



Jydske Medicinske Selskab  
Overdiagnosticering og overbehandling i sundhedsvæsenet

## Mind the gap: Behandling med Implanterbar Cardioverter Defibrillator (ICD)

14. November 2015

Christian Gerdes  
Sektionsleder Arytmi, Hjertesygdomme, AUH Skejby  
Formand for Dansk Cardiologisk Selskab



Primum non nocere



# Prioritering...





# Læger og prioritering

- Faglighed
- Rationering
- Prioritering
  - Tilvalg
  - Fravalg
- Etisk Råd's arbejdsgruppe vedr. prioritering ( UfL 2013; 175/41: 2444-5)

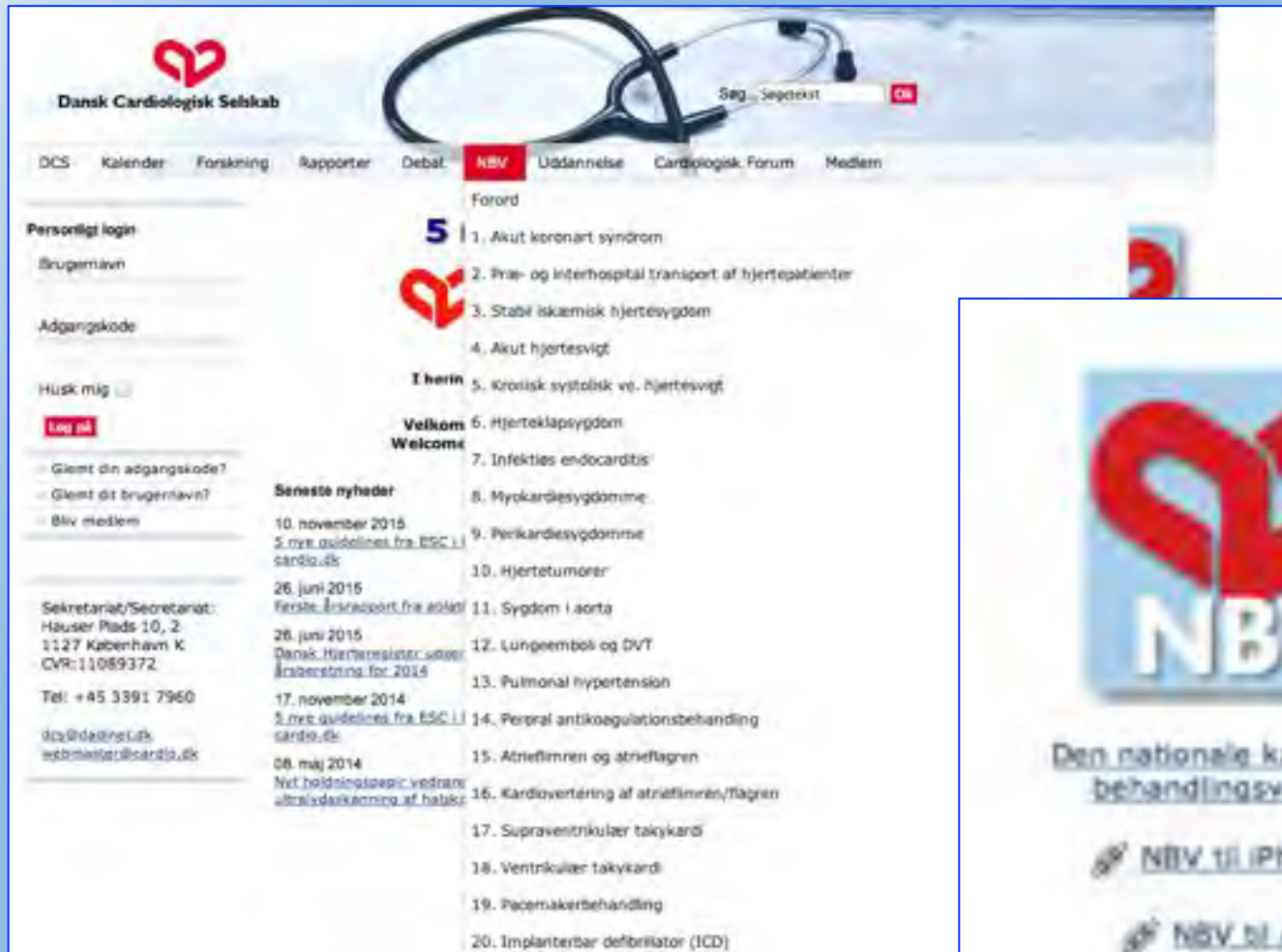


# Kardiologer



...er stolte over at at have  
Verdens (næst) bedste arbejde

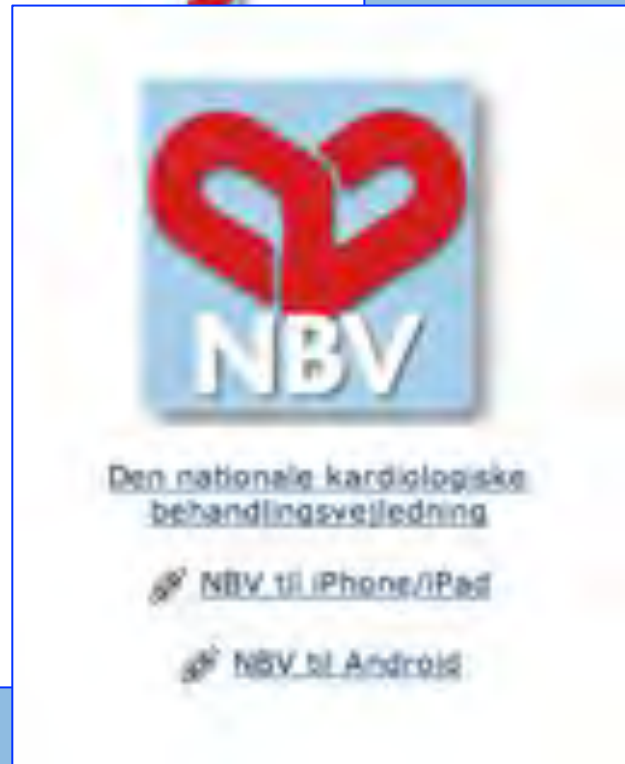
# Og over guidelines og NBV



The screenshot shows the website of the Dansk Cardiologisk Selskab (Danish Cardiological Society). The main navigation bar includes links for DCS, Kalender, Forskning, Rapporter, Debat, NBV, Uddannelse, Cardiologisk Forum, and Medlem. The NBV section is highlighted in red and contains a list of 20 topics:

1. Akut koronært syndrom
2. Pra- og interhospital transport af hjertepatienter
3. Stabilt iskæmisk hjertesygdom
4. Akut hjertesvigt
5. Kronisk systolisk ve. hjertesvigt
6. Hjerteklapsygdom
7. Infekties endocarditis
8. Myokardiesygdomme
9. Perikardiesygdomme
10. Hjertetumorer
11. Sygdom i aorta
12. Lungeemboli og DVT
13. Pulmonal hypertension
14. Perifer antikoagulationsbehandling
15. Atrieflimren og atrieflagnen
16. Kardiovertering af atrieflimren/flagnen
17. Supraventrikulær takykardi
18. Ventrikulær takykardi
19. Pacemakerbehandling
20. Implanterbar defibrillator (ICD)

Additional elements on the page include a search bar, a login section, and a list of recent news items.



