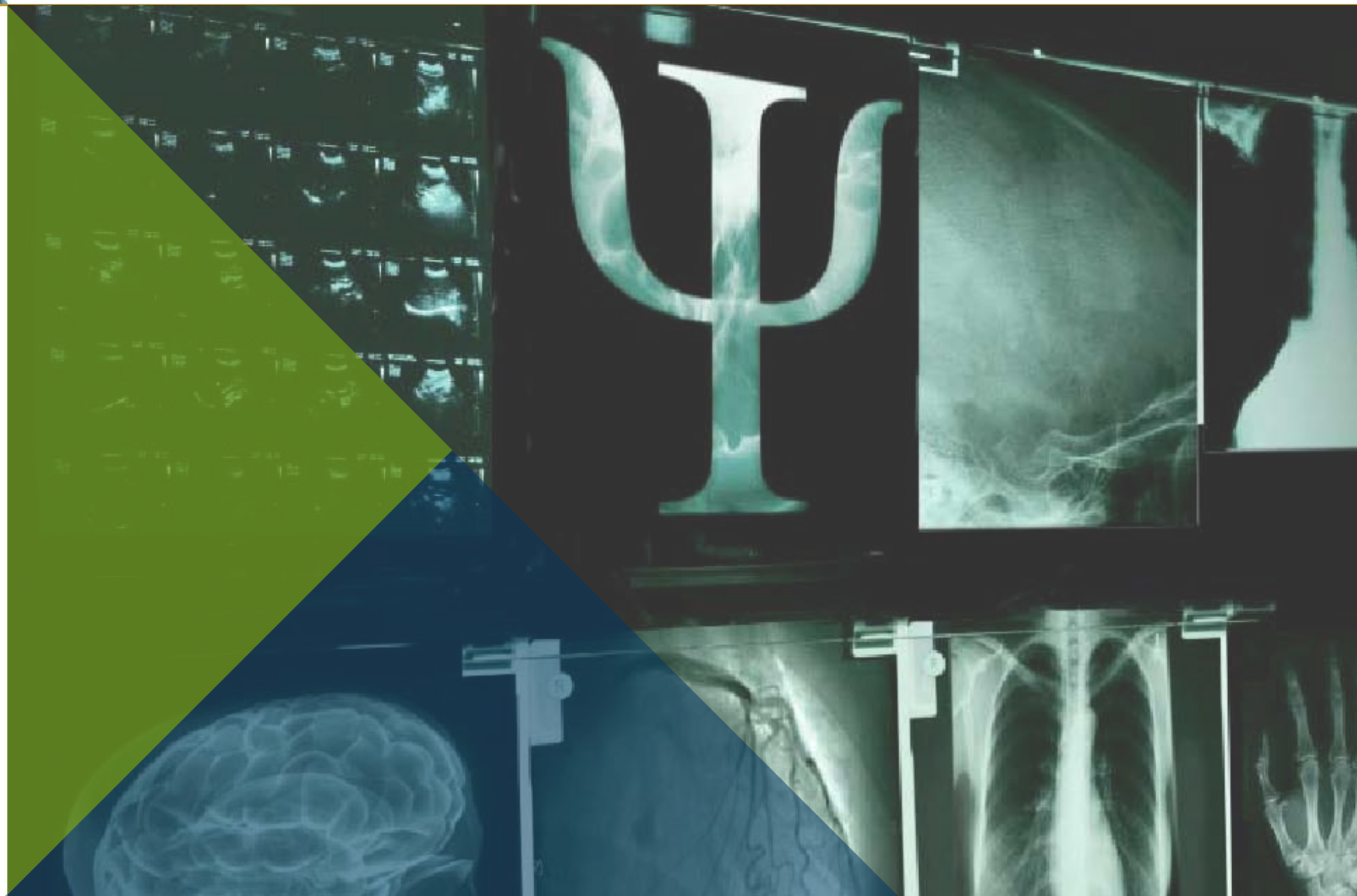
CoRPS

Center of Research on Psychology in Somatic diseases

Highlights – research on patients with an ICD

Susanne S. Pedersen, Professor of Cardiac Psychology



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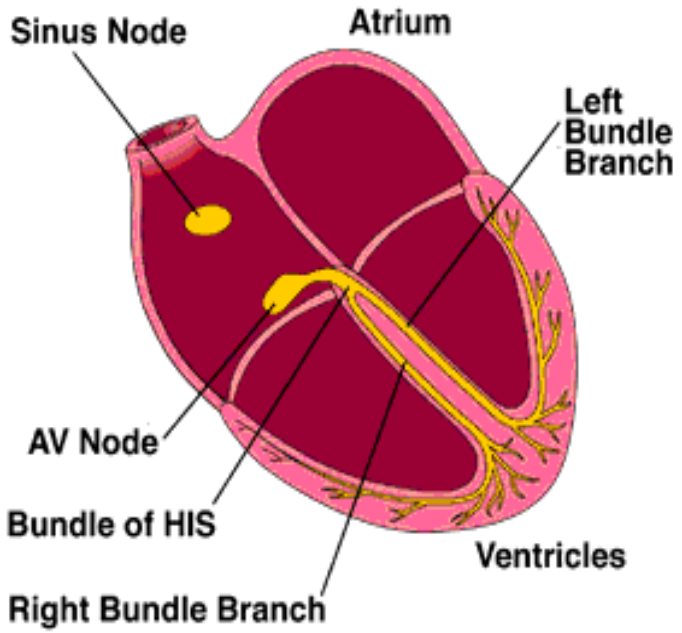
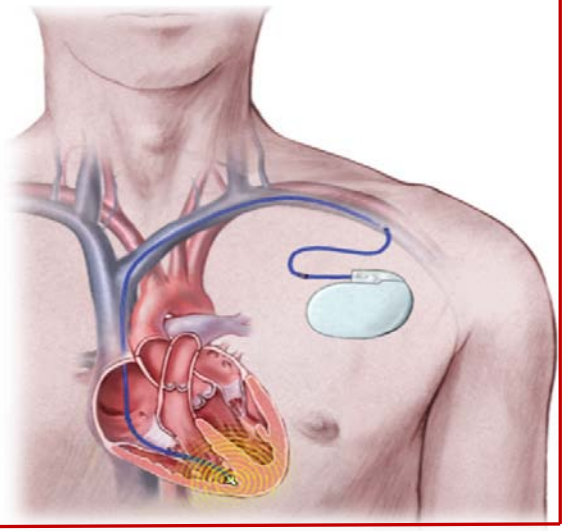
The implantable cardioverter defibrillator (ICD)



