Psychosocial issues and Type D personality: Effects on rehabilitation

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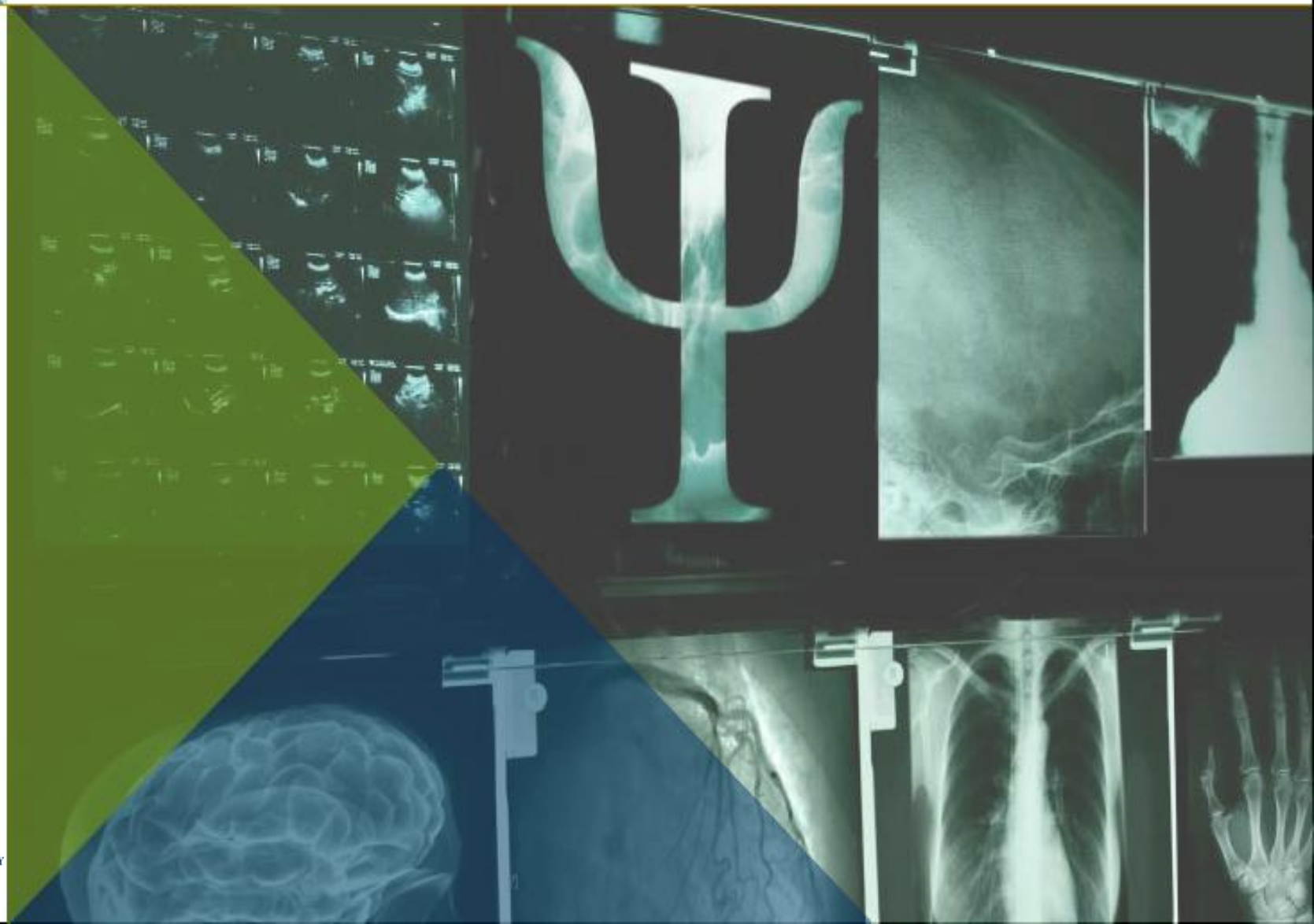
CoRPS

Center of Research on Psychology in Somatic diseases



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Overview

- The nature of Type D personality
- Impact of Type D across heart diseases
- Type D and cardiac rehabilitation
- Mechanisms
- Conclusions

Overview

- **The nature of Type D personality**
- Impact of Type D across heart diseases
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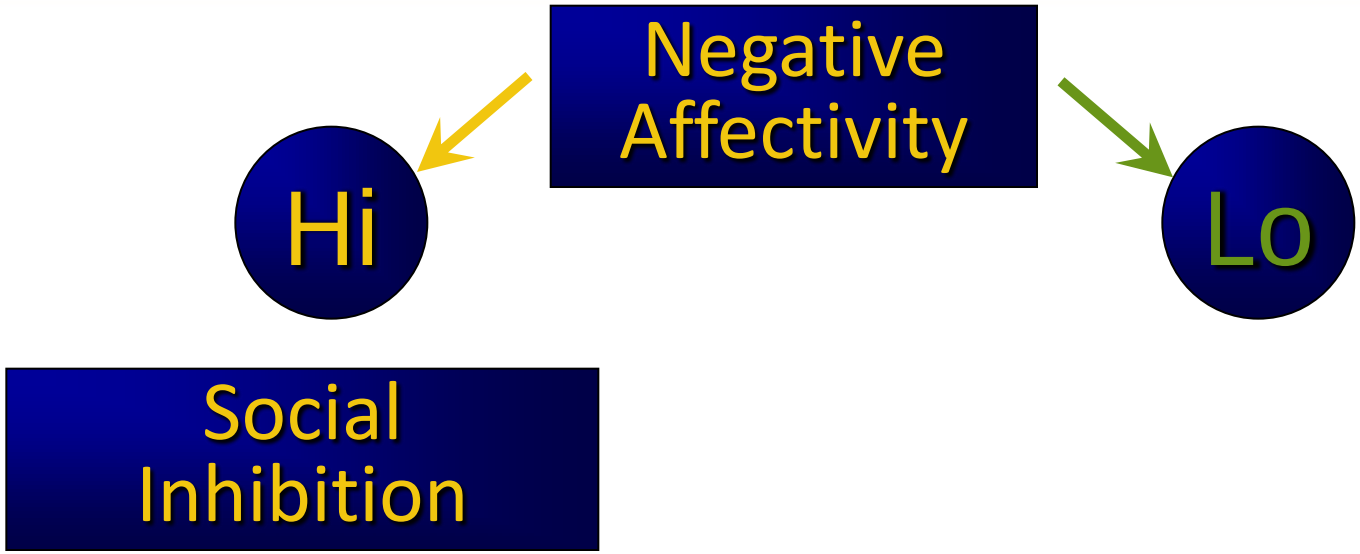
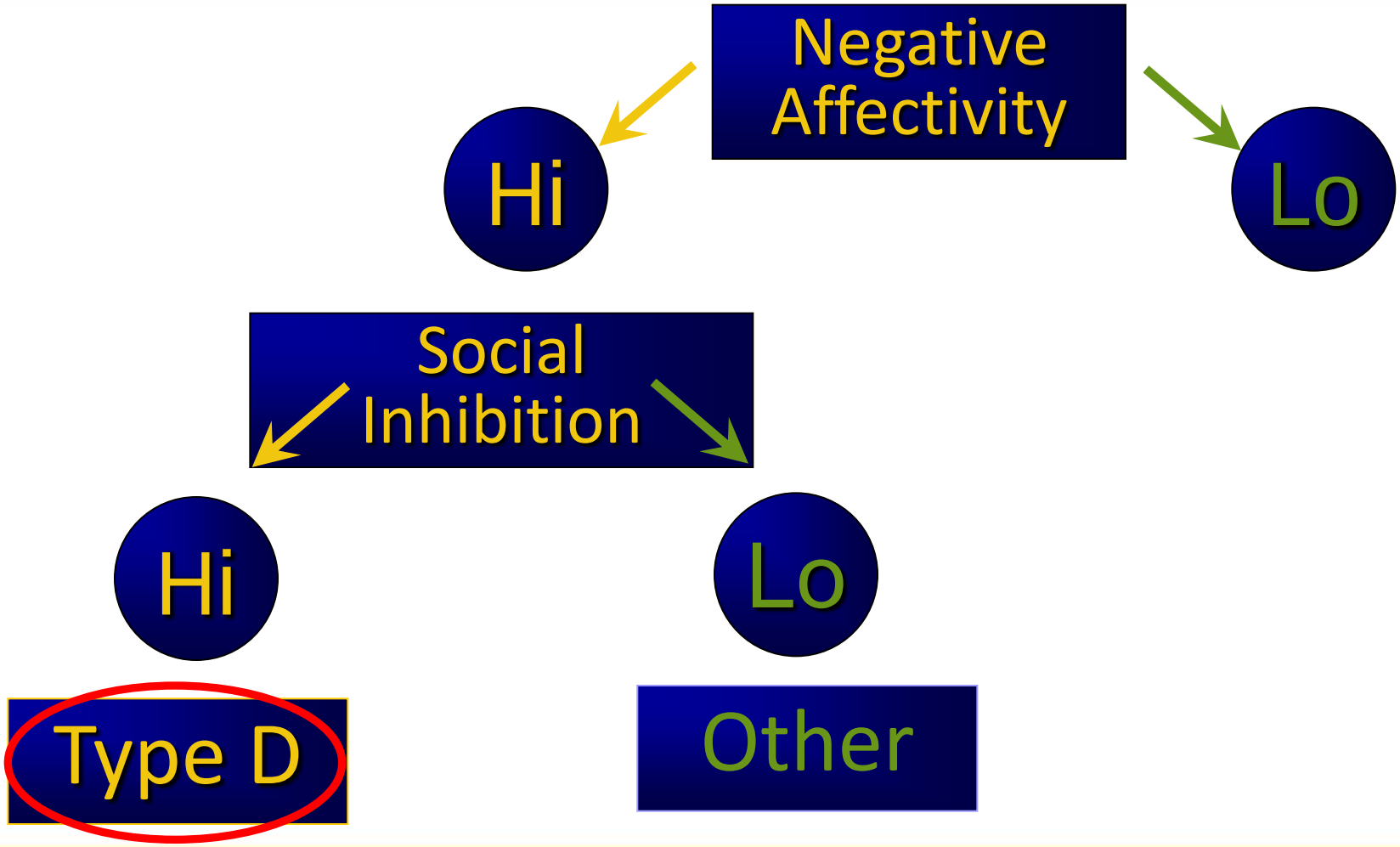
Type D personality traits