The image shows the NBV logo, which consists of a red heart shape with the letters 'NBV' in white below it. Below the logo, the text reads: "Den nationale kardiologiske behandlingsvejledning". At the bottom, there are two icons: an Apple logo with the text "NBV til iPhone/iPad" and an Android logo with the text "NBV til Android".

# Kriterier for guidelines

**Table 1** Classes of recommendations

Classes of recommendations	Definition	Suggested wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended/is indicated
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
Class IIa	<i>Weight of evidence/opinion is in favour of usefulness/efficacy.</i>	Should be considered
Class IIb	<i>Usefulness/efficacy is less well established by evidence/opinion.</i>	May be considered
Class III	Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended



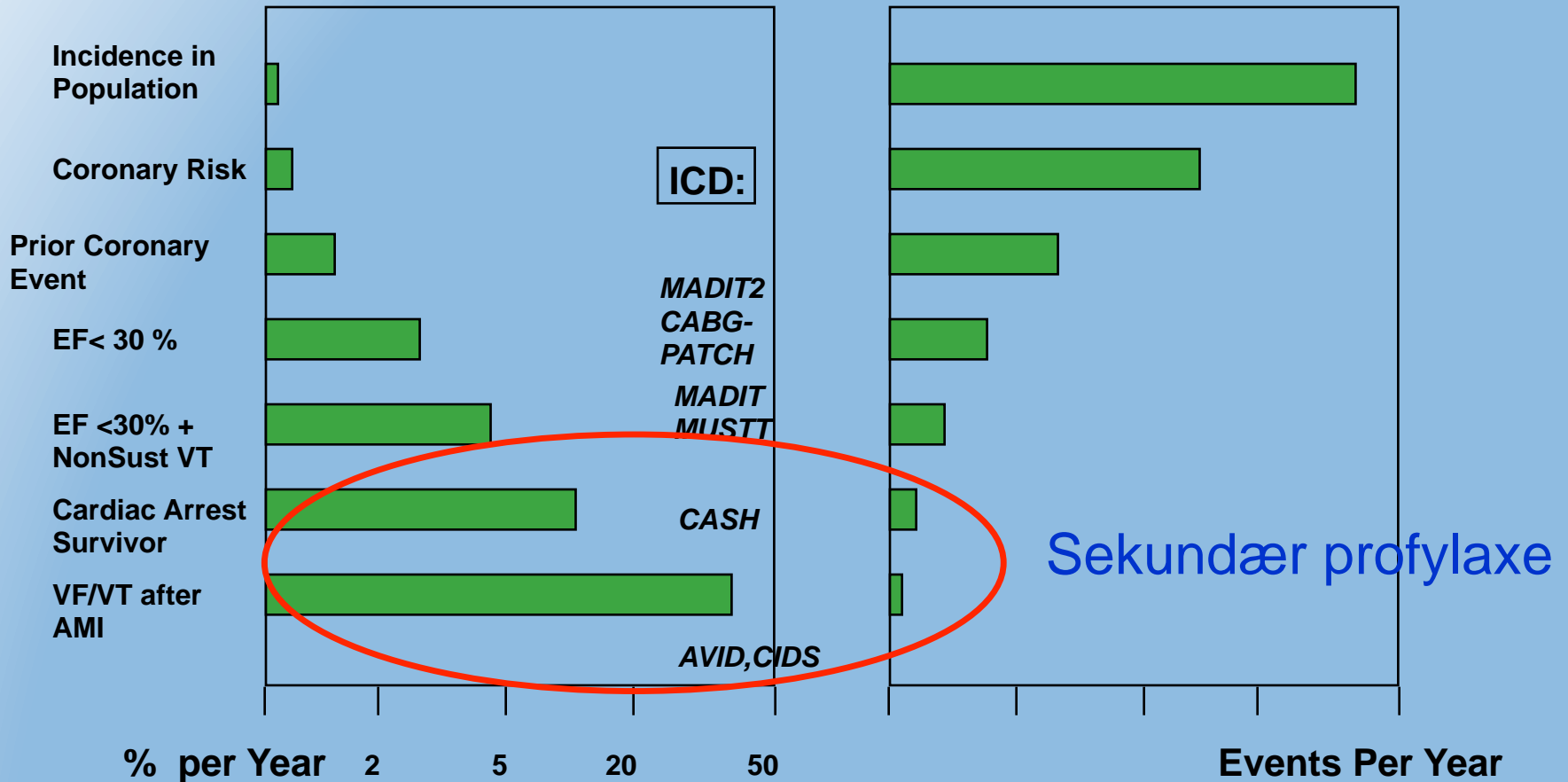
# Dilemmaer

- Guidelines
  - Evidens giver en god fornemmelse
  - Men giver også begrænsninger i form af cerebral tomgang
- Det kræver klinisk mod af fravige guidelines
  - Og medfører mere arbejde end at følge dem
  - Systemet indretter sig på guidelines (pølsefabrikken)
- Guidelines og Catch 22
  - Key opinion leaders
  - Conflicts of interest