TRANSVENOUS ICD:
Leads in or on the heart



- **Used as primary and secondary prevention of sudden cardiac death**
- **ICD is superior to anti-arrhythmic drugs in saving lives**
- **The ICD can shock with up to 700-800 volts**

Ahmad et al. PACE 2000;23:931-3
Crespo et al. Am J Med Sci 2005;329:238-46

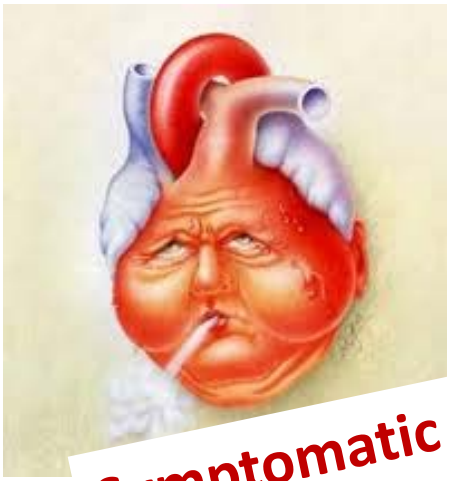
ICD therapy: Challenges to patients

New hardware

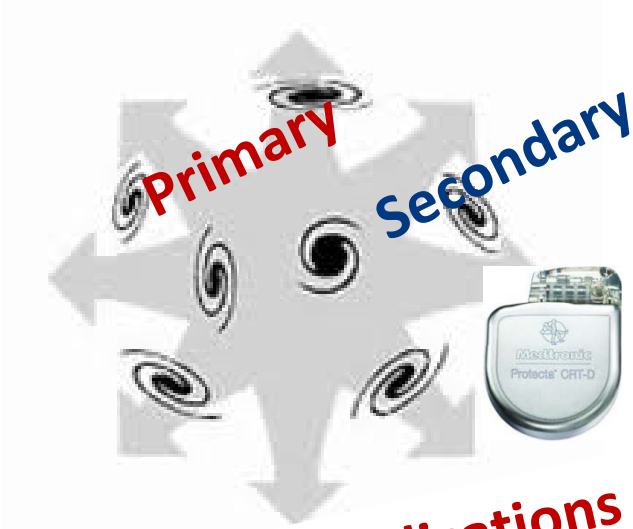
Home monitoring

Device advisories

Fractured leads



Symptomatic heart failure



Expanding indications

ICD shock

CoRPS

Let's not forget....

Patient's personality and pre-implantation psychological functioning

Prevalence of distress in ICD patients

Depression: 11% to 28%
Anxiety: 11% to 26%

The prevalence of anxiety and depression in adults with implantable cardioverter defibrillators: A systematic review

Gina Magyar-Russell [a,*], Brett D. Thombs [b], Jennifer X. Cai [c], Tarun Baveja [d], Emily A. Kuhl [e], Preet Paul Singh [f], Marcela Montenegro Braga Barroso [g], Erin Arthurs [b], Michelle Roseman [b], Nivee Amin [c], Joseph E. Marine [c], Roy C. Ziegelstein [c]

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[d] All India Institute of Medical Sciences, New Delhi, India
[e] American Psychiatric Association, Arlington, VA, United States
[f] Internal Medicine, University of Alabama at Birmingham, Birmingham, Alabama, United States
[g] Federal University of Ceará, Medicine School, Fortaleza, Ceará, Brazil

- **Posttraumatic stress ≈ 12%**
- **Chronic anxiety ≈ 50%**

→ **Subset of patients:**

1 in 4 (25%)

Versteeg et al. Int J Cardiol 2011;146:438-9; Pedersen et al. Int J Cardiol 2011;147:420-3; von Känel et al. J Affect Disord 2011;131:344-52

Stability of psychological functioning

		Baseline ICD concerns (n=328)	
		Normal levels (Score 0-12)	*Increased levels (Score • 13)*
12-month ICD concerns	*Normal levels (Score 0-12)*	**63.7% [49.0-81.4]**	21.3% [13.2-32.5]
	Increased levels (Score • 13)	5.8% [2.0-12.8]	**9.1% [4.1-17.2]**

		Baseline anxiety symptoms (n=332)	
		Normal levels (Score 0-7)	*Probable clinical levels (Score • 8)*
12-month anxiety symptoms	*Normal levels (Score 0-7)*	**70.2% [54.7-88.7]**	14.2% [7.7-23.8]
	Probable clinical levels (Score • 8)	5.7% [2.0-12.7]	**9.9% [4.7-18.3]**

		Baseline depressive symptoms (n=332)	
		Normal levels (Score 0-7)	*Probable clinical levels (Score • 8)*
12-month depressive symptoms	*Normal levels (Score 0-7)*	**69.0% [53.6-87.3]**	10.2% [4.9-18.7]
	Probable clinical levels (Score • 8)	8.1% [3.5-15.9]	**12.7% [6.6-21.9]**

- **Majority of patients (i.e., 72% to 81%) preserved pre implantation level of psychological functioning 12 months post implantation**
- **Around 10% to 21% of patients crossed over from high to low levels of distress**
- **Around 5% to 8% changed from low to high levels of distress**

Pedersen, Jordaens, Theuns et al.
Int J Cardiol 2011;In Press

Intra-individual changes in psychological functioning between pre implantation and 12 months stratified by ICD shock*