Type D personality traits

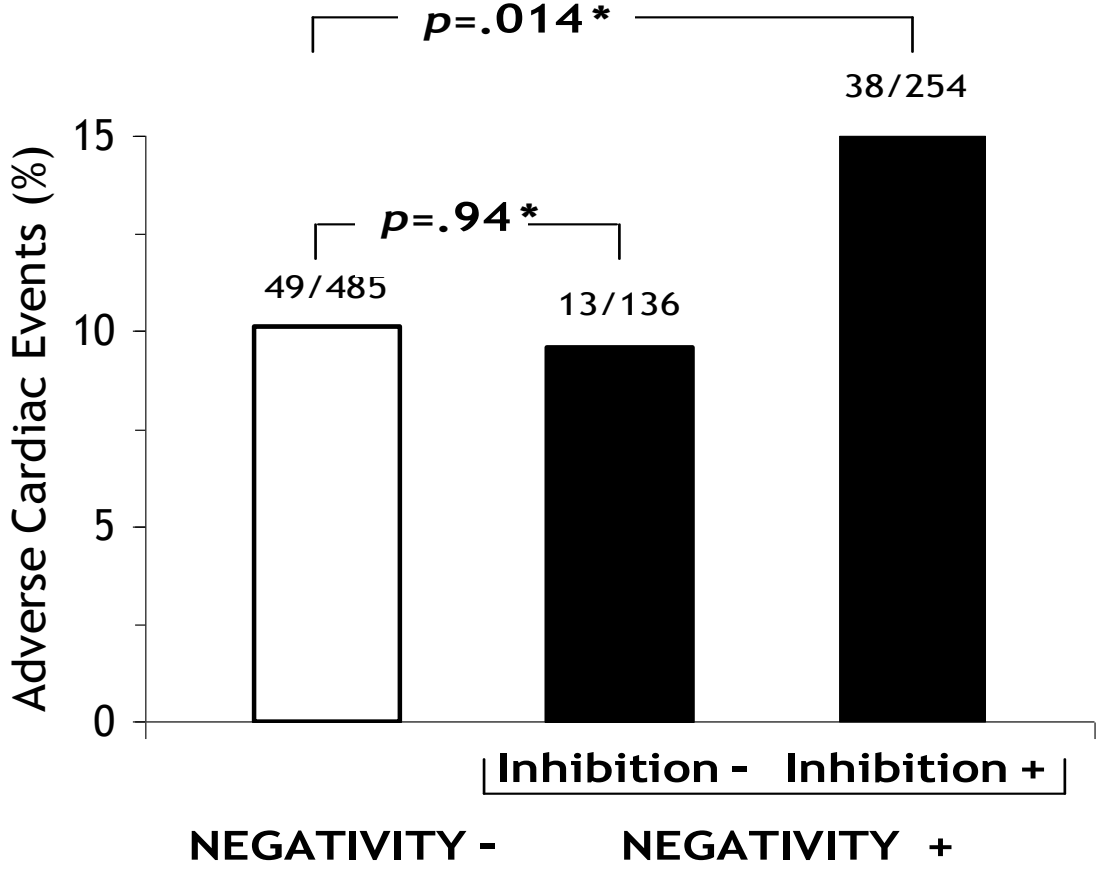


The burden of increased negative emotions and inhibition

No!!
I do not want to share my emotions with others…

Type D ?

Modulating effect of inhibition



RESEARCH Registry Erasmus Medical Center Rotterdam

Denollet, Pedersen et al. Eur Heart J 2006;27:171-7

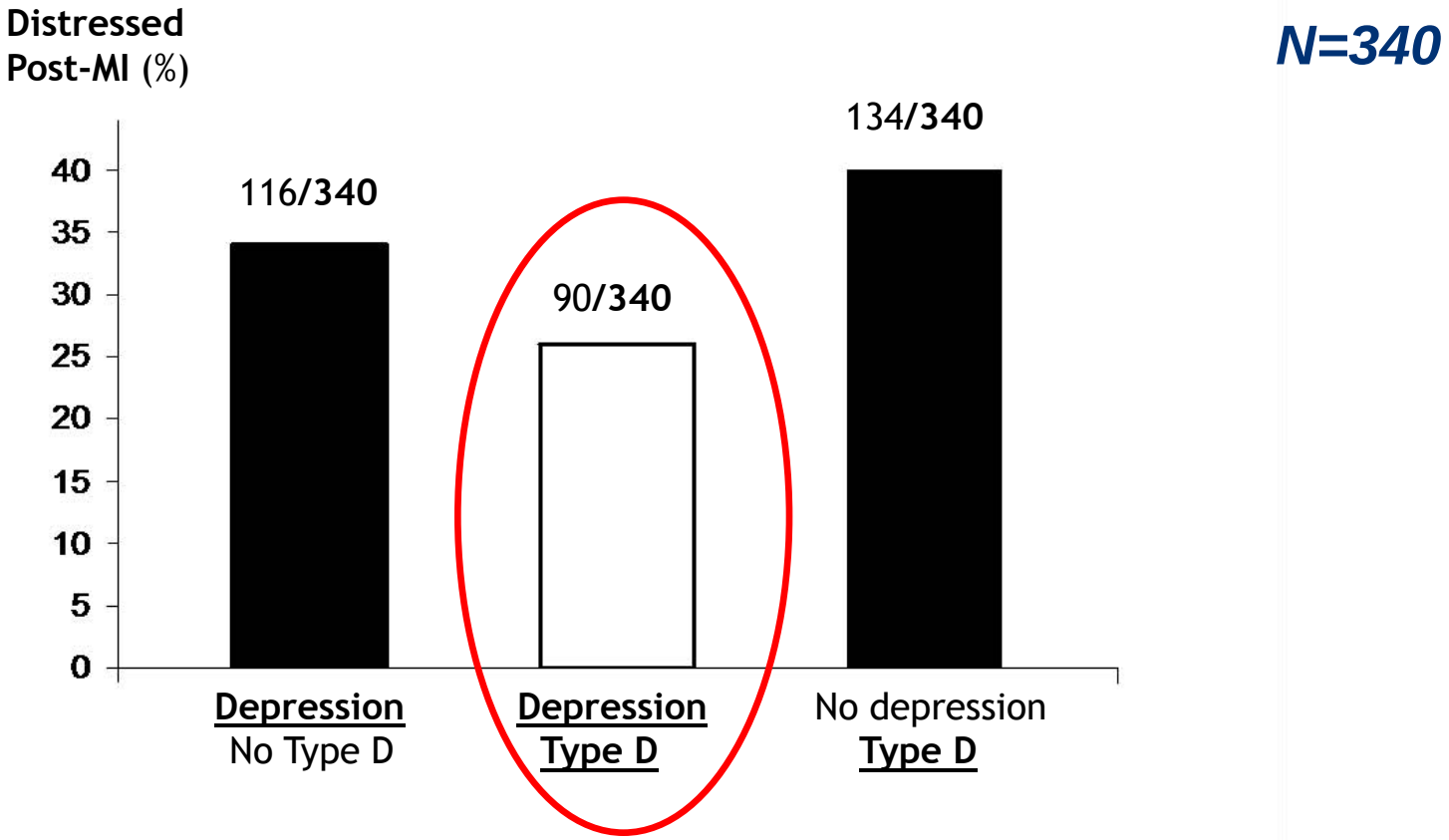
Depression *versus* Type D personality

Construct	Negative emotions	Social inhibition	Duration
Depression	Depressed affect in particular	Not specified	Episodic (<2 years)
Type D*	Negative affect in general (incl. worry, irritability)	Elevated levels (non-expression)	Chronic (≥2 years)

*Type D: normal personality construct *vs*. depression: pathology

Pedersen & Denollet. Curr Cardiol Rev 2006;2:205-13

Percentage of distressed post-MI patients, stratified by depressive disorder and Type D personality



Depression: patients who met ICD-10 criteria for major or minor depressive disorder as assessed by the Composite International Diagnostic Interview (World Health Organization, 1990)

Denollet et al. Psychol Med 2009;39:749–56

Head-to-head comparison of Type D *versus* depressive symptoms

Table. Predictors of Major Adverse Cardiac Events at the 5-Year Follow-up Examination[a]

Baseline Characteristic	Event Free, No. (%) (n=291)	Cardiac Events, No (%) (n=46)	Odds Ratio (95% Confidence Interval)	*P* Value
Univariate analysis				
Male sex	260 (89)	37 (80)	0.49 (0.22-1.11)	.09
Age ≤55 y	128 (44)	20 (44)	0.98 (0.52-1.83)	.95
Poor exercise tolerance	156 (54)	24 (52)	0.94 (0.51-1.76)	.86
Index MI at baseline	107 (37)	29 (63)	2.93 (1.54-5.59)	.001
LVEF ≤40%	24 (8)	9 (20)	2.71 (1.17-6.27)	.02
No CABG at baseline	93 (32)	33 (72)	5.40 (2.72-10.75)	<.001
Type D personality	75 (26)	23 (50)	2.88 (1.52-5.43)	.001
Depressive symptoms	90 (31)	23 (50)	2.23 (1.19-4.19)	.01
Multivariable analysis				
Index MI at baseline			1.14 (0.48-2.76)	.76
LVEF ≤40%			4.46 (1.71-11.63)	.002
No CABG at baseline			5.88 (2.29-15.06)	<.001
Type D personality			3.06 (1.48-6.33)	.003
Depressive symptoms			1.29 (0.62-2.66)	.49

Denollet & Pedersen. Arch Intern Med 2008;168:431-2

Unconfounded by disease severity

N = 475

- Type D personality in AMI patients was stable over an 18-month period*:

  T0 = 18.3%; T1 = 22.2%; T2 = 23.2%

- Type D was neither confounded by disease severity, nor other clinical and demographic variables nor anxiety and depressive symptoms

*longitudinal hierarchical latent class regression models (Latent GOLD)

Martens et al. J Psychosom Res 2007;63:545-50

Type D and primary care CHF patients (*N* = 363)

- **33.9% Type D patients**
- **Type D personality was not related to measures of disease severity:**
  - **NYHA class (χ^2 = 3.90; *p* = .14)**
  - **Goldman's Specific Activity Scale (SAS) (χ^2 = 4.50; *p* = .11)**

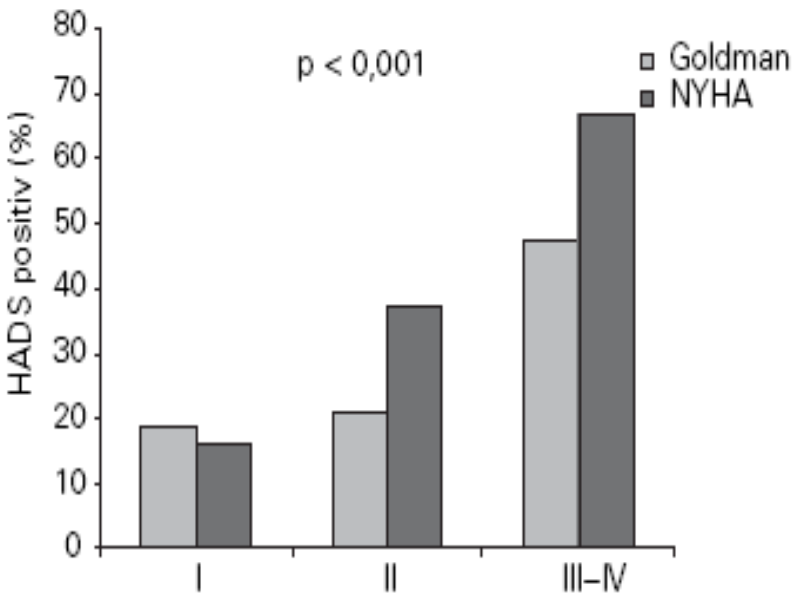


Abbildung 2. HADS und Schweregrad nach Goldman/NYHA.

Figure 2. Relationship between HADS and severity of heart failure measured by Goldman/NYHA.