# Sudden Death: Incidence and Total Events

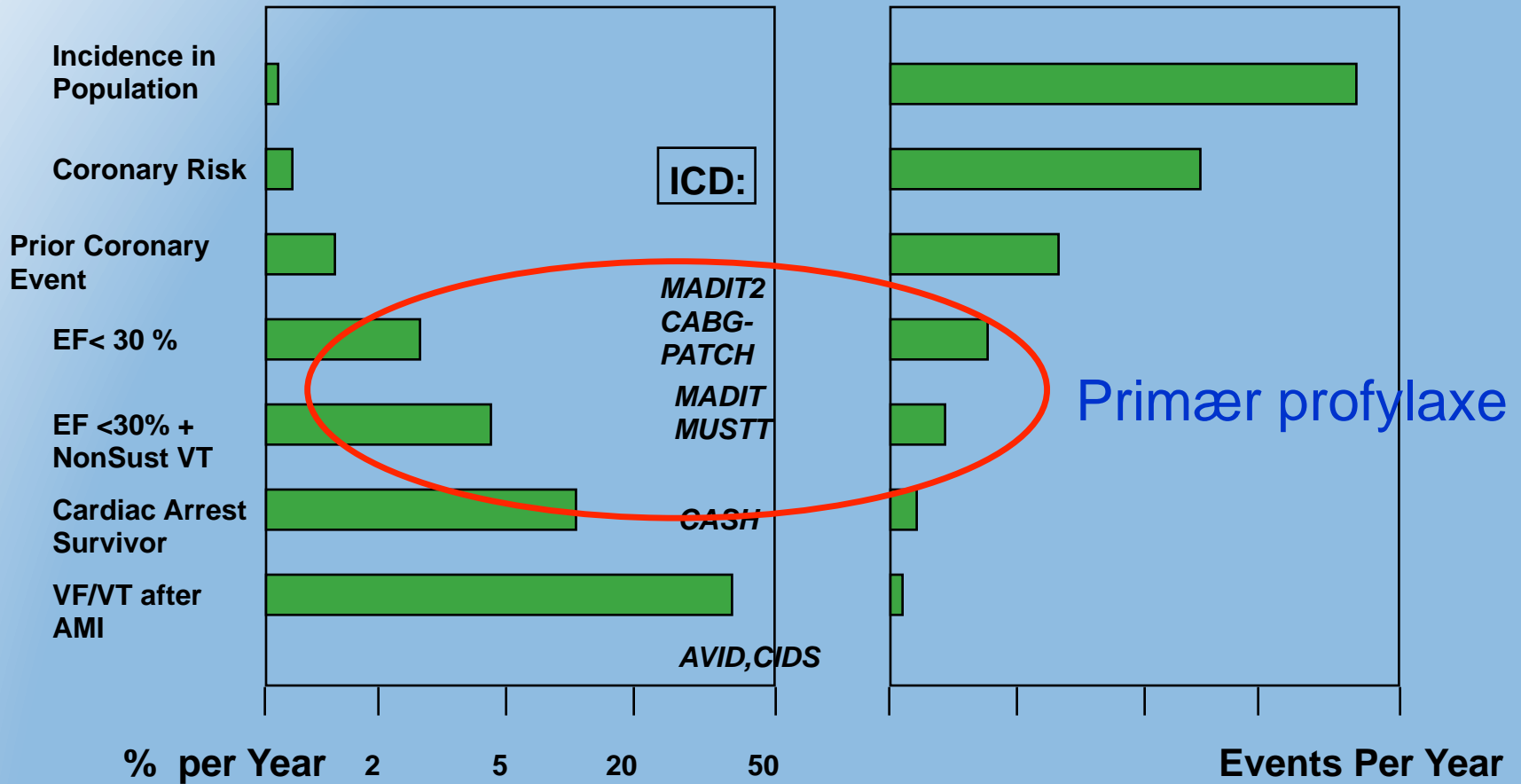


Sekundær profylaxe

**CLINICAL TRIALS**



# Sudden Death: Incidence and Total Events



**CLINICAL TRIALS**



# ICD





# ICD

- Implanterbar cardioverter defibrillator
- Automatisk detektion og behandling af ventrikulære takyarytmier 1980 Baltimore USA
- 1989 Danmark
- Implantation af ca. 1300 per år i DK, faldende
- Ca halvdelen er primær profylaktiske
- Cirka 7000 ICD-patienter i DK, stigende

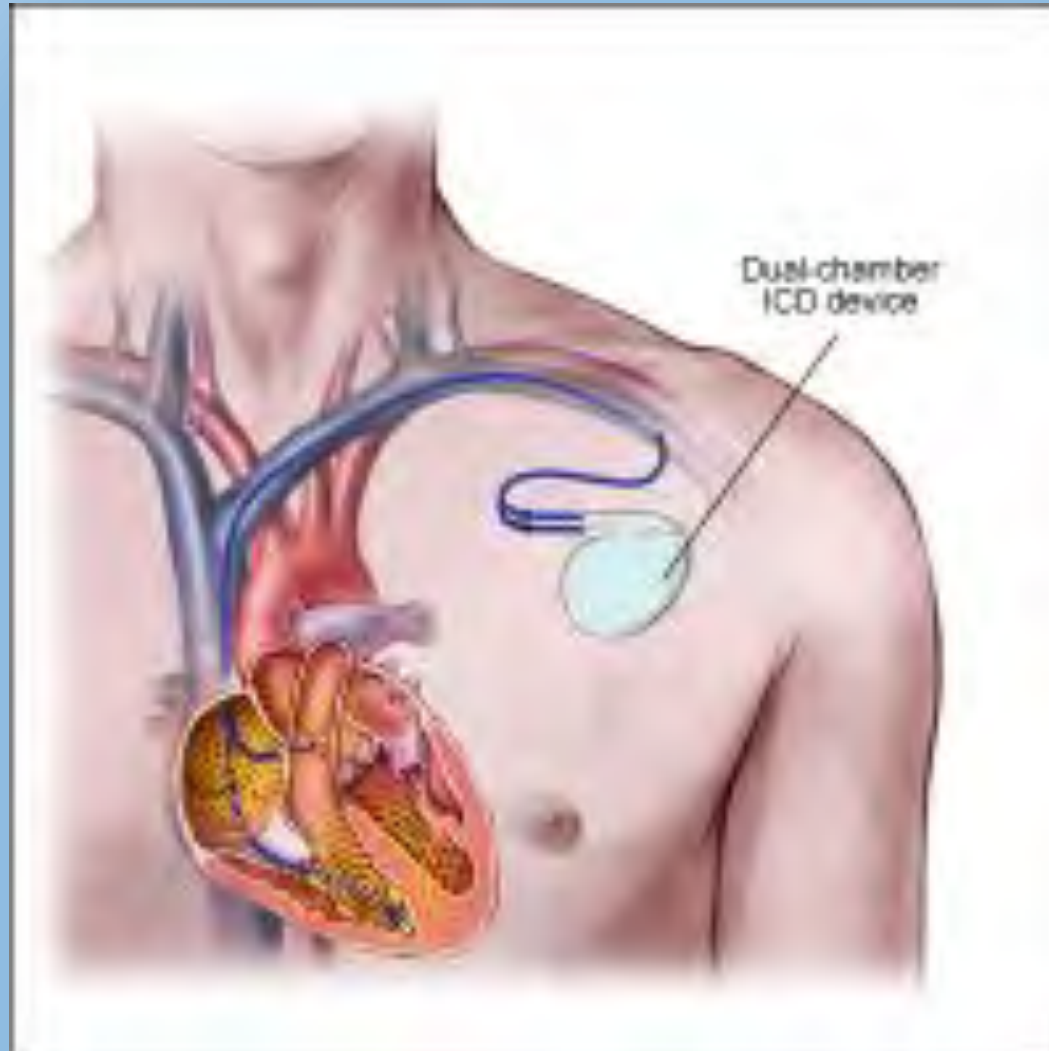


## ICD

- Implanteres i lokalanalgesi
- Testes intraoperativt i tung sedering
- Ses ambulant efter 1 måned
- Herefter hver 6. måned (hjemmemonitorering)
- Før ved stød
- 24 timers service