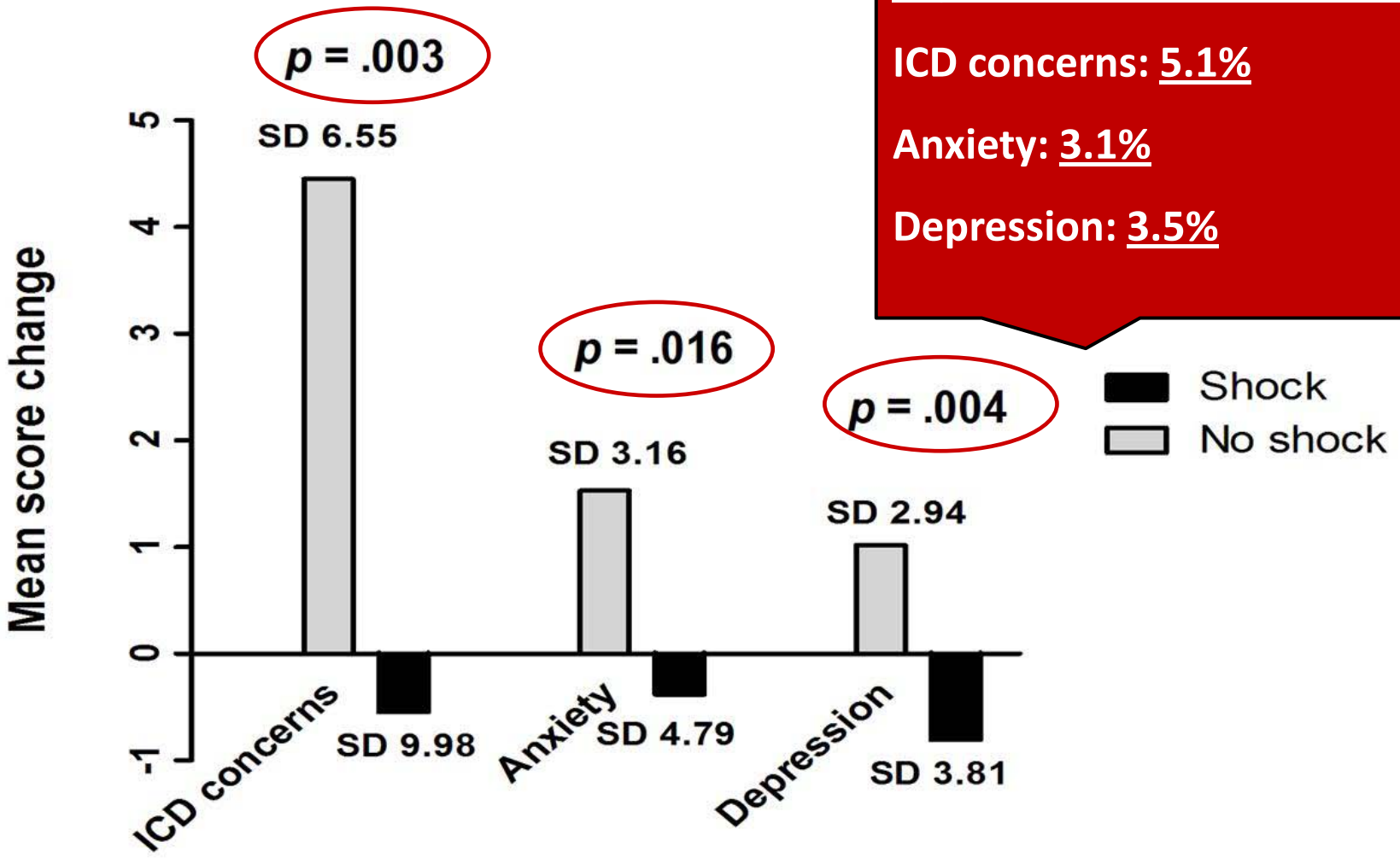
N = 308

Explained variance in changes:

ICD concerns: 5.1%

Anxiety: 3.1%

Depression: 3.5%



** A positive mean score change indicates improvement in psychological functioning*

Pedersen, Jordaens, Theuns et al. Int J Cardiol 2011;In Press

Predictors of mean score changes in psychological functioning during follow-up

Shock: ↑ ICD concerns, Anxiety, Depression
Type D: ↑ ICD concerns, Anxiety, Depression
Primary prevention: ↓ ICD concerns, Anxiety
Older age: ↓ Anxiety
LVEF ≤35%: ↑ Anxiety
AF: ↑ Anxiety
Baseline psych: ↓ ICD concerns, Anxiety, Depression

	ICD concerns								
	β*	[95% CI]							
Male gender	-.01	[-2.02 – 1.56]							
Age	-.04	[-.04 – .09]							
Primary prevention indication	.12	[.20 – 3.73]							
NYHA class III-IV	-.05	[-2.32 – .82]							
LVEF ≤35%	-.09	[-3.93 – .22]	.08	-.1		.007	-.10	[-1.79 – .13]	.09
Atrial fibrillation	.005	[-1.71 – 1.53]	.92	-.12	.14]	.02 #	-.008	[-.81 – .69]	.88
Diabetes mellitus	-.09	[-3.82 – .16]	.07	-.03	1.33 – .68]	.52	-.07	[-1.55 – .27]	.17
Type D personality	-.10	[-3.45 – -.05]	.04 #	-.17	[-2.36 – -.49]	.003 †	-.20	[-2.37 – -.66]	.001 †
Beta-blockers	-.03	[-2.40 – 1.23]	.53	-.005	[-.96 – .87]	.93	.01	[-.76 – .91]	.86
Psychotropic medication	-.03	[-2.38 – 1.42]	.62	-.06	[-1.55 – .38]	.23	.02	[-.71 – 1.04]	.72
Shock during follow-up	-.19	[-6.14 – -1.91]	<.001 ‡	-.16	[-2.75 – -.60]	.002 †	-.18	[-2.63 – -.66]	.001 †
Baseline psychological functioning	.57	[.45 – .64]	<.001 ‡	.54	[.40 – .61]	<.001 ‡	.51	[.30 – .48]	<.001 ‡

Shock viewpoint and counter viewpoint

VIEWPOINTS

Shock as a Determinant of Poor Patient-Centered Outcomes in Implantable Cardioverter Defibrillator Patients: Is There More to It Than Meets the Eye?

SUSANNE S. PEDERSEN, PH.D.,*,† KRISTA C. VAN DEN BROEK, PH.D.,*
MARTHA VAN DEN BERG, M.Sc.,* and DOMINIC A. M. J. THEUNS, PH.D.†
From *CoRPS – Center of Research on Psychology in Somatic diseases, Tilburg University, Tilburg, The Netherlands; and †Department of Cardiology, Thoraxcenter, Erasmus Medical Center, Rotterdam, The Netherl

Given that programming of the ICD is changing, leading to fewer shocks and improved quality of life, it may be timely to also examine the influence of other determinants (e.g. heart failure progression and personality) of patient-reported outcomes...

to be able to draw firm conclusions about the impact of ICD shocks on individual patients. We also need to acknowledge that the impact of shocks on psychological functioning and quality of life may not be as straightforward as previously assumed. Given that programming of the ICD is changing, leading to fewer shocks and improved quality of life, it may be timely to also examine the influence of other determinants (e.g., heart failure progression and the patient's psychological profile) of patient-centered outcomes both in research and in clinical practice. (PACE 2010; 33:1430–1436)