Scherer,… & Herrmann-Lingen. Herz 2006;31:347-54

Type D Scale (DS14)

0=FALSE 1=RATHER FALSE 2=NEUTRAL 3=RATHER TRUE 4=TRUE

1 I make contact easily when I meet people - -	→	0	1	2	3	4
2 I often make a fuss about unimportant things	→	0	1	2	3	4
3 I often talk to strangers - - - - - - - - - - - - - -	→	0	1	2	3	4
4 I often feel unhappy - - - - - - - - - - - - - - -	→	0	1	2	3	4
5 I am often irritated - - - - - - - - - - - - - - -	→	0	1	2	3	4
6 I often feel inhibited in social interactions	→	0	1	2	3	4
7 I take a gloomy view of things - - - - - - - - -	→	0	1	2	3	4
8 I find it hard to start a conversation - - - - - -	→	0	1	2	3	4
9 I am often in a bad mood - - - - - - - - - - - -	→	0	1	2	3	4
10 I am a closed kind of person - - - - - - -	→	0	1	2	3	4
11 I would rather keep other people at a distance	→	0	1	2	3	4
12 I often find myself worrying about something	→	0	1	2	3	4
13 I am often down in the dumps - - - - - - - - -	→	0	1	2	3	4
14 When socializing, I don't find the right things to talk about	→	0	1	2	3	4

Denollet. Psychosom Med 2005;67:89-97

Cross-cultural validity

Established:

- Belgium
- China
- Denmark
- Germany
- Italy
- Netherlands
- Ukraine
- Hong Kong
- Norway

Submitted/in preparation:

- Iceland
- Russia

Czech Republic, Finland, Hungary, India, Indonesia, Iran, Ireland, Israel, Japan, Latvia, Lithuania, Pakistan, Poland, Portugal, Russia, Spain, South-Korea, Sweden, Turkey, United Kingdom, USA; all countries participating in the Euro-Cardio-QoL (ESC) project

Why look at personality factors?

- Emphasis on the studying of patient-centered outcomes and their determinants ⇒ identification of high-risk patients *[Krumholz et al. 2005]*
- Accumulating evidence that cardiac patients with a Type D personality comprise high-risk patients *[Pedersen & Denollet, 2006]*
- Personality factors may be less prone to the influence of acute events *[Nicholson et al. 2006]*
- Personality factors moderate the effect of treatment *[Gorwood et al. 2009; Tang et al. 2010]*

Overview

- The nature of Type D personality
- **Impact of Type D across heart diseases**
- Type D and cardiac rehabilitation
- Mechanisms
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Prevalence of Type D personality

- **Ischemic heart disease**: **25-36%**
  [Pedersen 2001, 2004, 2007; Al-Ruzzeh 2005; Denollet 2005; Whitehead 2007]
- **Chronic heart failure**: **21-45%**
  [Schiffer 2005,2007, 2009; Scherer 2006]
- **ICD**: **23-25%**
  [Pedersen 2004, 2007, 2008; van den Broek 2009]
- **Peripheral arterial disease**: **34-35%**
  [Aquarius 2005, 2007, 2008, 2009]
- **Hypertension**: **53%**
  [*Denollet 2005]*
- **General population**: **13-24%**
  [Pedersen et al, 2004; Denollet, 2005; Aquarius et al, 2005; Hausteiner et al, 2010]

Pedersen & Denollet. Curr Cardiol Rev 2006;2:205-13

PCI patients: Death/MI

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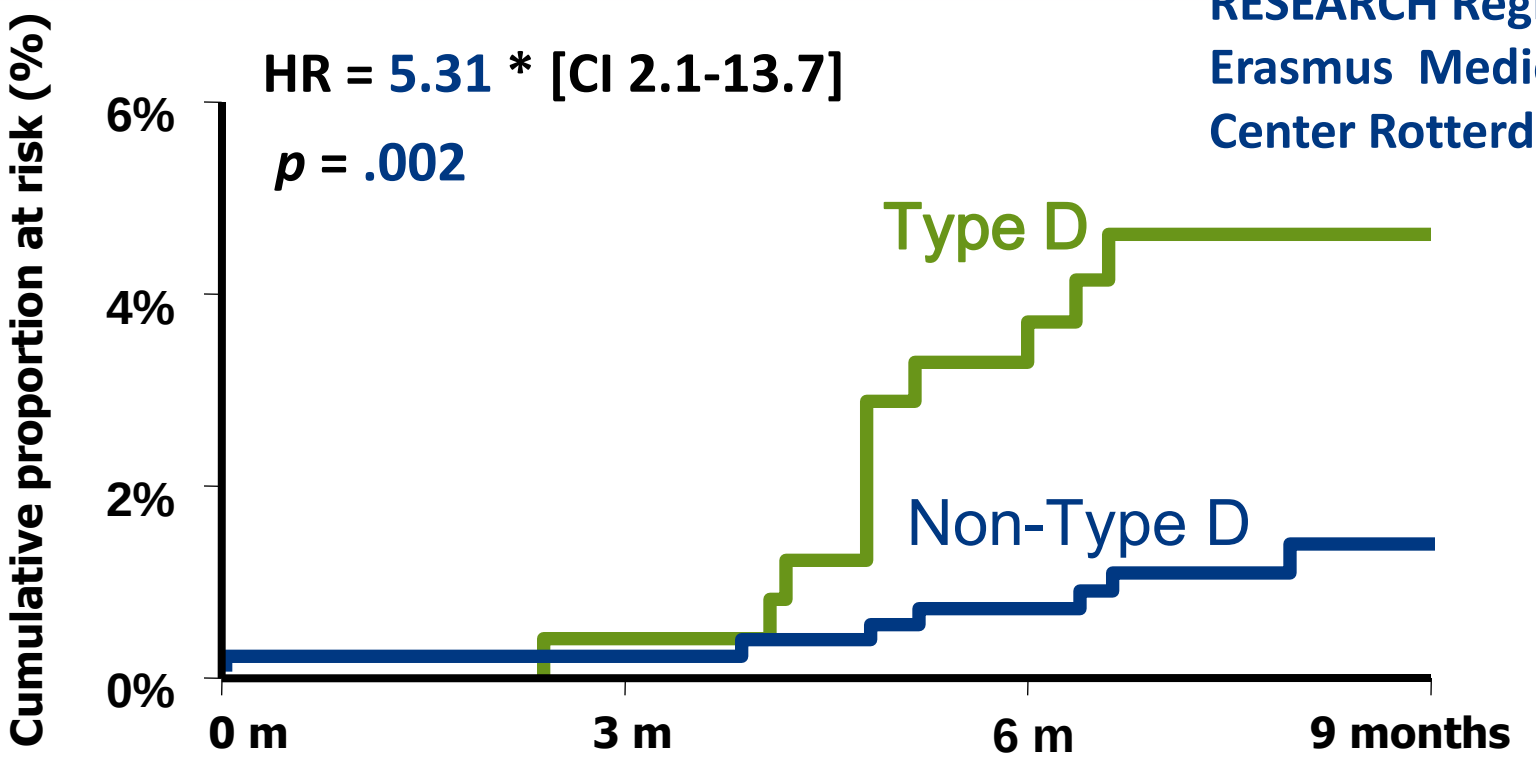


	0 m	3 m	6 m	9 months
Type D	254	253	244	242
Non-Type D	621	620	616	609

Numbers at risk

Pedersen et al. J Am Coll Cardiol 2004;44:997-1001

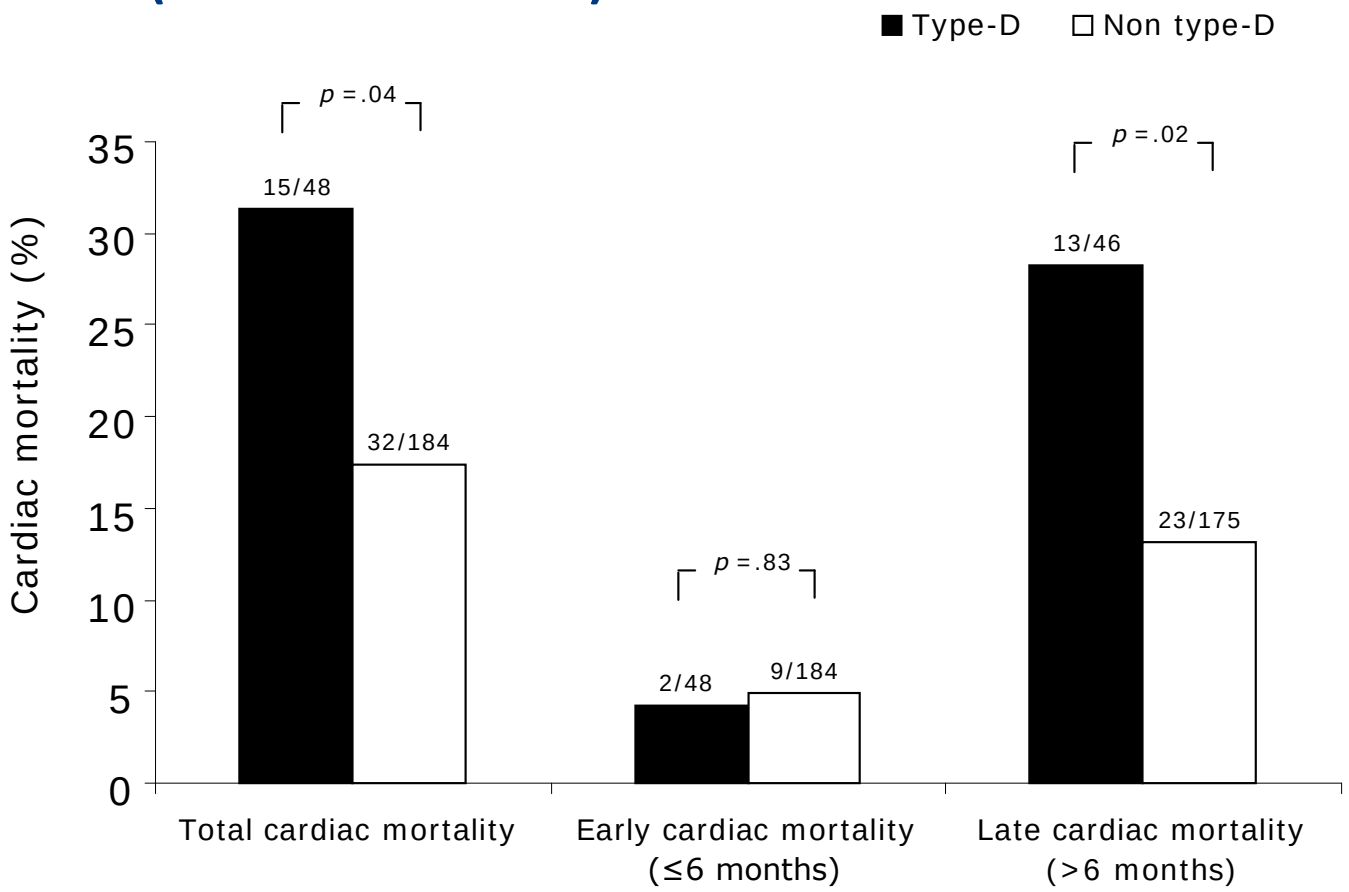
Consistency of findings

Type D and Clinical Events in CAD Patients

• Study #1	Lancet 1996	OR = 4.1
• Study #2	Circulation 1998	HR = 4.7
• Study #3	Circulation 2000	OR = 8.9
• Study #4	JACC 2004	HR = 5.3
• Study #5	Am J Cardiol 2006	OR = 4.8
• Study #6	Arch Intern Med 2008	OR = 3.1

Impact of Type D on mortality in CHF

***N* = 232 (47 cardiac deaths)**



Schiffer et al. Int J Cardiol 2009 Jan 20. [Epub ahead of print]

Type D and PAD: Poor prognosis

***N* = 186**

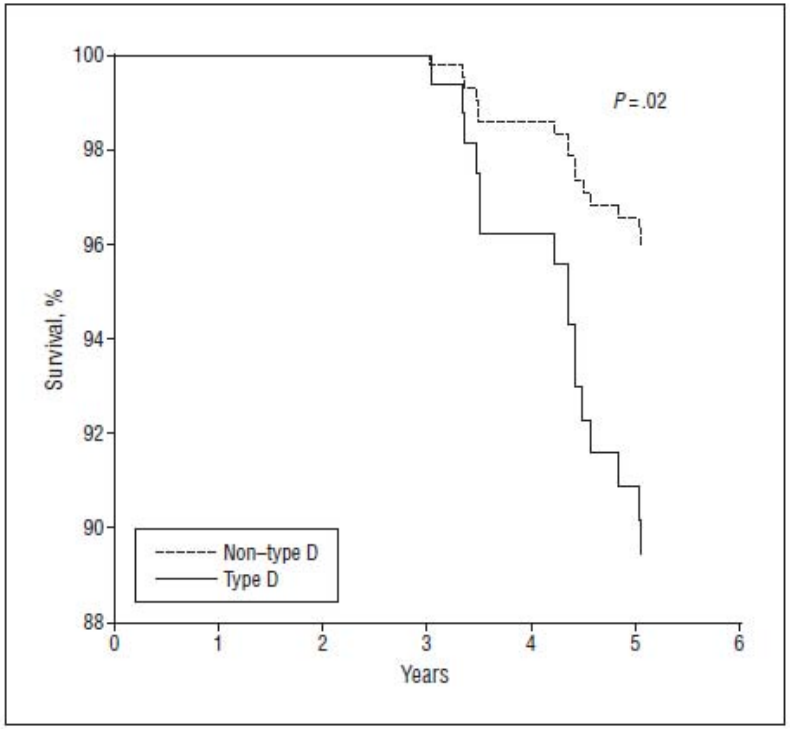


Figure 1. Cumulative survival across time stratified by type D personality.