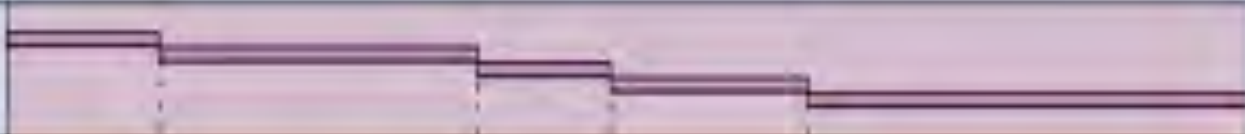


# ICD



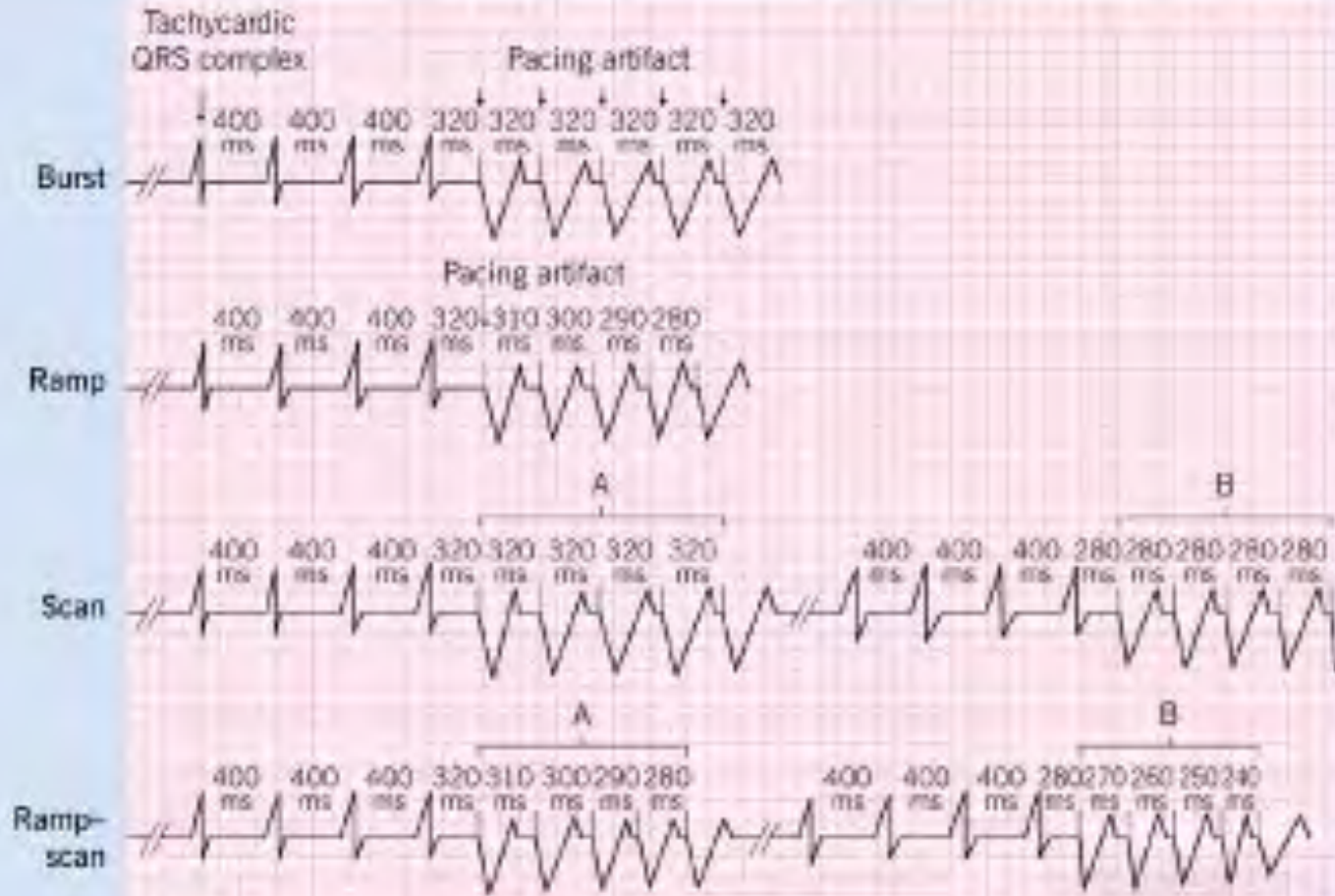
# ICD

## HIERARCHIC APPROACH OF TIERED THERAPY

					
Rate (bpm)	50		145	165	200
Zone	Brady-cardia	'Normal' rhythm	VT 1	VT 2	VF
Therapy	Pacing	None	ATP 1	ATP 1 ATP 2 DC 'low' DC 'high'	DC 'high'