Pedersen et al. Pacing Clin Electrophysiol 2010;33:1430-6

Correlates of anxiety and depression

	Anxiety OR [95% CI]	Depression OR [95% CI]
Female gender	2.38 [1.32-4.29]†	ns
Age	ns	ns
Living with a spouse	ns	ns
Non-ischaemic etiology	ns	ns
Symptomatic CHF	5.15 [3.08-8.63]‡	6.82 [3.77-12.39]‡
Co-morbidity	ns	ns
ICD-related complications	ns	ns
ICD shocks	2.21 [1.32-3.72]†	2.00 [1.06-3.80]*
Years with ICD therapy	ns	ns
Current smoking	ns	ns
Amiodarone	ns	ns
Other antiarrhythmic medication	ns	ns
Psychotropic medication	ns	2.75 [1.40-5.40]†

N = 610

* $P < 0.05$; † $P < 0.01$; ‡ $P < 0.001$

Johansen, Pedersen et al. Europace 2008;10:545-51

Type D (distressed personality)

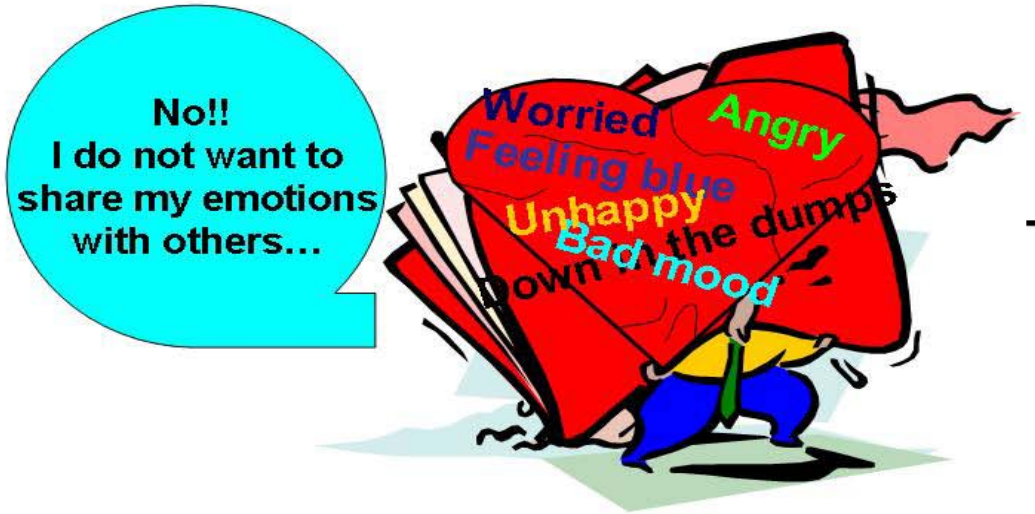
Herzschr Elektrophys 2011 · [jvn]:[afp]–[alp]
DOI 10.1007/s00399-011-0139-9

S.S. Pedersen · A.A. Schiffer

The distressed (Type D) personality. A risk marker for poor health outcomes in ICD patients

Abstract
The distressed (Type D) personality is an emerging risk marker for poor health outcomes in patients with cardiovascular disease. Patients with this personality disposition are typified by a general propensity to experience psychological distress. The contribution focuses on the impact of Type D personality on psychological distress, quality of life, ventricular tachyarrhythmias, and mortality in implantable cardioverter–defibrillator (ICD) patients and examines the relative influence of this vulnerability factor compared to ICD shocks and markers of disease severity in relation to these outcomes.

The burden of increased negative emotions and inhibition



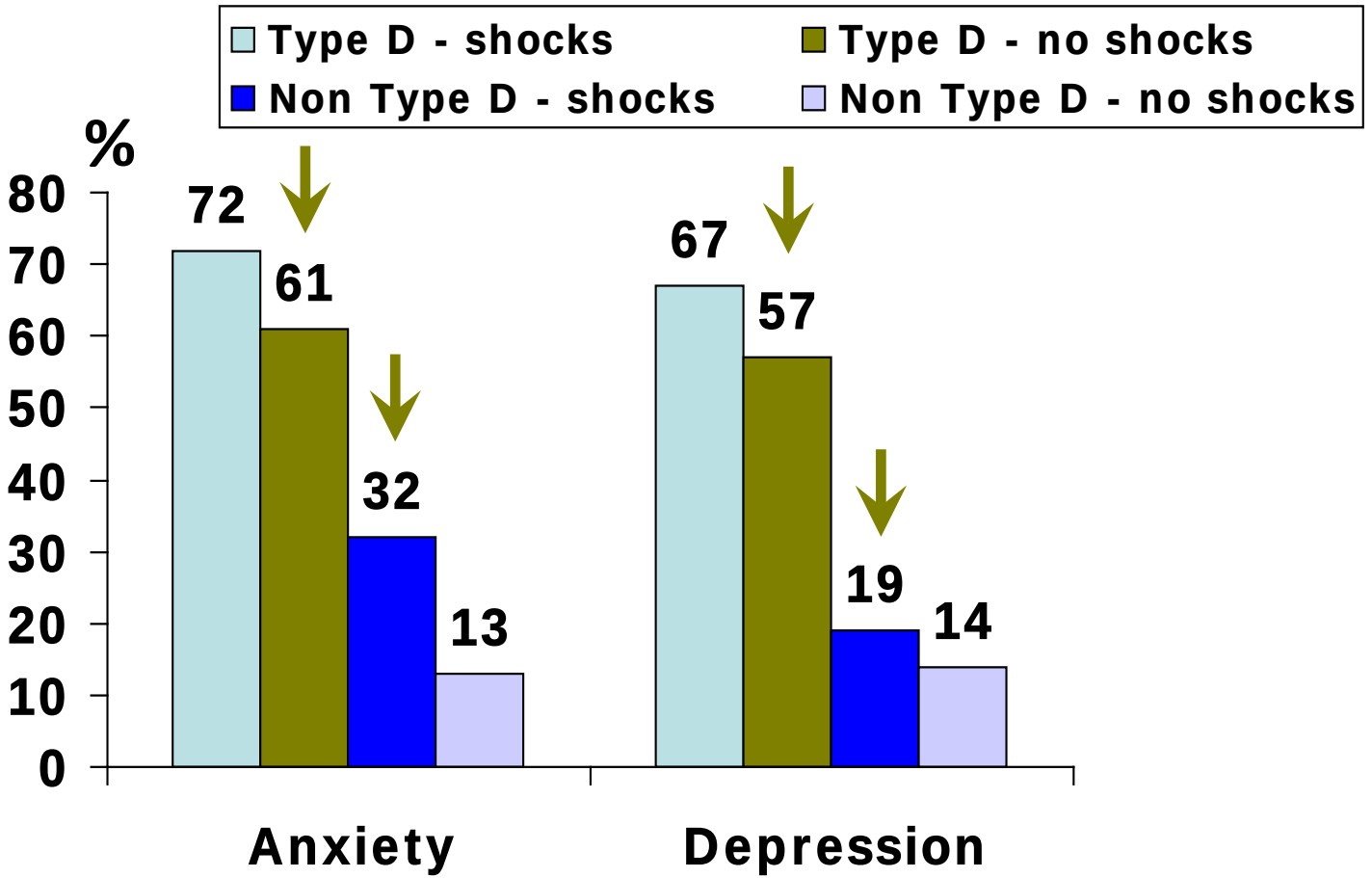
Type D ?