Table 3. Independent Predictors of All-Cause Mortality in Patients With Peripheral Arterial Disease

Predictor	OR (95% CI)	*P* Value
Type D personality	3.5 (1.1-11.1)	.04
Age	1.1 (1.0-1.2)	.02
Male sex	2.3 (0.6-8.6)	.20
ABI	1.0 (0.9-1.0)	.34
Diabetes mellitus	2.3 (1.2-4.6)	.02
Renal disease	2.3 (1.0-5.3)	.04
Pulmonary disease	1.4 (0.7-3.2)	.37

Abbreviations: ABI, ankle-brachial index; CI, confidence interval; OR, odds ratio.

Aquarius, Smolderen et al. Arch Surg 2009;144:728-33

Anxious Type D patients with a defibrillator and increased VTs

***N* = 391**

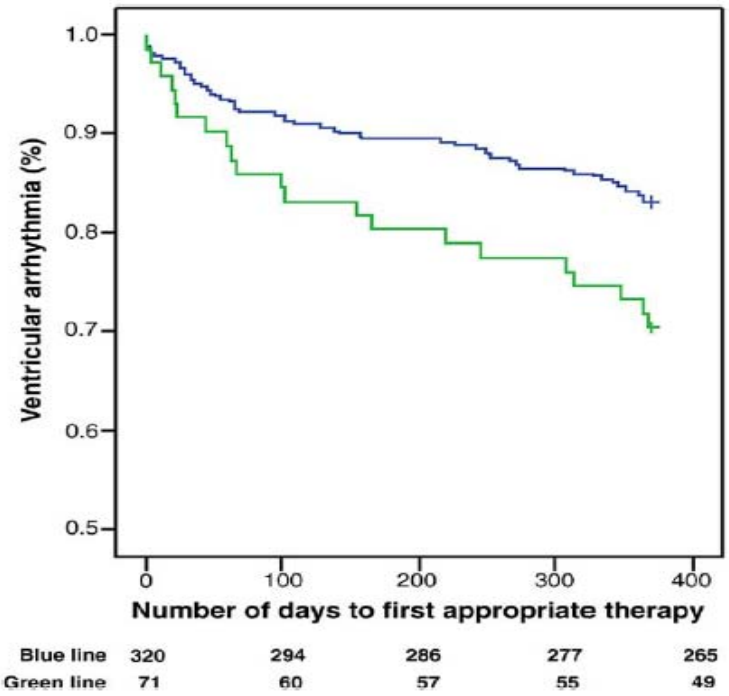


Figure 1 Kaplan-Meier Curve for Time to First Ventricular Arrhythmia in Type D Patients With Increased Anxiety (p = 0.012)

Other groups **(blue line)**; anxious Type D patients **(green line)**.

Table 3 Multivariable Predictors of Ventricular Arrhythmias

	Ventricular Arrhythmias		
	HR	95% CI	p Value*
Male	1.02	0.56–1.86	0.94
Age	0.98	0.96–1.01	0.16
Secondary prevention	**1.91**	**1.14–3.20**	**0.014**
Nonischemic etiology	1.08	0.61–1.92	0.80
Severely decreased ejection fraction†	1.30	0.63–2.67	0.47
Prolonged QRS duration‡	0.98	0.59–1.61	0.92
No prescription of angiotensin-converting enzyme inhibitor	1.05	0.62–1.76	0.86
No prescription of beta-blocker	1.54	0.89–2.66	0.12
Anxious Type D cluster	**1.72**	**1.03–2.89**	**0.039**

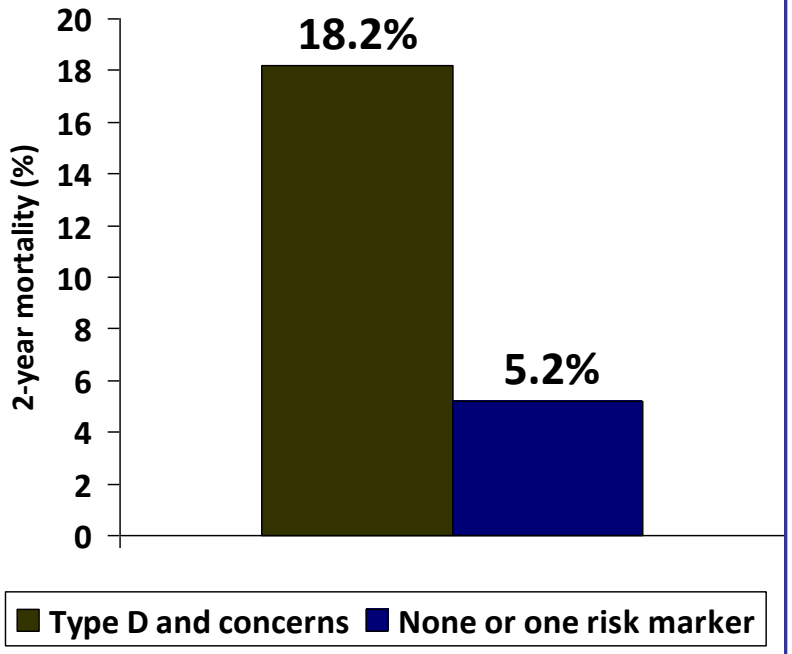
*p ≤ 0.10 are presented in **bold**. †Ejection fraction ≤35%. ‡QRS duration ≥120 ms. Abbreviations as in Table 2.

van den Broek, Denollet et al. JACC 2009;54:531-7

Clustering of Type D personality and high ICD pre-implantation concerns and mortality

***N* = 391**

HR: 3.65; 95%CI: 1.57-8.45; *p* = .003

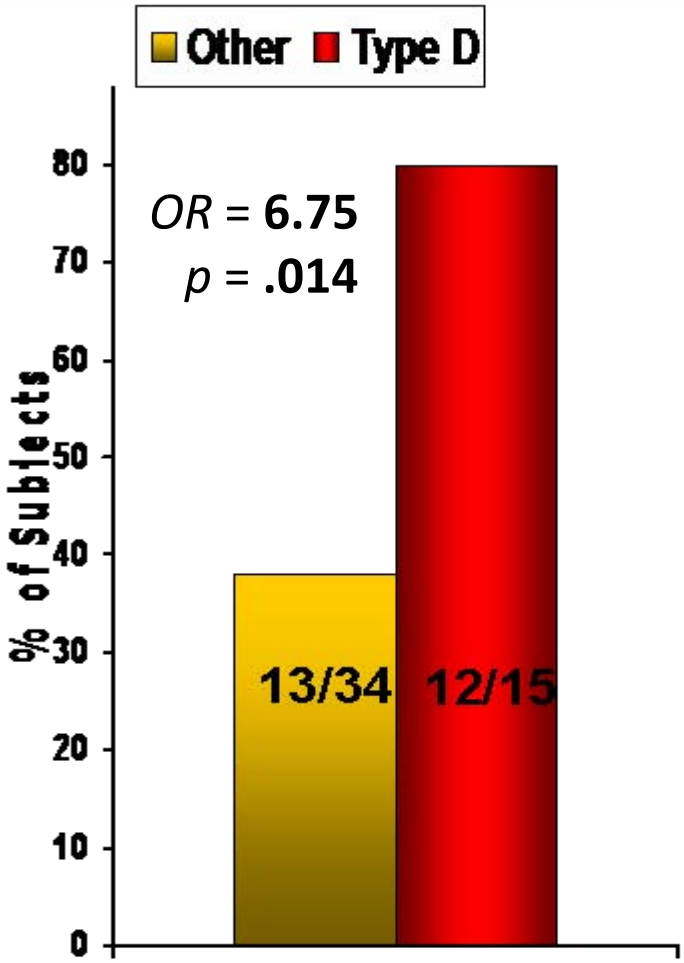


Multivariable predictors of 2-year mortality

	HR	[95% CI]	*p*
Type D and concerns	3.86	[1.64-9.10]	.002
Male sex	0.65	[0.23-1.82]	.41
Age	1.03	[0.99-1.08]	.14
Primary indication	0.68	[0.29-1.68]	.37
CAD etiology	2.08	[0.72-6.01]	.18
Any shock during fup	3.09	[1.36-7.04]	.007

Pedersen, Theuns et al. Submitted

Heart transplantation: unfavorable outcome



- **49** heart transplant recipients
- **15** Type D patients pre-HTX
- **5.4** years of follow-up (mean)
- **25** had unfavorable outcome

  long-term death (n = 6)
  rejection grade ≥3A
  early rejection

Type D sign. associated with
long-term death (p = .013)
early rejection (p = .032)

Denollet et al. J Heart Lung Transplant 2007;26:152-8

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- **Type D and cardiac rehabilitation**
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- Conclusions

CICRP

June 2008, Volume 16, No.2

Current Issues in Cardiac Rehabilitation and Prevention

Psychosocial Issues in Cardiac Rehabilitation

Official publication of:

CACRC

Canadian Association of Cardiac Rehabilitation

Does Personality Matter After All? Type D Personality and its Implications for Cardiovascular Prevention and Rehabilitation

