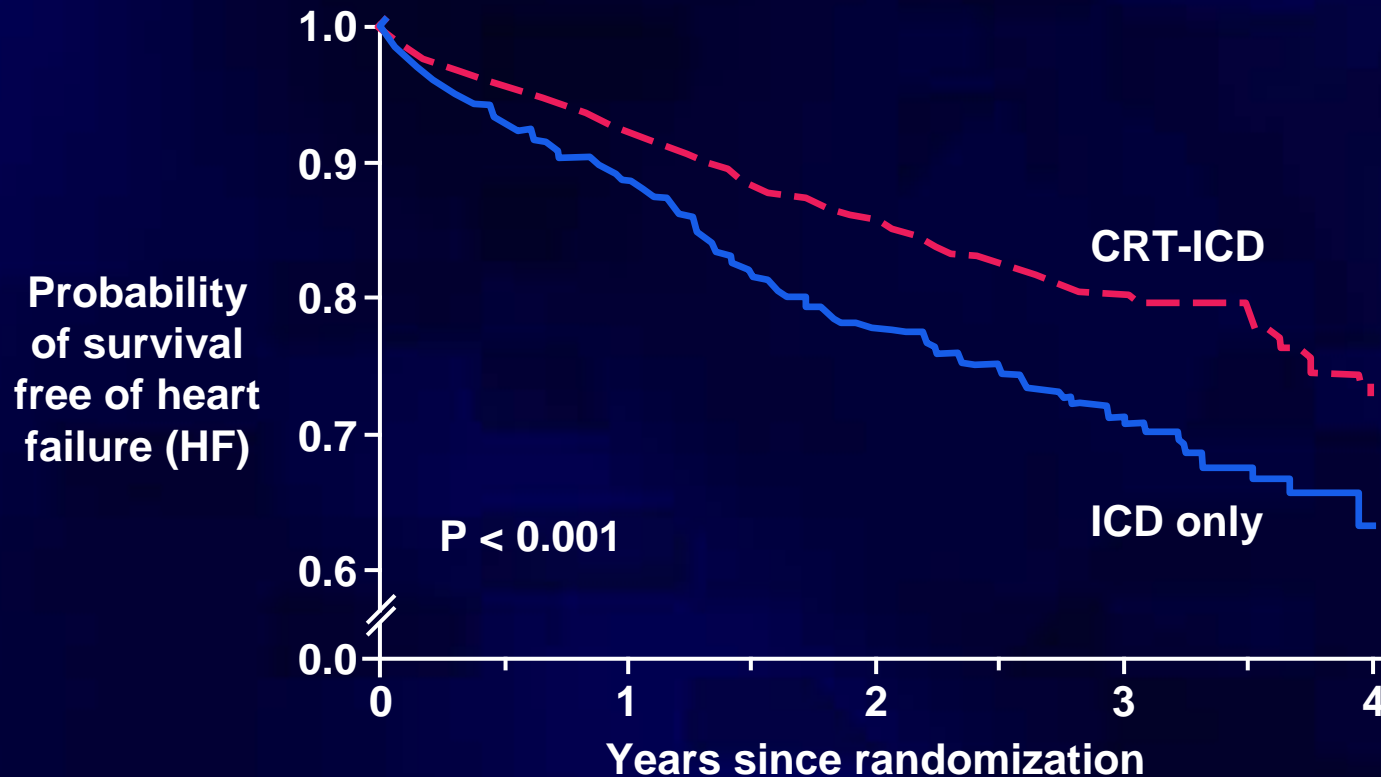
MADIT-CRT is the world's largest randomized NYHA Class I/II CRT-D trial and was designed to show whether early intervention with CRT can slow the progression of heart failure.

Design



MADIT-CRT: Survival free of HF according to treatment strategy

N = 1820 with ischemic or nonischemic cardiomyopathy, EF \leq 30%, QRS \geq 130 msec, & NYHA Class I/II symptoms



Results

- CRT-D therapy reduced the relative risk of all-cause mortality or first heart failure event by 34% when compared to ICD-only therapy ($p = 0.001$).
 - The CRT-D results were driven by a 41% relative reduction in HF events ($p < 0.001$)
 - At 12 months, CRT-D patients experienced a significant 11% improvement in LVEF compared to a 3% improvement in ICD patients ($p < 0.001$)
 - Baseline characteristics were similar between both treatment arms.

Role of Aspirin in CHF unclear

Take Home

- One of the “Big 3” CVS Epidemics
- Increasing Prevalence
- High Mortality and Morbidity- “ Cancer of the Heart”
- Diagnosis based on Clinical, Imaging and BNP measurements
- Drug Therapy *plus* Nursing, Primary &Secondary Integrated Care Team Approach
- SAD responsible for half the mortality
- Cardiac Transplantation in selected cases
- Increasing role for device therapy
- \$\$\$\$\$\$\$\$\$\$

Treatment
of
CHF

Winnert