Pedersen & Schiffer. Herzschrittmacherther Elektrophysiol 2011;22:181-8
Denollet et al. Circ Cardiovasc Qual Outcomes 2010;3:546-57

Tilburg University

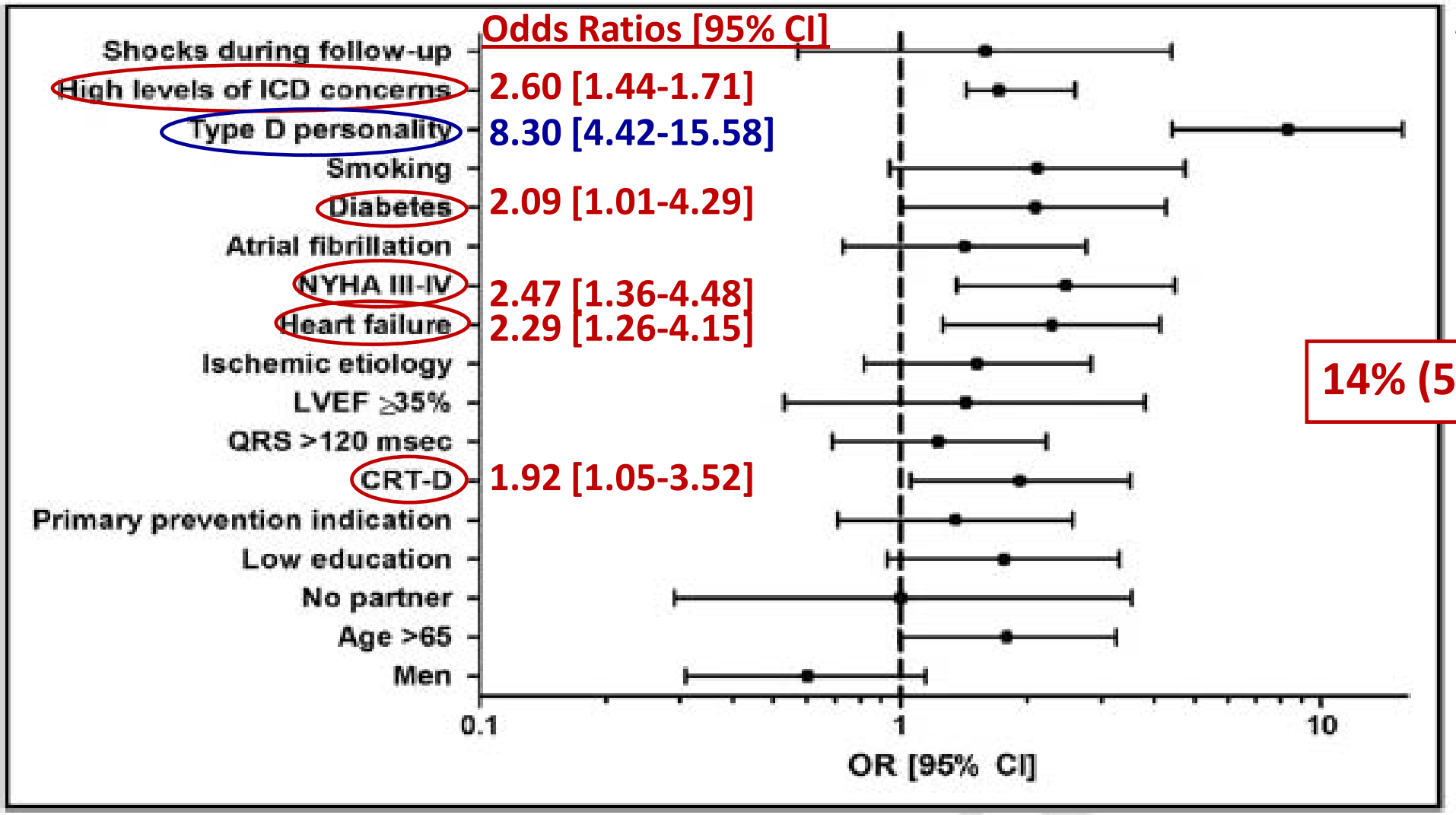
Prevalence of anxiety and depression in patients stratified by Type D and shocks

N = 182



Pedersen, Jordaens, Theuns et al. Psychosom Med 2004;66:714-9

Persistent depression 3 months post implantation



N = 386

14% (52/386)