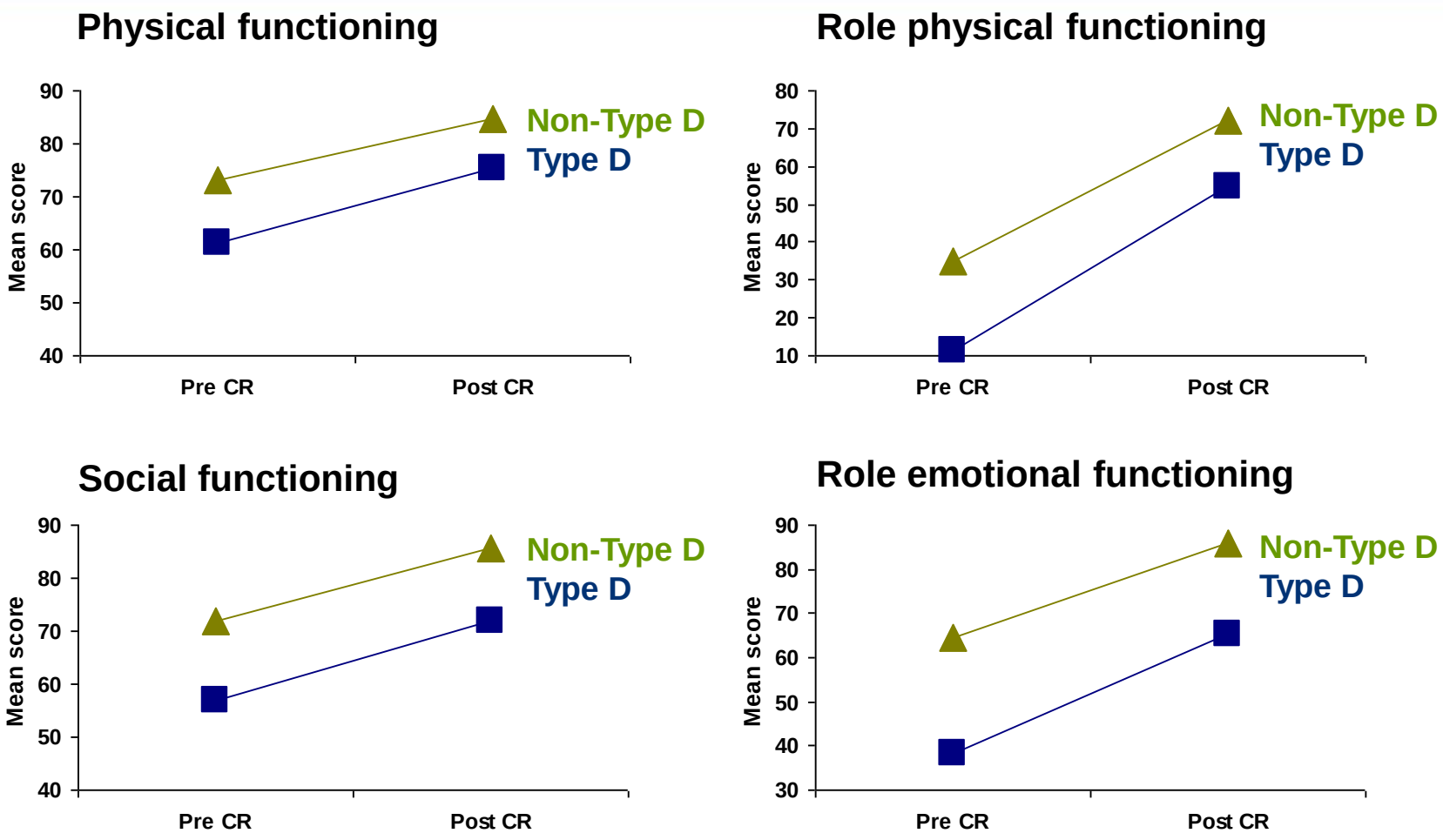
Heather Tulloch, PhD, Robert Pelletier, MSW

MINTO Prevention and Rehabilitation Centre, University of Ottawa Heart Institute

Two main questions

- Do Type D patients experience benefits from cardiac rehabilitation?
- Is it possible to change Type D – and is this the way forward with respect to moderating the effects of Type D on health outcomes?

Type D: Changes in health status



Pelle, Pedersen et al. Ann Behav Med 2008;36:167-75

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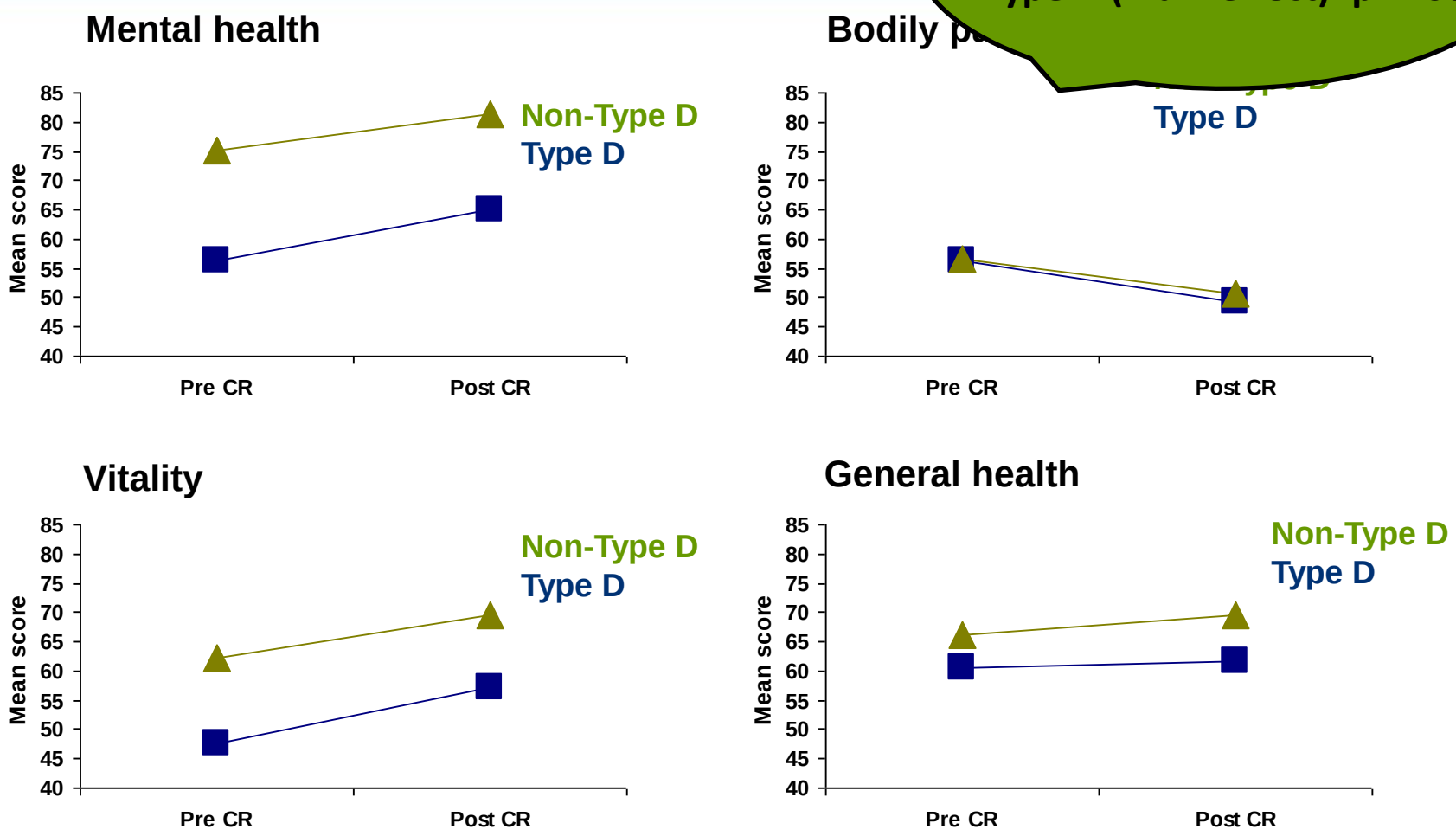
Type D: Changes in status

Time: p < .001
Time x Type D: p = .23
Type D (main effect): p < .001



Pelle, Pedersen et al. Ann Behav Med 2008;36:167-75

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Type D: Distress and poor quality of life

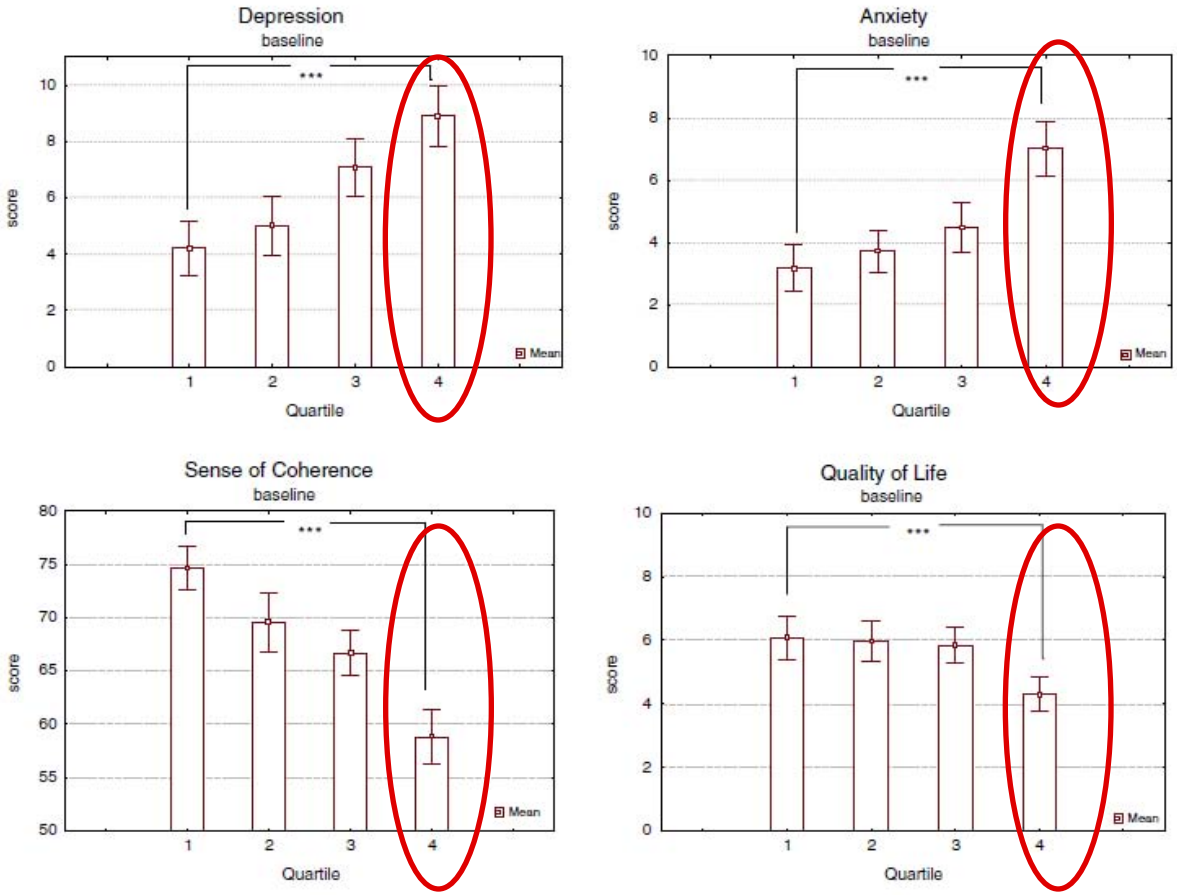
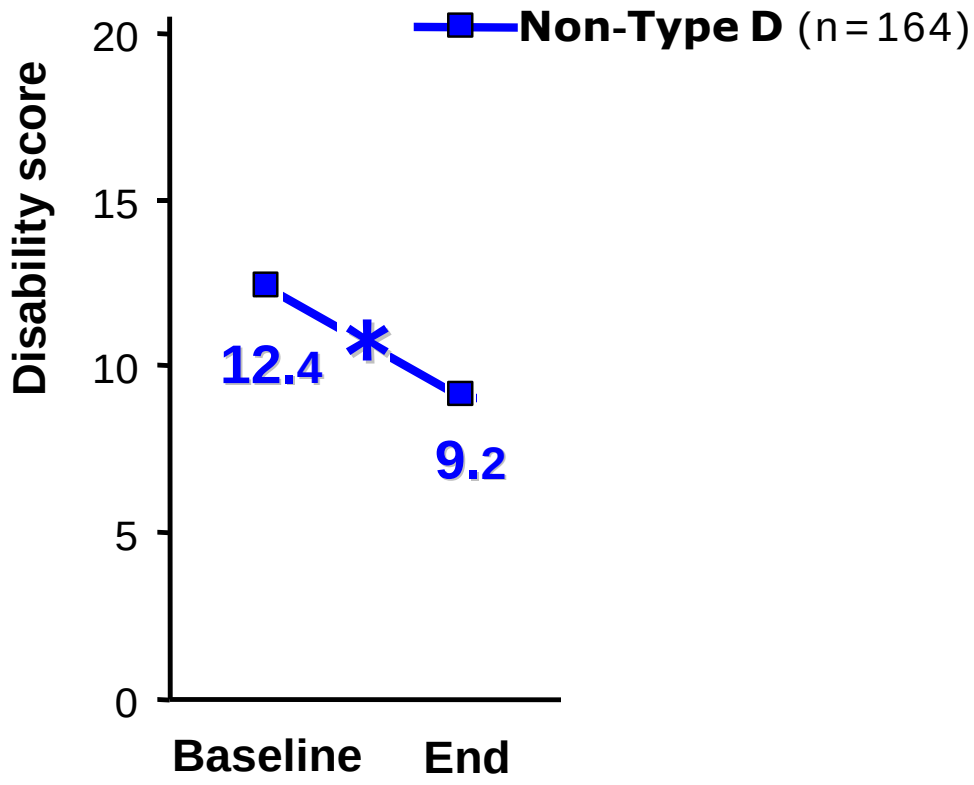


