CRT-P or CRT-D ?
The CeRtiTuDe Cohort Study

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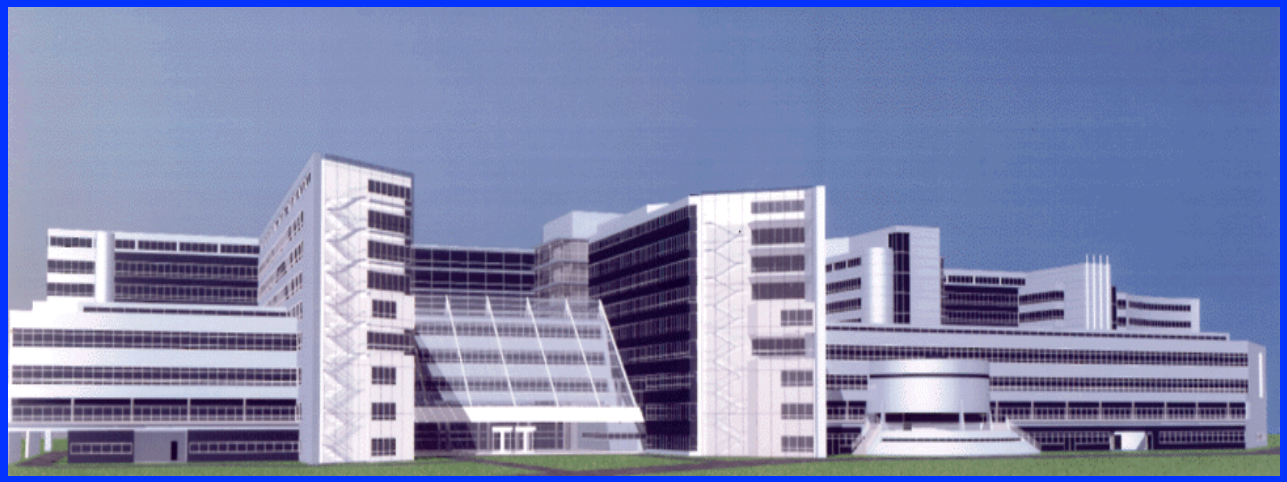
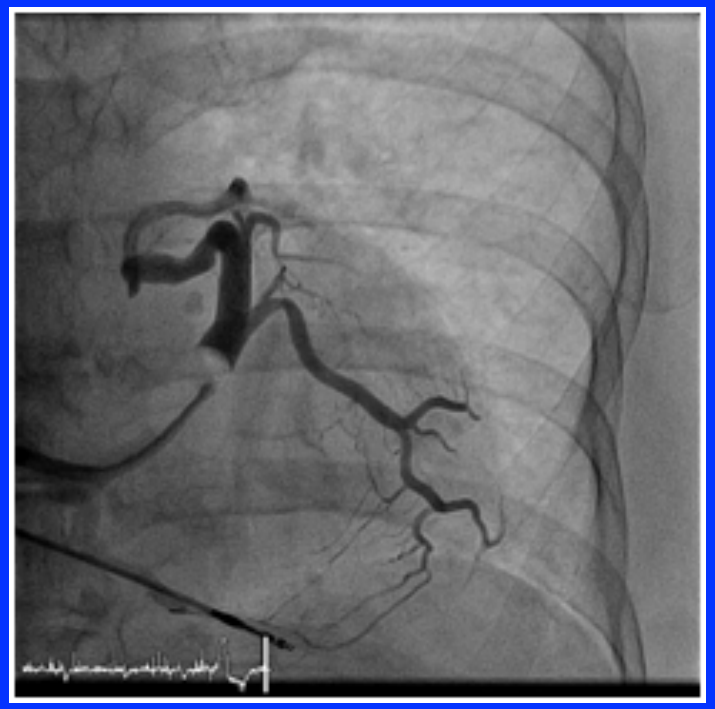


London, September 1st, 2015

CRT — EVIDENCE



- **Functional Outcome**
  - Cazeau et al. N Engl J Med 2001
- **Vital Outcome**
  - Cleland et al. N Engl J Med 2005
- **Updated Guidelines**
  - AHA / HRS 2012
  - ESC / EHRA 2013

CRT-P OR CRT-D ?