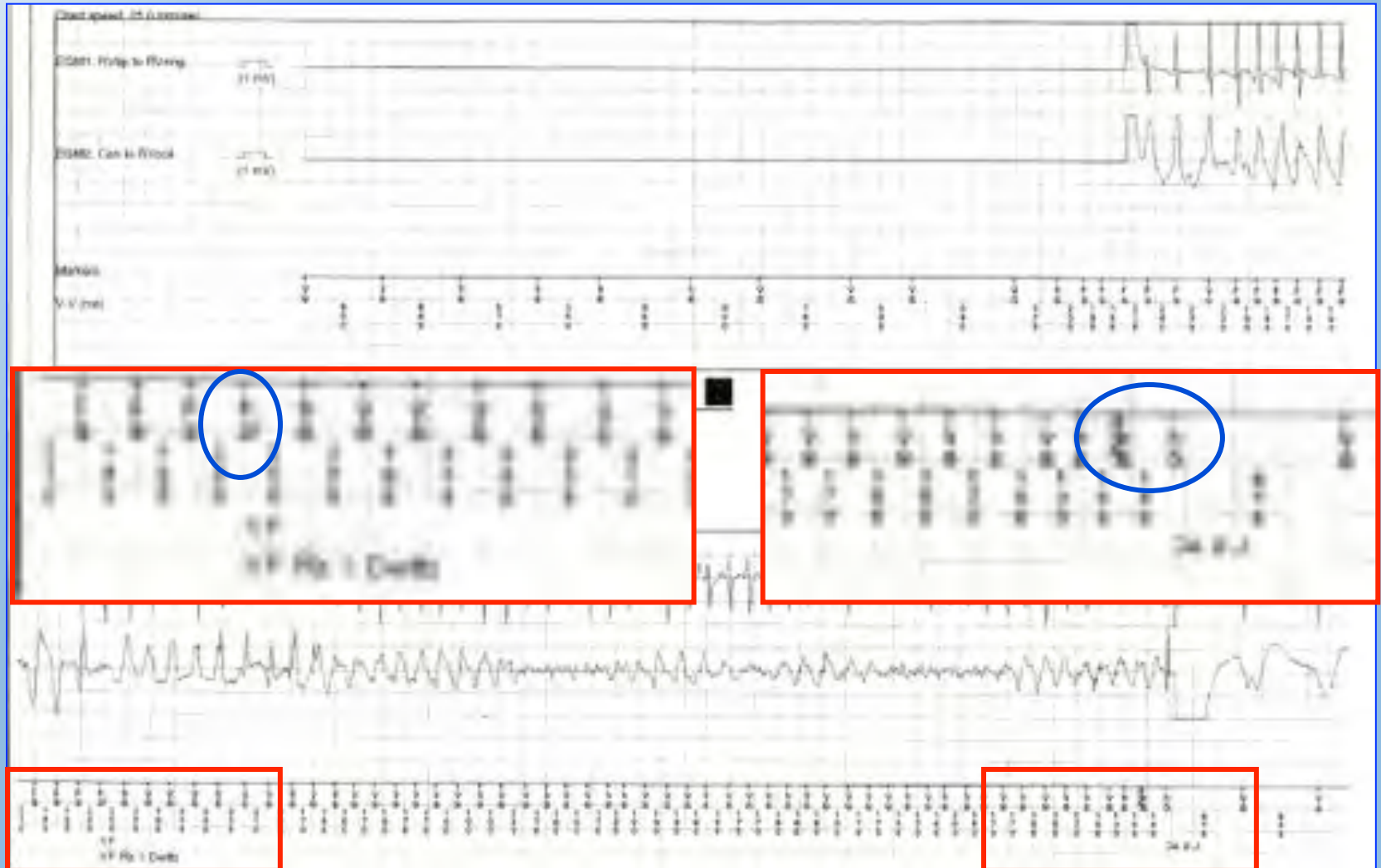
# ICD

## ANTITACHYCARDIA PACING TECHNIQUES

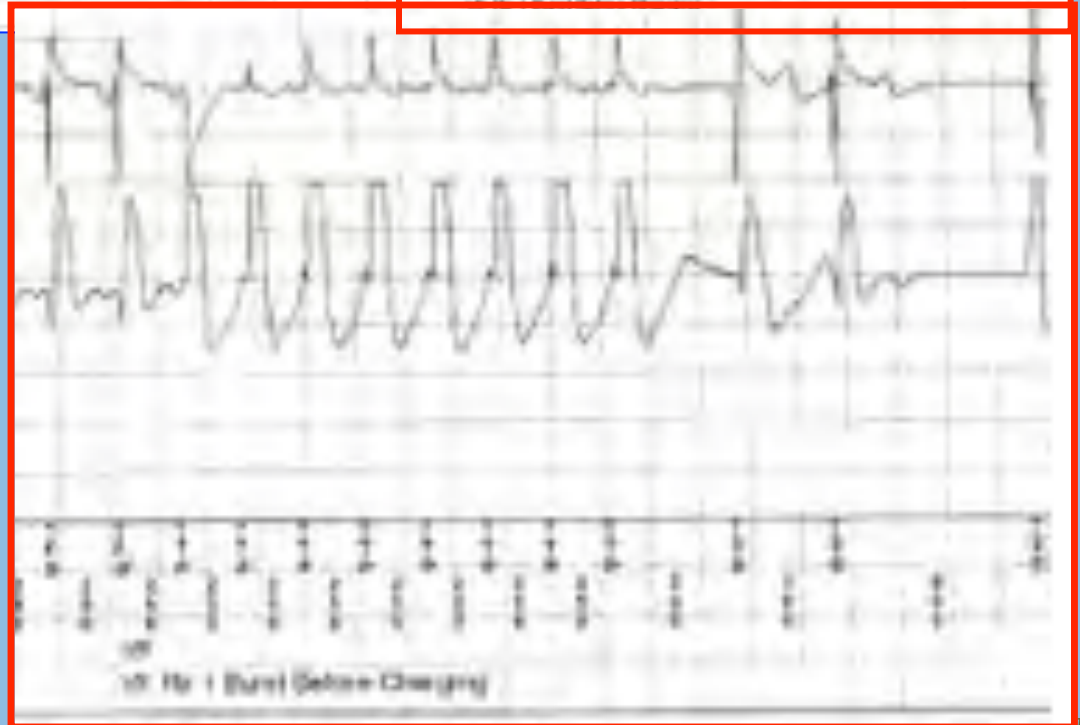
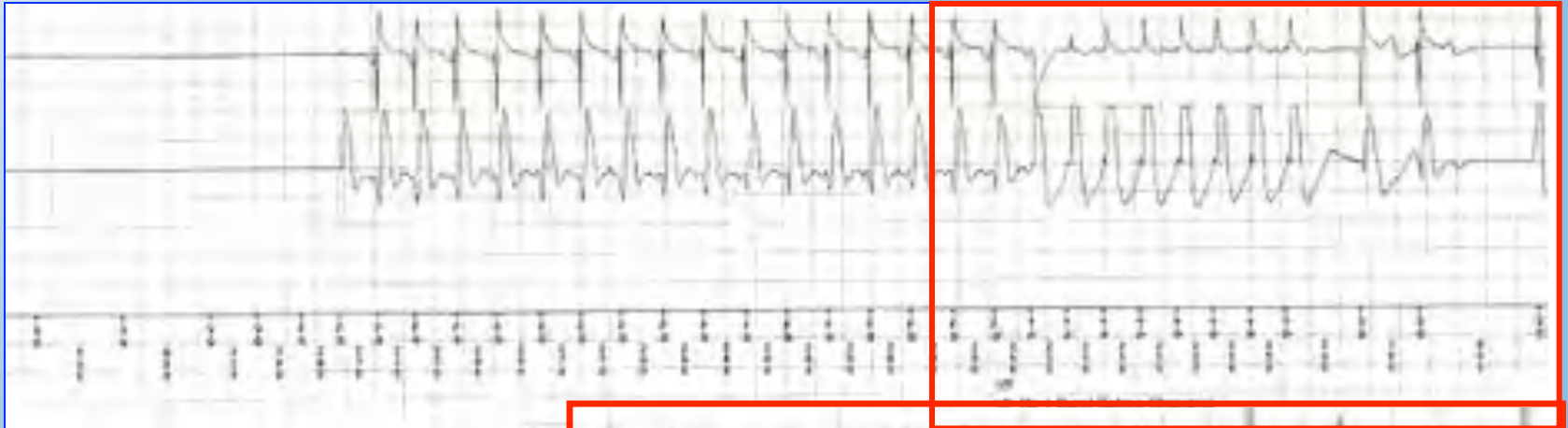