Fig. 2 Depression, Anxiety, Sense of Coherence value and Quality of Life score in relation to type D score (Q1–Q4) at baseline. Values are means with an indication of 95% Confidence Intervals (CI). ***$p < 0.001$

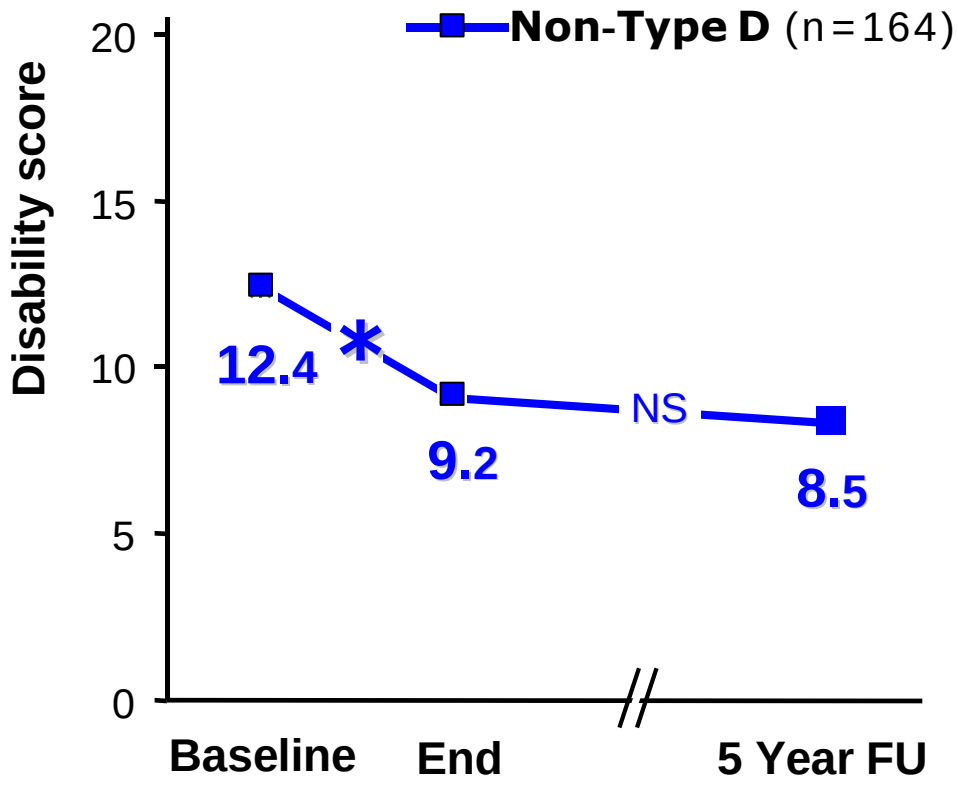
Karlsson et al. J Behav Med 2007;30:253–61

Type D: Reduction in disability in over time



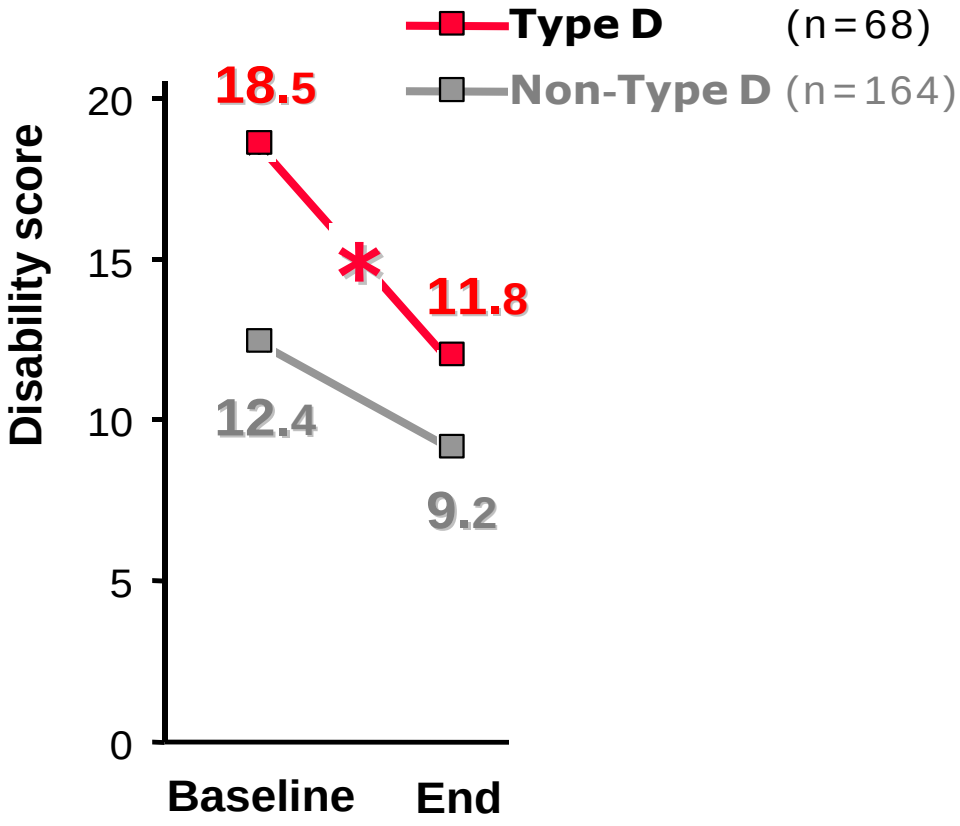
- Effect Program
  p<.0001

Denollet et al. Unpublished data



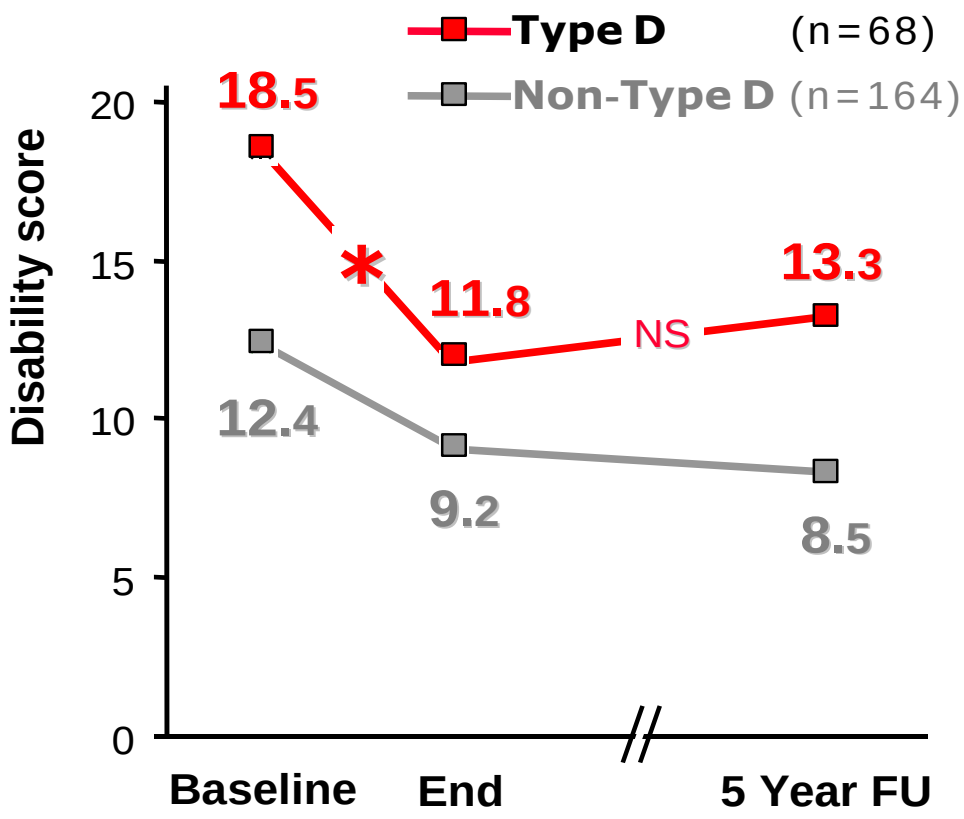
- Effect Program
  p<.0001
- Stability (5y FU) effect program

Denollet et al. Unpublished data



- Effect Program
  p<.0001
- Stability (5y FU) effect program
- Type D x Change
  p=.01

Denollet et al. Unpublished data



- Effect Program p<.0001
- Stability (5y FU) effect program
- Type D x Change p=.01
- Stability (5y FU) effect Type D

Denollet et al. Unpublished data

Type D: Poor quality of life and mortality

TABLE 4. Independent Predictors of Impaired QOL

Variable	OR	95% CI	*P*
Poor perceived health*			
Failure to quit smoking	2.3	1.2–4.5	0.014
Symptoms of depression	3.3	1.9–5.8	0.0001
Type D personality	2.2	1.2–3.8	0.007
LVEF≤50%	2.0	1.0–3.9	0.049
History of hyperlipidemia	2.0	1.1–3.4	0.016
Depressive affect†			
Failure to quit smoking	2.6	1.3–5.1	0.009
Symptoms of depression	2.7	1.5–5.2	0.002
Type D personality	2.6	1.4–4.8	0.002
Female sex	3.0	1.1–8.1	0.032
Symptoms of anxiety	2.5	1.3–4.6	0.005

*n=104 of 299 patients.
†n=82 of 299 patients.