- **Survival benefit** of CRT-D over CRT-P is still a matter of debate
- **Rationale**
  - Device-Related Morbidity
  - Economics / cost
  - Competing risks for mortality
- **Guidelines** leave flexibility for physician

CRT-P OR CRT-D ?

ESC GUIDELINES (Eur. Heart J. 2013; 34: 2281–329)

- The **evidence** from RCTs is **insufficient to show the superiority of** combined CRT and **ICD** over CRT alone.
- Owing to the potential incremental **survival benefit** of CRT-D over CRT-P, the prevailing opinion among the members of this Task Force is in favour of a **superiority of CRT-D** in terms of total mortality and sudden death.
- Nevertheless trial evidence is usually required before a new treatment is used routinely. In the **absence of proven superiority** by trials and the small survival benefit, this Task Force is of the opinion that **no strict recommendations can be made**, and prefers to merely offer guidance regarding the **selection of patients** for CRT-D or CRT-P, based on overall clinical condition, device-related complications and cost.

OBJECTIVES

- **To evaluate the extent to which:**
  - **CRT-P patients differ from CRT-D patients in real life settings**
  - **CRT-P patients could have additionally benefited from a back-up defibrillator**

METHODS (I)

- **Funded and Coordinated by the French Society of Cardiology**
  - Prospective Multicentric Cohort Study
  - 41 participating centers
  - 1705 patients: 535 CRT-P and 1170 CRT-D
- **Enrollment** from Jan. 2008 to Dec. 2010
- **Follow-up** at 6, 12, 18, and 24 months
  - Clinical / Echo / Device check up
  - Completed in 1611 (94.5%)

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METHODS (II)

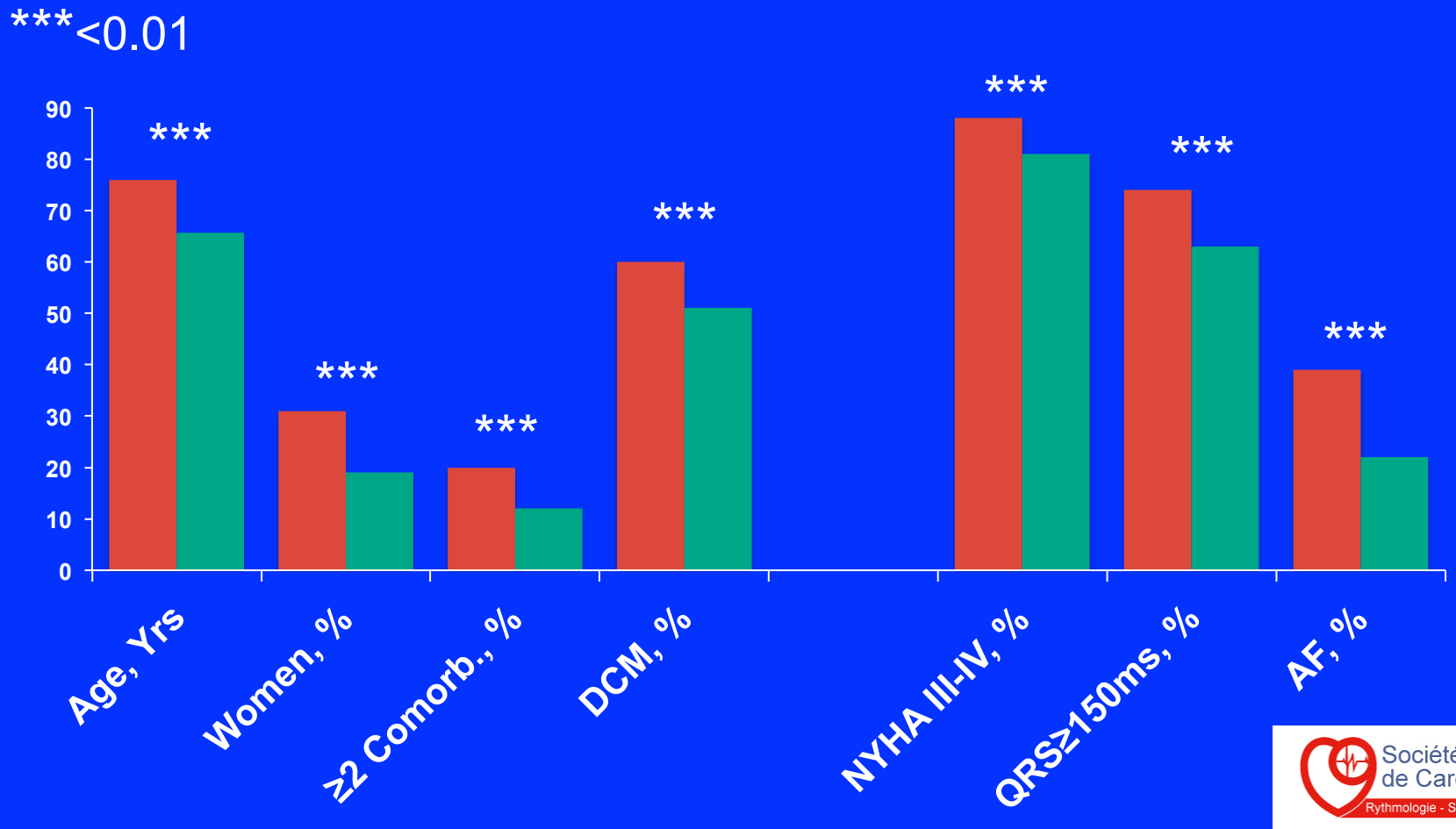
- **Adjudication of Causes of Death**
  - Central adjudication by two reviewers
  - Systematic review of all death notifications
  - Pre-Established classification
- **Logistic / Cox / proportional sub-distribution hazard model**