Pedersen, Jordaens,Theuns et al. Am J Cardiol 2011;108:69-74

Tilburg University

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

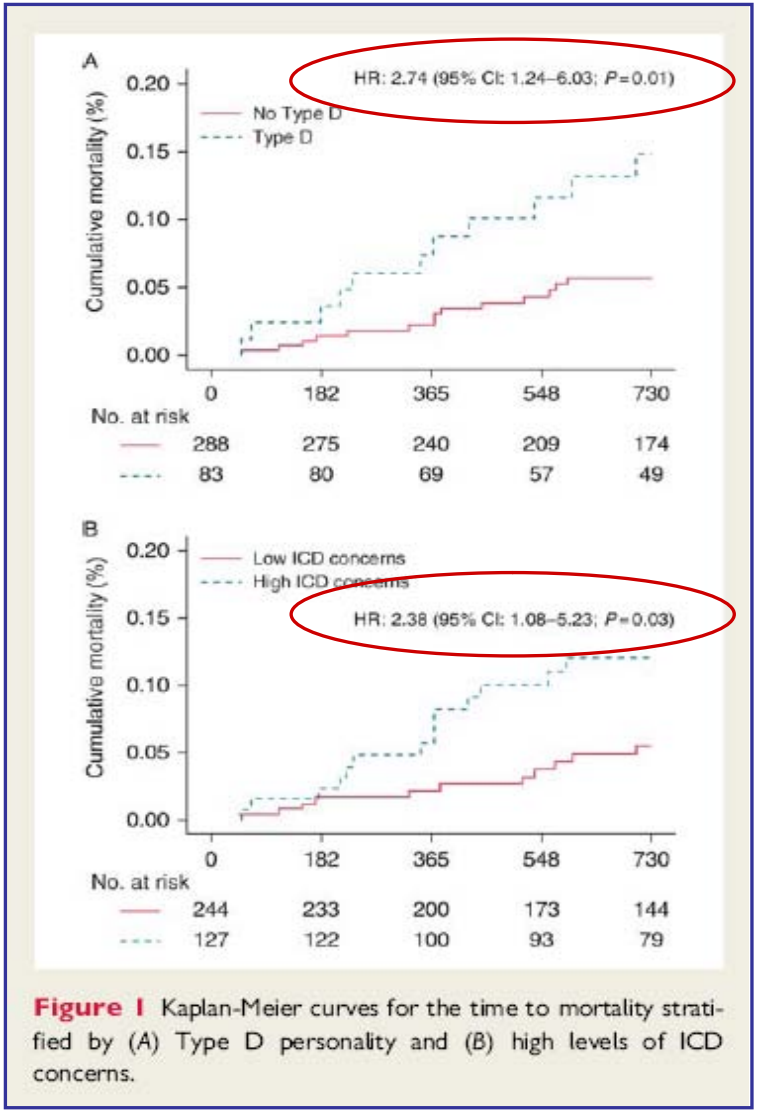
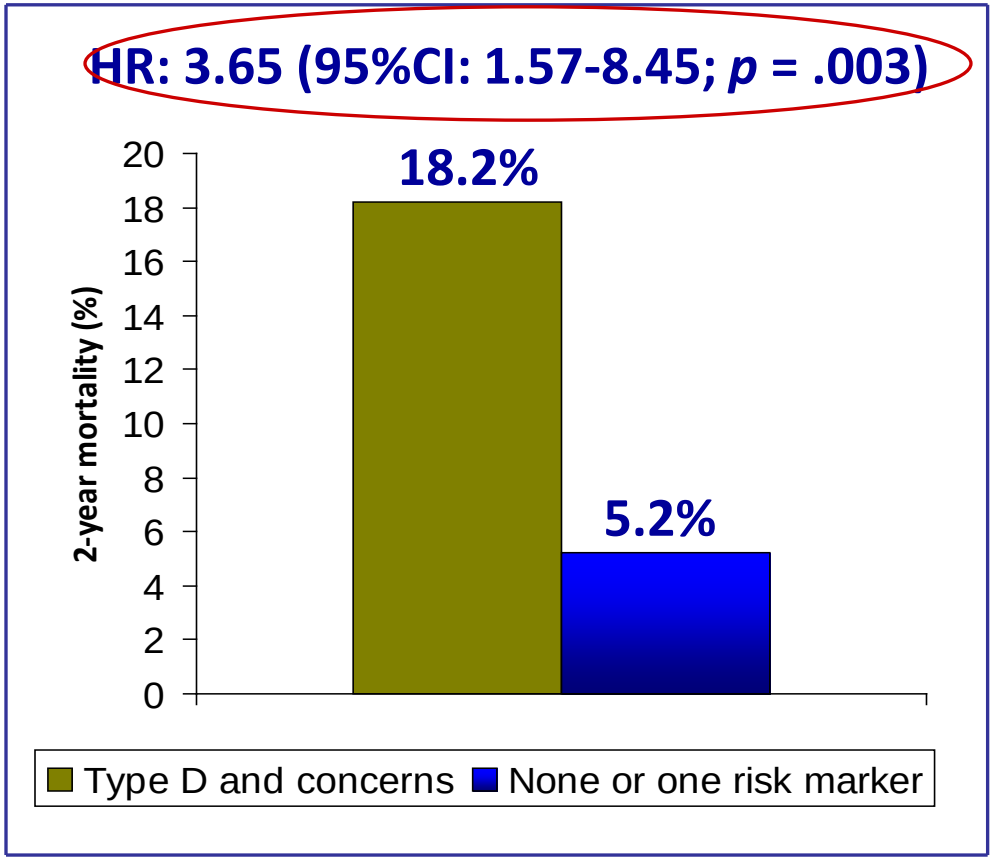


Figure 1 Kaplan-Meier curves for the time to mortality stratified by (*A*) Type D personality and (*B*) high levels of ICD concerns.

N = 371



Pedersen, Erdman et al. Europace 2010;12:1446-52

Tilburg University

EXPERT REVIEWS

Psychological vulnerability, ventricular tachyarrhythmias and mortality in implantable cardioverter defibrillator patients: is there a link?

Expert Rev. Med. Devices 9(4), 377–388 (2012)

Susanne S Pedersen*[1,2], Corline Brouwers[1] and Henneke Versteeg[1]

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Implantable cardioverter defibrillator (ICD) therapy is the first-line treatment for the prevention of sudden cardiac death. Despite the demonstrated survival benefits of the ICD, predicting which patients will die from a ventricular tachyarrhythmia remains a major challenge. So far, psychological factors have not been considered as potential risk markers that might enhance the prediction of sudden cardiac death. This article evaluates the evidence for a link between psychological vulnerability, ventricular tachyarrhythmias and mortality and the pathways that might explain such a link. This review demonstrates that there is cumulative evidence supporting a link between psychological vulnerability and risk of ventricular tachyarrhythmias and mortality in ICD patients independent of disease severity and other biomedical risk factors. It may be premature to include psychological factors in risk algorithms, but information on the psychological profile of the patient may help to optimize the management and care of these patients in clinical practice.

KEYWORDS: arrhythmias • distress • implantable cardioverter defibrillator • mechanisms • mortality • psychological vulnerability

How to break the vicious cycle?