TABLE 3. Independent Predictors of 5-Year Prognosis

Variable	OR	95% CI	*P*
Cardiac events*			
LVEF≤50%	3.9	1.4–11.1	0.009
Type D personality	8.9	3.2–24.7	0.0001
Age≤55 y	2.6	1.0–6.6	0.05
Total events†			
LVEF≤50%	2.9	1.4–6.0	0.004
Type D personality	4.5	2.3–8.5	0.0001

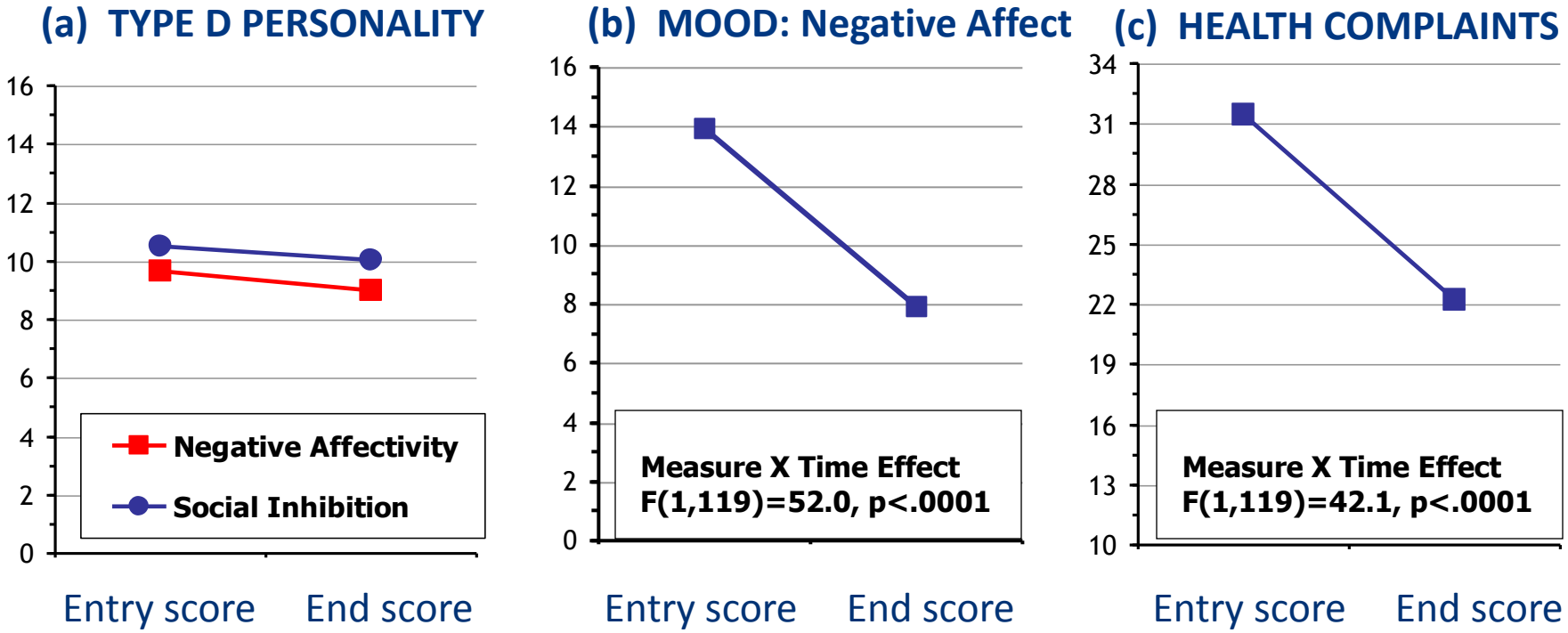
*Fatal and nonfatal cardiac events (n=22).
†Cardiac events plus revascularization procedures (n=49).

Denollet et al. Circulation 2000;102:630-5

Type D: Stable over time

Entry: baseline assessment
End: following rehabilitation

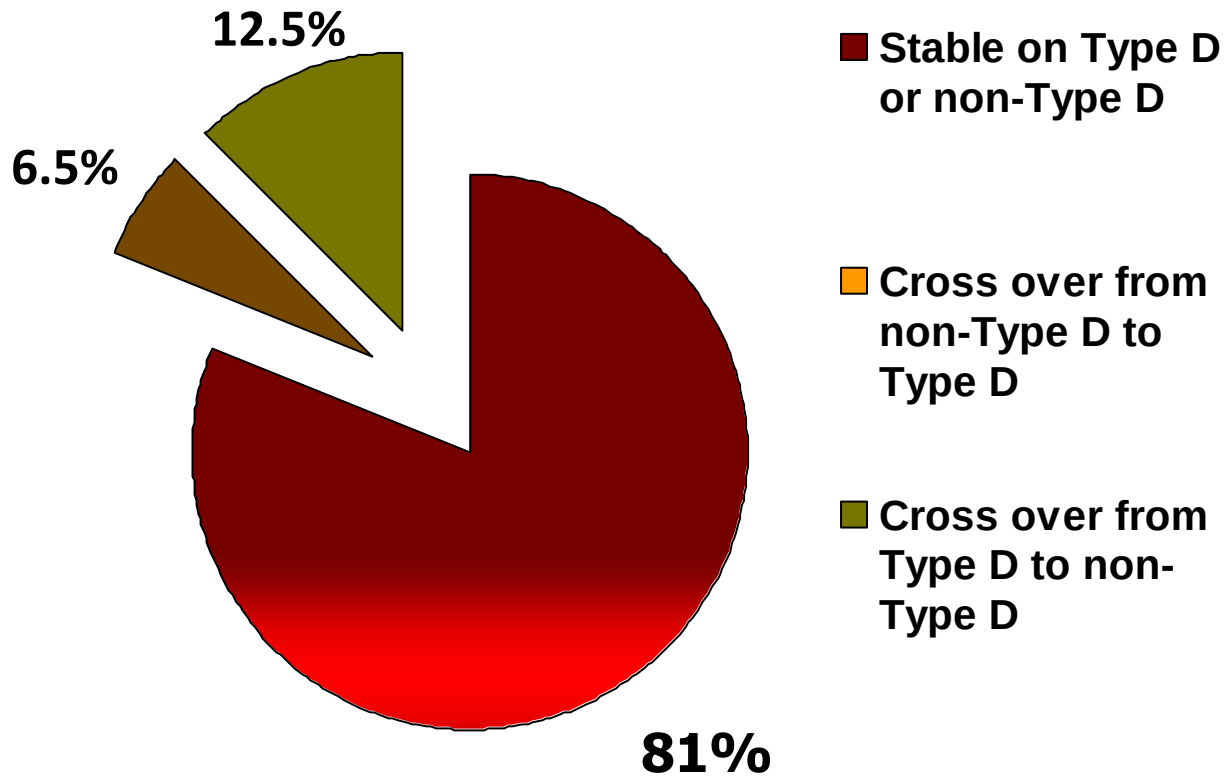
N = 121 cardiac patients



Denollet. Psychosom Med 2005;67:89-97

Type D: Stable over time

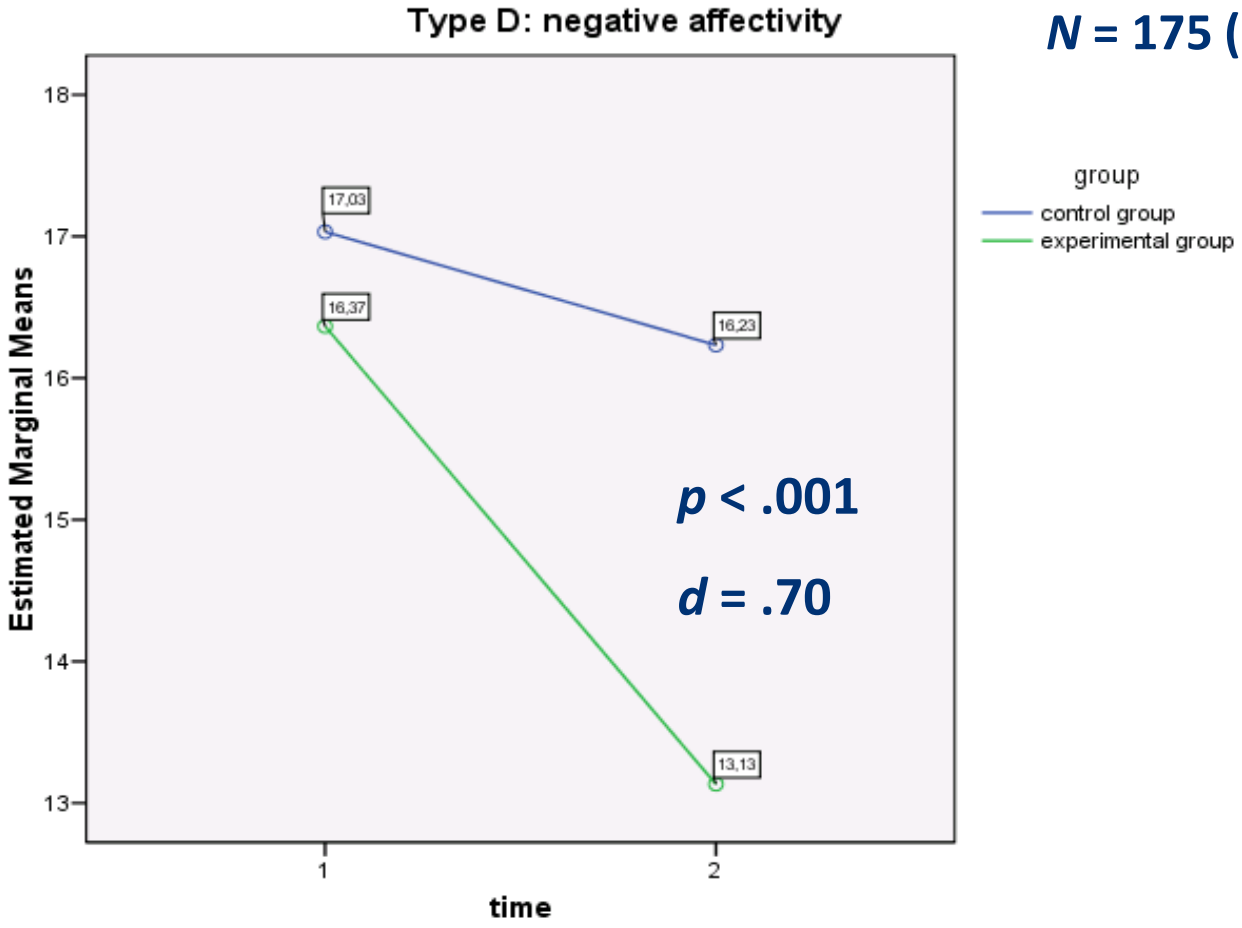
There was a 5.9% reduction in patients with a Type D personality from 26.6% prior to CR to 20.7% post CR (*p* = .012)