# ICD-exempel



# ICD-exempel





## Ulemper ved ICD-behandling

- Peroperative komplikationer
- Infektion
  - Primærimplantation
  - Skift
- Inappropriate shock
  - Tekniske fejl
  - SVT, oftest atrieflimren
- Psykologiske

# Hvad siger NBV ?

## 20.2 INDIKATIONER FOR ICD BEHANDLING

*Sekundær profylaktisk implantation anbefales til*

- Patienter med ventrikelflimren (VF) eller hæmodynamisk betydende ventrikulær takykardi (VT) (spontan eller induceret ved invasiv elektrofysiologisk undersøgelse).
- Patienter, som har overlevet hjertestop, synkope eller andre alvorlige arytmisymptomer, hvor årsagen til arytmie (VT/VF) ikke er reversibel (proarytmi, intoksikation, elektrolytforstyrrelser), forbigående (AMI i den tidlige fase) eller til at behandle på anden måde (radiofrekvensablation).

*Primær profylaktisk implantation anbefales til patienter med*

- IHS.
- EF  $\leq$  35%.
- NYHA klasse II eller III trods optimal medicinsk behandling.

Der anbefales en latentid på 90 dage efter AMI og CABG samt en individuel vurdering efter PCI.

Hos patienter med hjertesvigt på ikke-iskæmisk baggrund og EF  $<$  35%, NYHA klasse II eller III trods optimal medicinsk behandling samt forventet levetid på mere end 1 år pågår et afklarende nationalt studie (DANISH).

Med hensyn til indikation for biventrikulær-ICD (CRT-D) henvises i øvrigt til Kapitel 19: Pacemakerbehandling, afsnit 19.6

*Primær profylaktisk implantation bør desuden overvejes ved*

- Langt QT-syndrom.
- Arytmogen højre ventrikulær cardiomypati (ARVC).
- Andre arvelige tilstande med livstruende ventrikulære takyarytmier hvor familiekonsekvensen tyder på høj risiko for pludselig død.
- Patienter der afventer hjertetransplantation, hvor der skønnes at være høj risiko for pludselig død i ventetiden (»bridge to transplantation«).

Behandling med ICD skal ikke tilbydes patienter med forventet begrænset restlevetid ( $<$  12 måneder).



## Hvad siger NBV ?

- Intet alderskriterium
- 2015 tilføjet overvejelser vedr udskiftning, nedgradering etc (før endorsement af ESC guidelines)
- 2015 tilføjet oplysninger om komplikationer
  - Mhp bedre information til patienterne



# ICD og CRT i DK 2015

- Ca 25 % er udskriftninger
- Gennemsnitsalder 70 år

# ICD i DK -1



Europace (2013) 15, 1150–1157  
doi:10.1093/europace/eut017

**CLINICAL RESEARCH**

*Sudden death and ICDs*

## **Mortality and appropriate and inappropriate therapy in patients with ischaemic heart disease and implanted cardioverter-defibrillators for primary prevention: data from the Danish ICD Register**

**Peter Weeke<sup>1,2\*</sup>, Jens Brock Johansen<sup>3,4</sup>, Ole Dan Jørgensen<sup>3,5</sup>, Jens Cosedis Nielsen<sup>6</sup>, Mogens Møller<sup>4</sup>, Regitze Videbæk<sup>7</sup>, Michael Vinther Højgaard<sup>1</sup>, Sam Riahi<sup>8</sup>, and Peter Karl Jacobsen<sup>7</sup>**

1609 patienter  
2007-2011

## Conclusion

In this nationwide study of 'real-world' IHD patients with left ventricular dysfunction and a primary preventive ICD, we identified low appropriate shock rates (7.8%) compared to previous clinical trials. This means, only a minority of such patients will benefit from their ICD. Inappropriate shock and inappropriate therapy (shock or ATP) rates were also low (2.6 and 3.7%, respectively). Considering the low rate of both shocks and ATP, our findings could suggest a shift in the risk profile from arrhythmia events towards other causes of death in patients with IHD receiving an ICD for primary prevention of SCD. Such changes may disturb the balance between risk and benefit in the individual patient considered for ICD implantation in the future. The study demonstrates how 'real-world' data are important in order to evaluate the safety and efficacy of guideline recommended treatment.