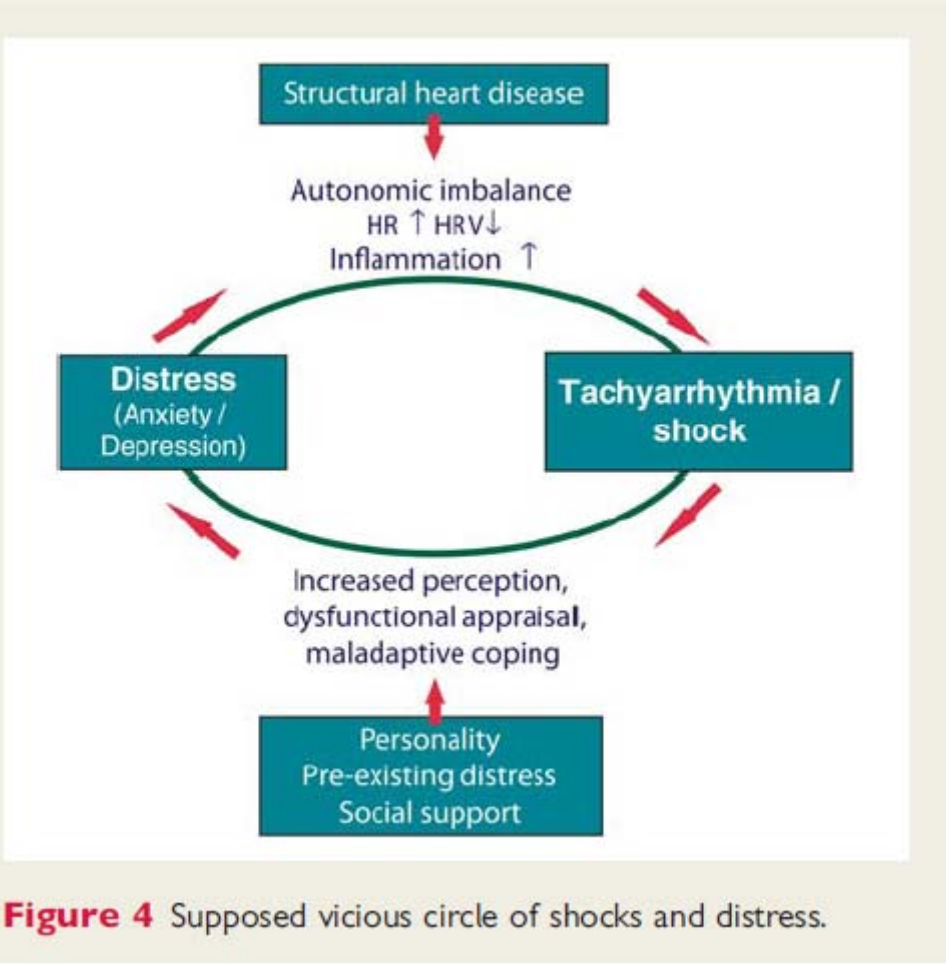

Figure 4 Supposed vicious circle of shocks and distress.

1. Screen and monitor

Europace (2010) 12, 1673–1690
doi:10.1093/europace/euq316

CONSENSUS STATEMENT

Management of patients receiving implantable cardiac defibrillator shocks

Recommendations for acute and long-term patient management

Frieder Braunschweig (Chair)[1]*, Giuseppe Boriani (Co-chair)[2], Alexander Bauer[3], Robert Hatala[4], Christoph Herrmann-Lingen[5], Josef Kautzner[6], Susanne S. Pedersen[7], Steen Pehrson[8], Renato Ricci[9], and Martin J. Schalij[10]

Table 6 Recommended measures to identify high-risk patients post-shock

Risk factor	Questionnaire	Number of items	Minutes for patients to complete	Available in ≥3 languages
ICD concerns	ICDC[a]	8	3–5	Yes
Anxiety	FSAS[a]	10	3–5	Yes
	HADS-A[b]	7	3	Yes
	STAI (state only)[b]	20	3–6	Yes
Depression	HADS-D[b]	7	3	Yes
	PHQ-9[b]	9	3	Yes
Post-traumatic symptoms	IES-R[b]	22	10	Yes
Type D personality	DS14[b]	14	5	Yes

DS14, Type D Scale; FSAS, Florida Shock Anxiety Scale; HADS, Hospital Anxiety and Depression Scale; ICDC, ICD Concerns Questionnaire; IES-R, Impact of Event Scale Revised; PHQ-9, Patient Health Questionnaire; STAI, Spielberger's State-Trait Anxiety Inventory.
[a]Disease-specific.
[b]Generic.

ICD Patient Concerns questionnaire

We want to know what things worry you about living with your ICD. It is important that you answer every question. Don't spend too long thinking about your answers. For each question please circle one number. Please don't leave any out.

0 = Not at all 1 = A little bit 2 = Somewhat 3 = Quite a lot 4 = Very much so

I AM WORRIED ABOUT.....						
1.	My ICD firing	0	1	2	3	4
2.	Doing activities/hobbies that may cause my ICD to fire	0	1	2	3	4
3.	Time spent thinking about my ICD firing	0	1	2	3	4
4.	Working too hard/overdoing things causing my ICD to fire	0	1	2	3	4
5.	Having no warning my ICD will fire	0	1	2	3	4
6.	The symptoms/pain associated with my ICD firing	0	1	2	3	4
7.	Not being able to prevent my ICD from firing	0	1	2	3	4
8.	Getting too stressed in case my ICD fires	0	1	2	3	4

Pedersen, Theuns, Jordaens et al. Am Heart J 2005;149;664-9

2. Psychological and behavioral intervention

Intervention in ICD patients

Effect Sizes for Impact of Intervention Versus Usual Care on Changes in Anxiety

Authors[reference]	Follow-up Period	Effect size* Intervention	Effect size* Usual care	Anxiety Measure
Badger and Morris (1989)[30]	2 months	–	–	–
Carlsson et al. (2002)[22]	1 month	–	–	–
Chevalier et al. (2006)[23]	12 months	0.72	−0.84	HAM-A
Dougherty et al. (2004, 2005)[24, 32]	12 months	0.38	0.15	STAI-S
Fitchet et al. (2003)[25]	6 months	1.79	–	HADS
Frizelle et al. (2004)[26]	3 months	0.34	–	HADS
Kohn et al. (2000)[27]	9 months	0.89	0.30	STAI-S
Molchany and Peterson (1994)[31]	6 months	0.14	0.20	STAI-S
Sneed et al. (1997)[28]	4 months	–	–	POMS

* Based on $mean_1 - mean_2$ / pooled standard deviation.

[1] Pre- and posttreatment scores were not reported separately for the intervention and usual care groups, but only for the total group (i.e. when all patients including the waiting group had undergone the intervention).

HADS = hospital anxiety and depression scale; HAM-A = Hamilton anxiety scale; POMS = profile of mood states; STAI-S = state-trait anxiety inventory (state scale).

Pedersen, van den Broek, & Sears. PACE 2007;30:1546-54

More new studies added...