N **= 368**

Pelle, Pedersen et al. Ann Behav Med 2008;36:167-75

Change in negative affectivity



N **= 175 (healthy population)**

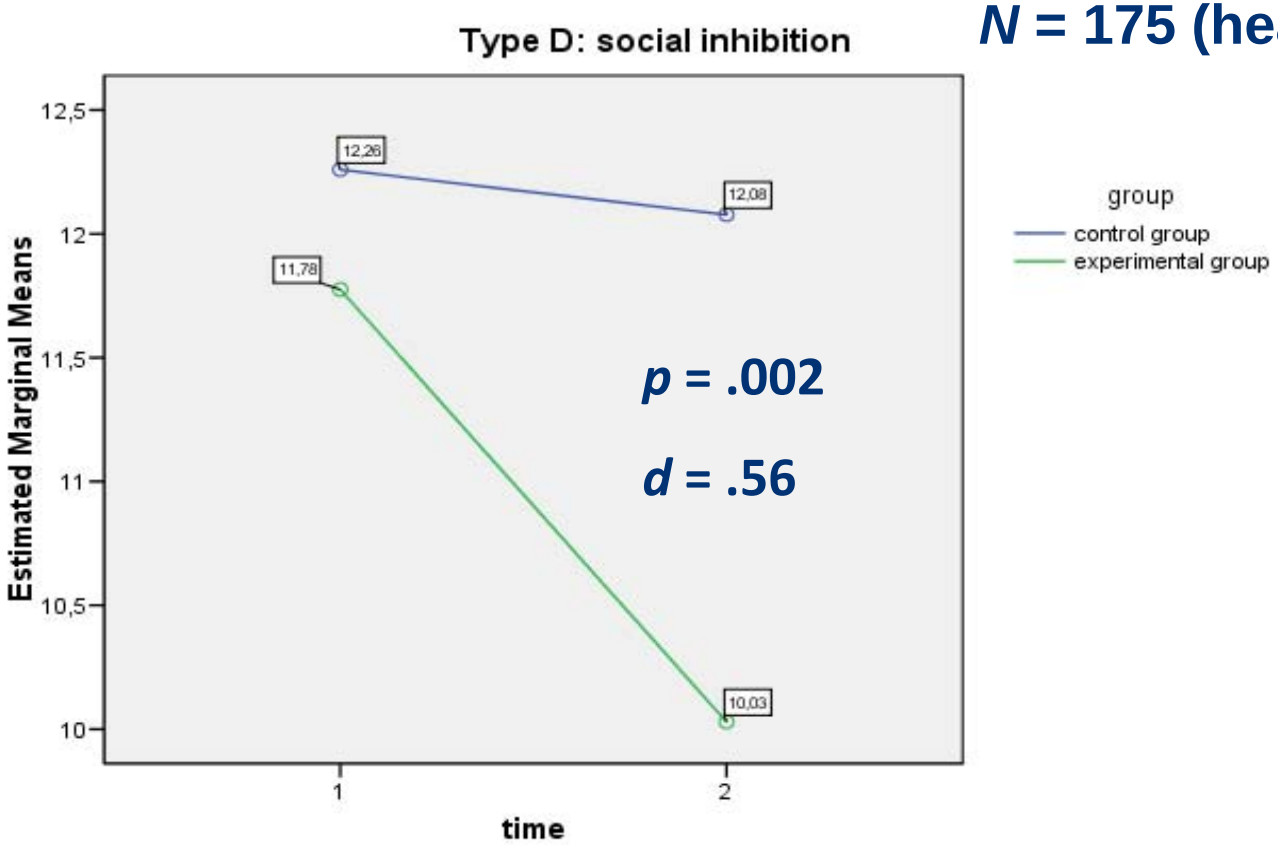
p **< .001**

d **= .70**

Nyklicek et al. In preparation

Change in social inhibition

N **= 175 (healthy population)**



p **= .002**

d **= .56**

Nyklicek et al. In preparation

Change in Type D caseness

	MBSR group (n=73)			Control group (n=72)		
	Before	After	change	Before	After	change
Type D: N	**39**	**33**	**-6**	**45**	**38**	**-7**
%	**52.8%**	**47.2%**		**62.5%**	**52.8%**	

Nyklicek et al. In preparation

Type D: Change in caseness

Table 3 Type D score, depression and anxiety score at baseline and after 1 year in patients in the upper quartile of type D score (Q4)

	Baseline	12 months
Type D		
Intervention	52.1 ± 6.5	47.7 ± 8.4**
Control	53.6 ± 7.9	52.4 ± 9.2
Depression		
Intervention	8.0 ± 3.4	6.7 ± 3.1*
Control	9.4 ± 4.4	8.4 ± 4.0
Anxiety		
Intervention	6.8 ± 3.0	5.3 ± 3.0*
Control	7.2 ± 3.6	6.6 ± 3.8

Intervention: $n = 29$ and Control: $n = 26$. Mean (±SD)

* $p < 0.05$, ** $p < 0.01$ (ANOVA: change over time)

Karlsson et al. J Behav Med 2007;30:253–61

Type D: Response to anti-depressant treatment in MIND-IT

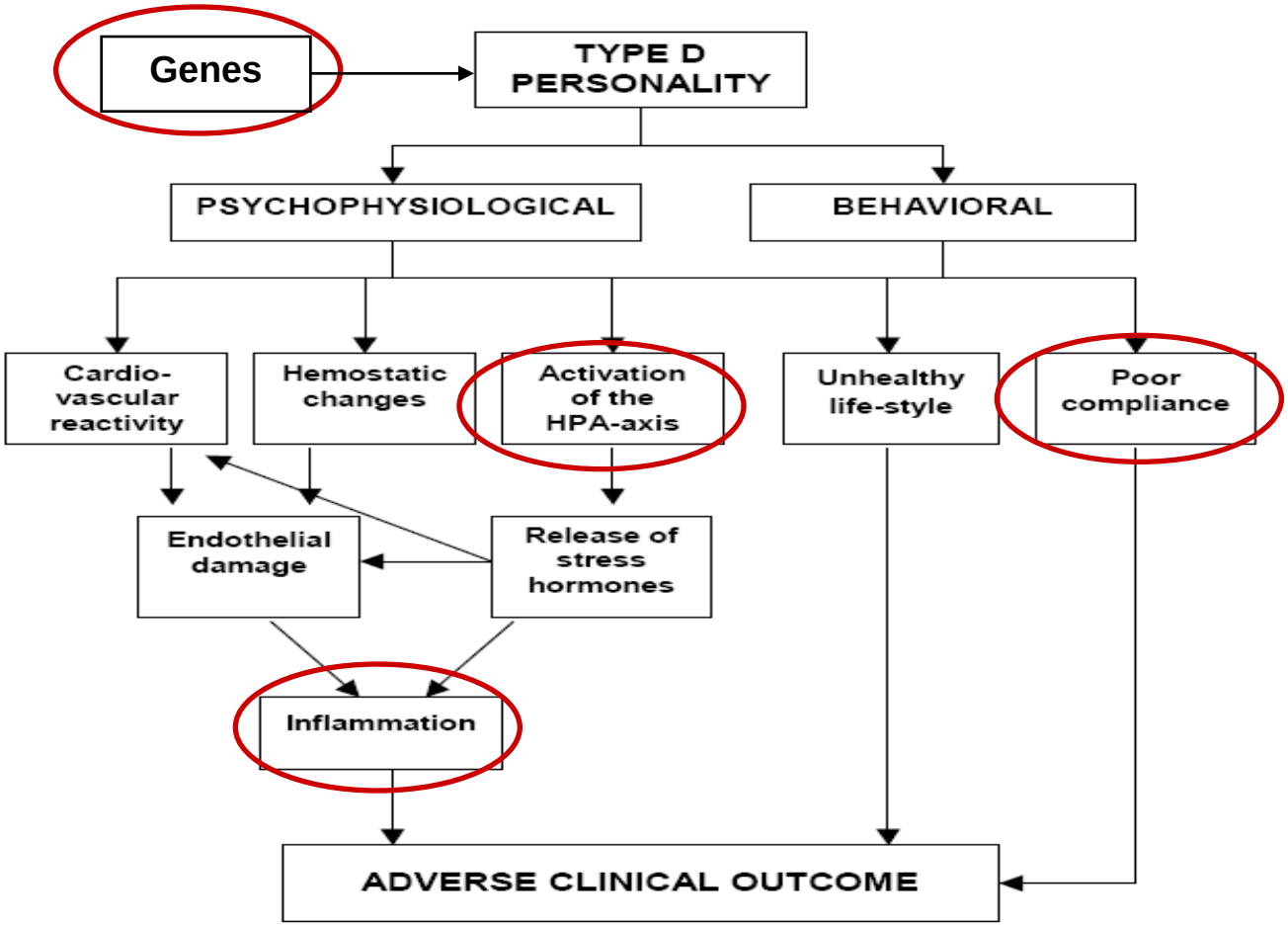
	Intervention (n = 116)	Usual care (n = 89)	p
Type D caseness			
Type D personality	60.3%	73.0%	0.06
Type D subdomains			
Negative affectivity, mean ±SD	13.9 (7.2)	15.1 (7.1)	0.21
Social inhibition, mean ±SD	17.1 (7.5)	19.5 (7.9)	0.03

Pedersen, Denollet & de Jonge. In preparation

Overview

- The nature of Type D personality
- Impact of Type D across heart diseases
- Type D and cardiac rehabilitation
- **Mechanisms**
- Conclusions

Mechanisms



Pedersen & Denollet. Curr Cardiol Rev 2006;2:205-13

Overview

- The nature of Type D personality
- Impact of Type D across heart diseases
- Type D and cardiac rehabilitation
- Mechanisms
- **Conclusions**

Take home message…

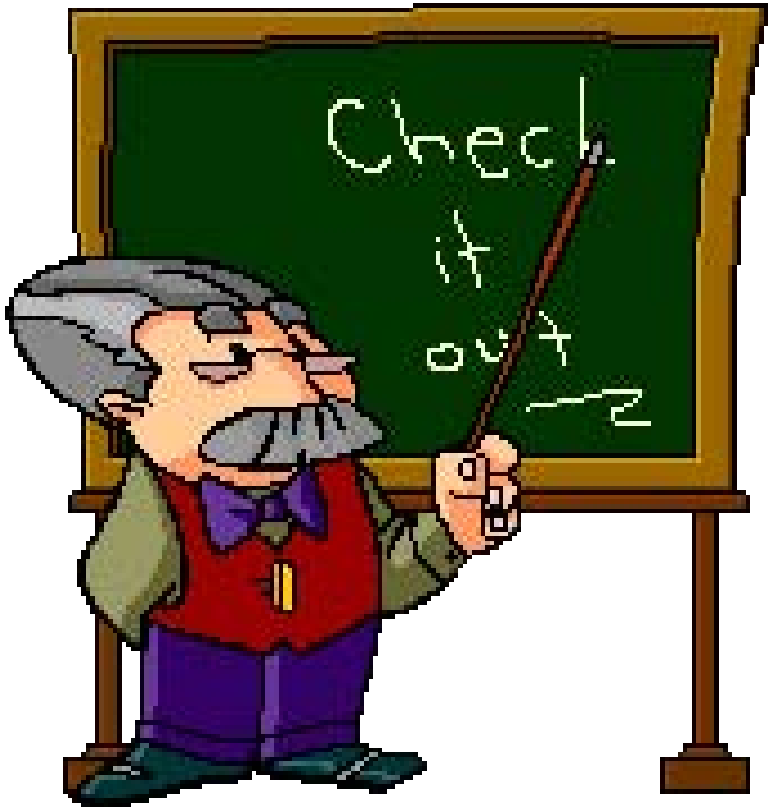
Type D patients:

- **Benefit from CR in terms of improved health status**
- **Still report poorer health status than non-Type D patients**
- **Mixed/little evidence of changeability in Type D caseness – probably not way forward**
- **Type D patients are high-risk**
- **Intervention trials are needed, but in the meantime…**

Tips for dealing with Type D patients in clinical practice

- ✓ **Refer** Type D patients to **CR** – they **benefit**
- ✓ Know who they are – **screen** with the DS14
- ✓ Establish a **good rapport** with patients and partners
- ✓ Look at **body language** and **non-verbal cues**
- ✓ Check if their **medication** and **general treatment** can be **optimized** further
- ✓ Referral to **mental health professional** if available

Type D or not Type D?



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(Eds. J Camm, T Lüscher P Serruys).
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