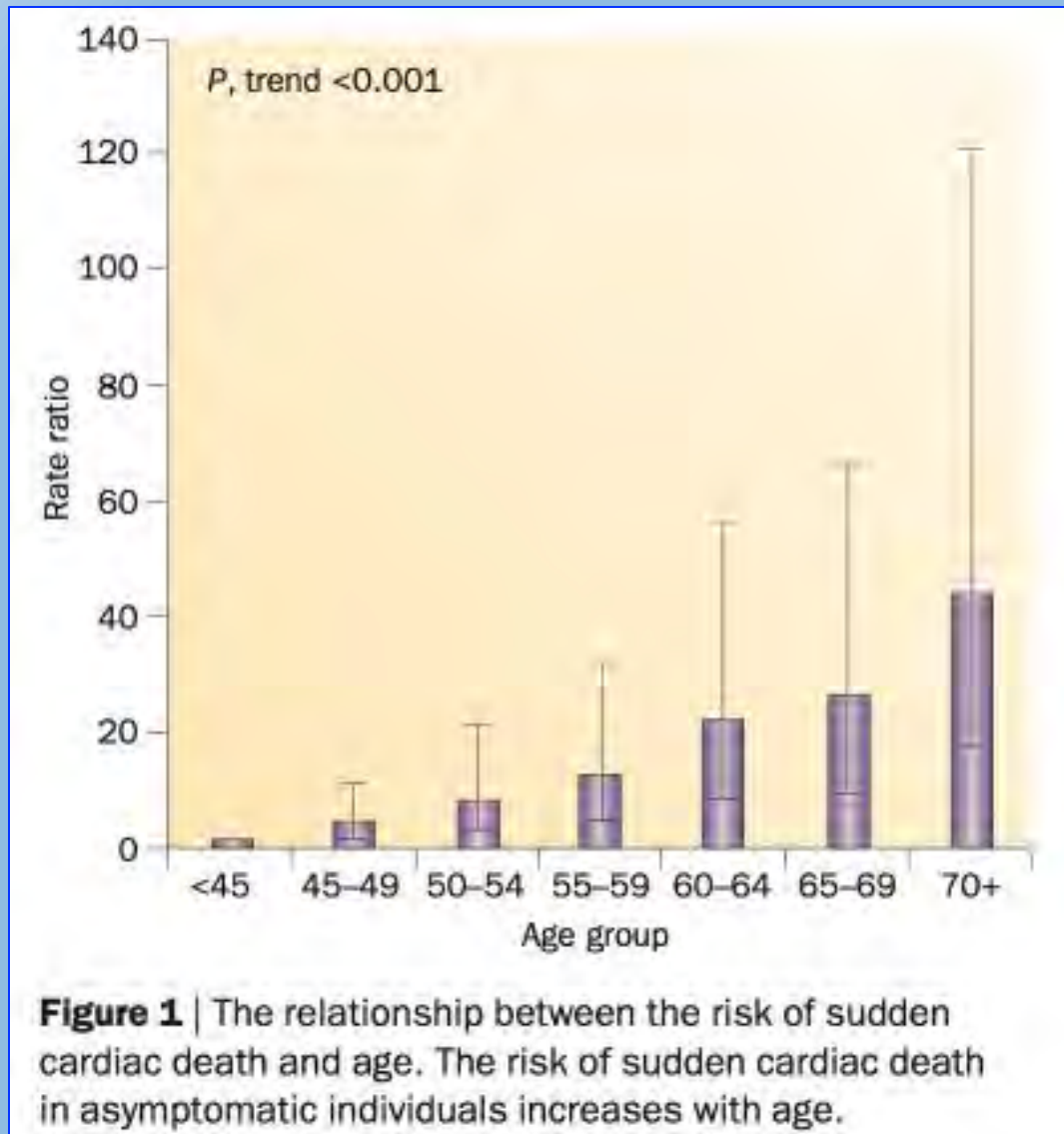


# ICD og ældre

## Causes and prevention of sudden cardiac death in the elderly

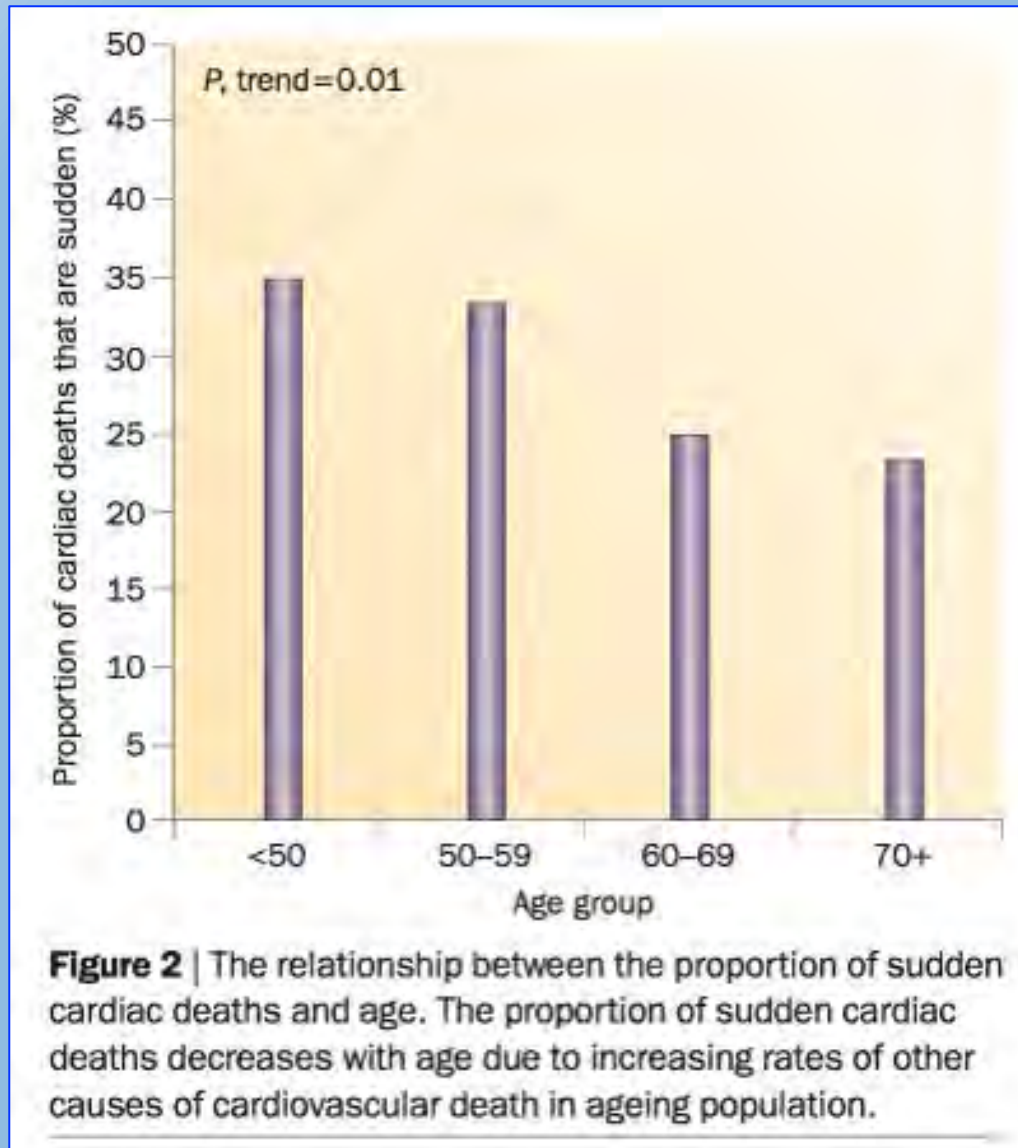
Tung, P. & Albert, C. M. *Nat. Rev. Cardiol.* **10**, 135–142; published online 29 January 2013

# ICD og ældre



Tung, P. & Albert, C. M. *Nat. Rev. Cardiol.* **10**, 135–142; published online 29 January 2013

# ICD og ældre



Tung, P. & Albert, C. M. *Nat. Rev. Cardiol.* **10**, 135–142; published online 29 January 2013