Authors	N (design)	FU-period	Outcome
Dunbar	246 (RCT)	12 mths	↓ anxiety; ↓ depression; ↓ health care consumption and disability days
Kuhl	30 (RCT)	1 mth	no change in knowledge perception
Lewin	192 (RCT)	6 mths	↓ anxiety; ↓ depression; ↓ admissions; ↑ QoL
Sears	30 (RCT)	4 mths	↓ anxiety; ↓ cortisol ↑depression in 1-day workshop group

BENEFITS

Dunbar et al. PACE 2009;32:1259-71; Kuhl et al. J Cardiovasc Nursing 2009;24:225-31; Lewin et al. Heart 2009;95:63-9; Sears et al. PACE 2007;30:858-64

How to break the vicious cycle?

Cardiac psychology has something to offer to patients

- **Reduce catastrophic thinking**
- **Alleviate** symptoms of **anxiety** and **depression**
- **Improve quality of life**
- **Effect on survival?**

E-health the future?

Erasmus MC
Universitair Medisch Centrum Rotterdam

Amphia Ziekenhuis

CATHARINA-ZIEKENHUIS

Canisius-Wilhelmina Ziekenhuis

olvg onze lieve vrouwe gasthuis

Vlietland Ziekenhuis

Trials

BioMed Central

Study protocol

Open Access

Rationale and design of WEBCARE: A randomized, controlled, web-based behavioral intervention trial in cardioverter-defibrillator patients to reduce anxiety and device concerns and enhance quality of life

Susanne S Pedersen*[1,2], Viola Spek[1], Dominic AMJ Theuns[2], Marco Alings[3], Pepijn van der Voort[4], Luc Jordaens[2], Pim Cuijpers[5], Johan Denollet[1] and Krista C van den Broek[1]

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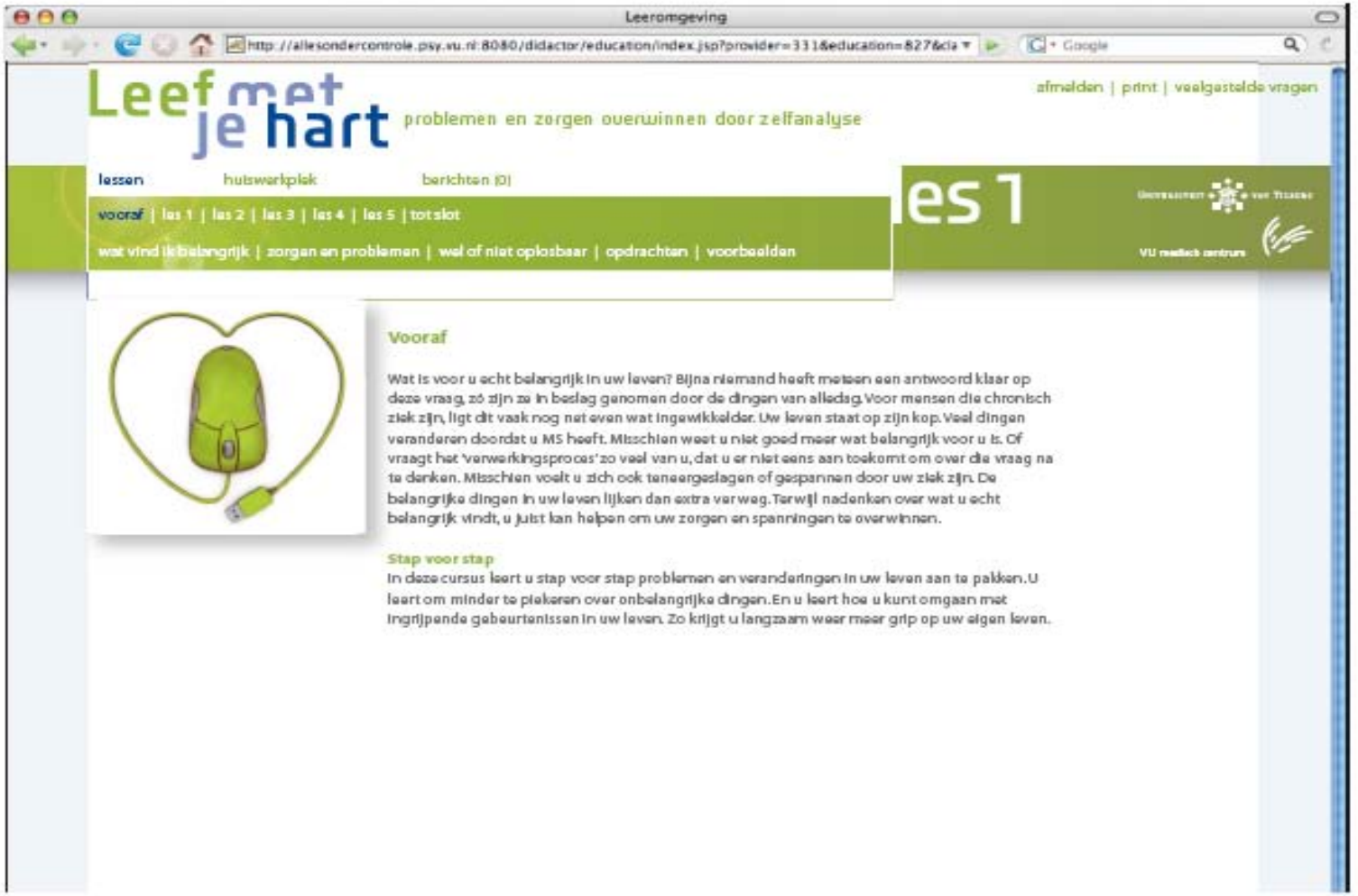
This article is available from: http://www.trialsjournal.com/content/10/1/120

Intervention – web application



Intervention (fixed, 3-month duration)

COMPONENTS

- Psycho-education about the ICD
- Problem-solving skills
- Cognitive restructuring
- Relaxation training
- Personalized feedback by a therapist via the computer

TOPICS DEALT WITH

- Emotional reactions to ICD therapy
- Which aspects of ICD therapy may lead to distress
- How to deal with shocks
- Disease-specific issues and fears
- How to prevent the avoidance of activities
- Interpretation of bodily symptoms
- How to cope with uncertainty
- Help-seeking behavior
- How to cope with stress

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doi:10.1093/europace/euq316

CONSENSUS STATEMENT

Management of patients receiving implantable cardiac defibrillator shock

Recommendations for acute and long-term patient management

Tips how to reduce distress post-shock...

Frieder B[illegible]g (Chair)[1*], Giuseppe Boriani (Co-chair)[2], Alexander Bauer[3], Robert Hat[illegible], Christoph Herrmann-Lingen[5], Josef Kautzner[6], Susanne S. Pedersen[7], Steen Pehrson[8], Renato Ricci[9], and Martin J. Schalij[10]

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