RESULTS — CeRtiTuDe Cohort

	CeRtiTuDe
Number of patients	1705
CRT-P / CRT-D (%)	31 / 69
Mean age, yrs	69
>75 yrs (%)	34
Women (%)	23
Ischemic heart disease (%)	47
NYHA class III (%)	76
LV ejection fraction (%)	26
QRS (ms)	158
Atrial fibrillation (%)	27

RESULTS
CHARACTERISTICS AT IMPLANT

CRT-P *vs.* CRT-D



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RESULTS
CHARACTERISTICS AT IMPLANT

CRT-P *vs.* CRT-D

***<0.01

	OR	95% CI	p
Age	1.17	1.14 – 1.19	< 0.0001
Women	1.78	1.24 – 2.55	0.0018
DCM	1.75	1.28 - 2.40	0.0005
LVEF < 25%	1.05	1.02 – 1.07	0.0001
NYHA IV	2.40	1.76 – 3.26	< 0.0001

Age, … Women, ≥2 Comorb.; DCM, … NYHA III-IV; QRS≥150ms; AF;

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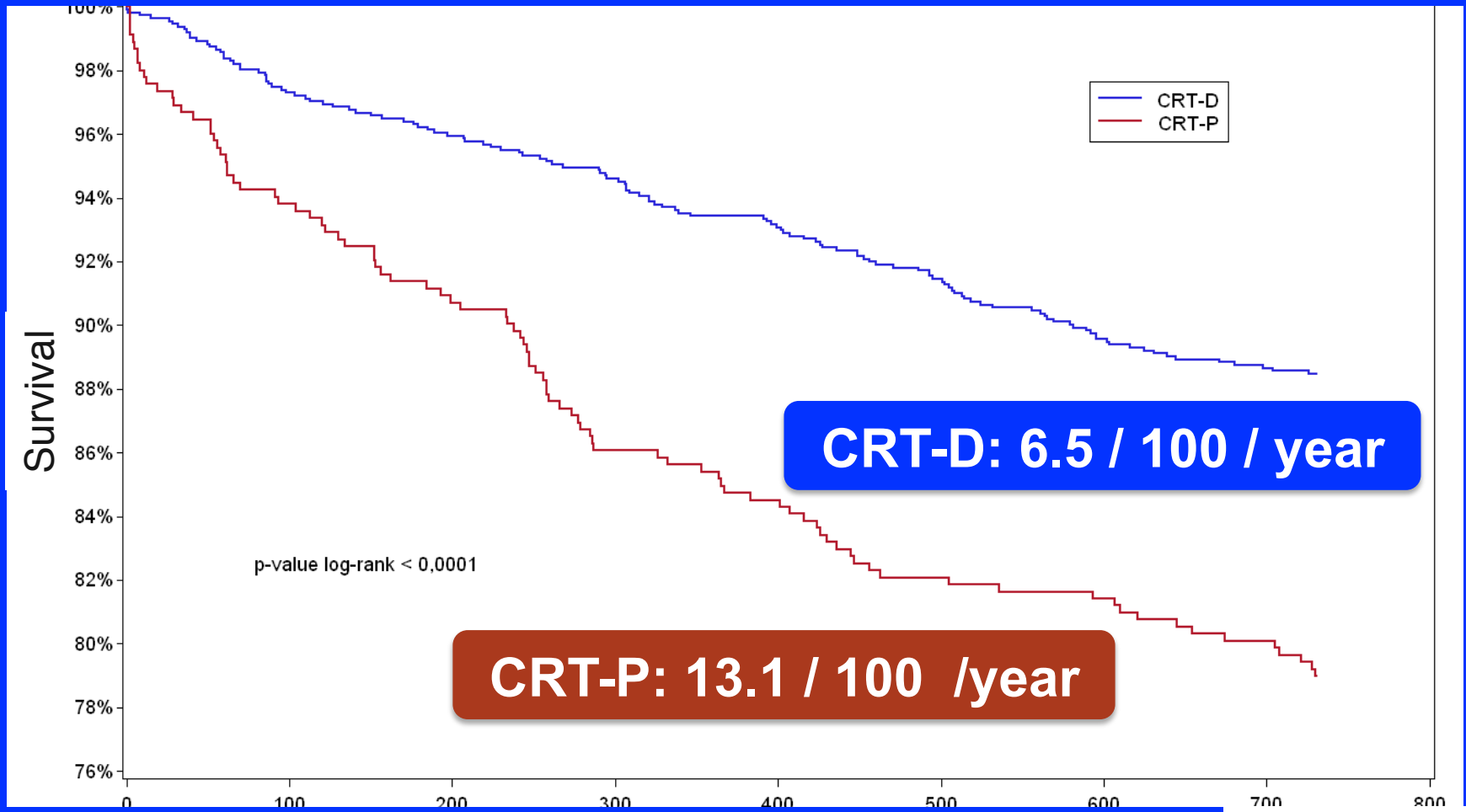
RESULTS — Overall Mortality

Among the 1611 patients with complete follow-up, 267 deaths



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RESULTS — Incidence of Specific Causes of Death among CRT-P and CRT-D recipients

Incidences per 1000 pt / year

Mortalities	CRT-P (N=535)	CRT-D (N=1170)	
Total	130.8 (106.5–155.1)	65.1 (54.3–75.9)	p < 0.0001
Cardiovascular			
Heart Failure	75.4 (56.9–93.9)	33.3 (25.5–41.0)	p < 0.0001
Sudden Death	11.8 (4.5–19.1)	7.5 (3.8–11.2)	0.26
Others	8.3 (2.2–14.4)	1.9 (0.1–3.7)	P = 0.01
Non-Cardiovascular			
Device-Related	1.2 (0–3.5)	2.8 (0.6–5.1)	0.41
Others	28.4 (16.4–40.4)	16.8 (11.3–22.3)	0.01

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Excess Mortality in CRT-P = Non Sudden Death in > 95%

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Factors favouring CRT-P	Factors favouring CRT-D
Advanced heart failure	Life expectancy >1 year
Severe renal insufficiency or dialysis	Stable heart failure, NYHA II
Other major co-morbidities	Ischaemic heart disease (low and intermediate MADIT risk score)
Frailty	Lack of comorbidities
Cachexia	

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CONCLUSIONS

1- CRT-P recipients dramatically differ from CRT-D recipients

2- Patients with CRT-P compared to CRT-D were older, less often male, more symptomatic, with less coronary artery disease, wider QRS, more atrial fibrillation and comorbidities

3- Mortality rate of CRT-P patients was double but these patients, as currently selected in daily clinical practice, would not have potentially benefited from CRT-D implantation

4- There is still room available for CRT-P and RCTs comparing CRT-D and CRT-P remain needed for some specific categories of patients

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