# ICD og ældre

**Table 1** | Randomized trials of the effect of ICD on all-cause mortality in elderly and young patients\*

Study name	Mean age (years)	Total number of patients	Number of elderly patients (age range in years)	Study population	Average follow-up (months)	HR <sup>†</sup> among the elderly (95% CI)	HR <sup>‡</sup> among the young (95% CI)
<i>Trials testing effect of ICD use in commonly encountered primary prevention populations<sup>§</sup></i>							
MADIT-II	64 ± 10	1,232	862 (>60)	Ischaemic cardiomyopathy, LVEF ≤30%	20	0.69 (0.52–0.92)	0.49 (0.24–0.92)
SCD-HeFT	60 (52–69 IQR)	2,521	578 (>65)	Ischaemic or dilated cardiomyopathy, LVEF ≤35%	46	0.86 (0.62–1.18)	0.68 (0.50–0.93)
DEFINITE	58 (range 20–84)	458	157 (>65)	Dilated cardiomyopathy, LVEF ≤36%, NSVT	29	0.60 (0.31–1.21)	0.67 (0.34–1.38)
<i>Trials testing effect of ICD use early after acute myocardial infarction<sup>  </sup></i>							
DINAMIT	62 ± 11	674	399 (>60)	Ischaemic cardiomyopathy, LVEF ≤35%, impaired cardiac autonomic function	30	1.29 (0.85–1.87)	0.81 (0.38–1.88)
IRIS	62 ± 11	898	418 (>65)	LVEF ≤40%, increased heart rate or NSVT within 31 days of acute myocardial infarction	37	1.07 (0.81–1.52)	0.96 (0.64–1.58)

\*Table only includes information from trials reporting outcome data by age subgroup; as reported by Strangelli et al.<sup>74</sup>. <sup>†</sup>Compared with standard medical therapy. <sup>‡</sup>Pooled HR in the elderly 0.75, 95% CI 0.61–0.91, P=0.004; pooled HR in the young 0.65, 95% CI 0.50–0.83, P<0.001. <sup>§</sup>Pooled HR in the elderly 0.89, 95% CI 0.70–1.15, P=0.38; pooled HR in the young 0.72, 95% CI 0.58–0.89, P=0.003. Abbreviations: DEFINITE, the Defibrillators in Non-Ischemic Cardiomyopathy Treatment Evaluation Trial; DINAMIT, the Defibrillator in Acute Myocardial Infarction Trial; HR, hazard ratio; IQR, interquartile range; IRIS, the Immediate Risk Stratification Improves Survival Trial; LVEF, left ventricular ejection fraction; MADIT-II, the Multicenter Automatic Defibrillator Implantation Trial II; NSVT, nonsustained ventricular tachycardia; SCD-HeFT, the Sudden Cardiac Death in Heart Failure Trial.



## ICD og ældre

- Mindre effekt af ICD-behandling med stigende alder
- Afhængigt af cut-off for "ældre"
- Landmark studierne inkluderede få "ældre" patienter

# Evidens ? -1

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© 2008 by the American College of Cardiology Foundation  
Published by Elsevier Inc.

Vol. 51, No. 3, 2008  
ISSN 0735-1097/08/\$34.00  
doi:10.1016/j.jacc.2007.08.058

## **Risk Stratification for Primary Implantation of a Cardioverter-Defibrillator in Patients With Ischemic Left Ventricular Dysfunction**

Ilan Goldenberg, MD,\* Anant K. Vyas, MD, MPH,† W. Jackson Hall, PhD,‡ Arthur J. Moss, MD,\*  
Hongyue Wang, PhD,‡ Hua He, MA,‡ Wojciech Zareba, MD, PhD,\* Scott McNitt, MS,\*  
Mark L. Andrews, BBA,\* for the MADIT-II Investigators

MADIT-II: IHS, EF < 30 %, ICD vs konv. Terapi, 1232 ptt

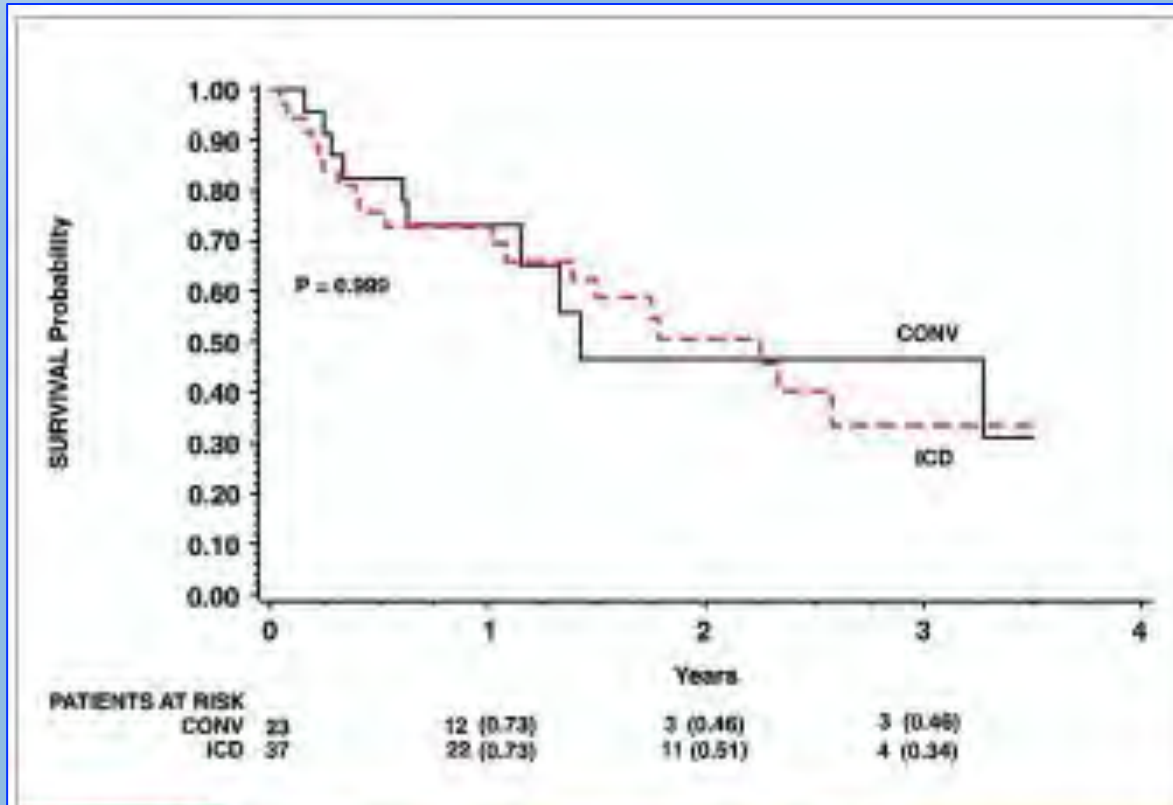
# Evidens ? -2

**Table 1**

**Baseline Characteristics, and Mortality, of the Total Study Population, by Very High-Risk Patients (VHR Group)\* Versus All Other Study (Non-VHR) Patients**

	VHR Patients (n = 60)	Non-VHR Patients (n = 1,172)
<b>Characteristic</b>		
BUN, mg/dl	58 (54, 66)	29 (26, 15)†
Creatinine, mg/dl	2.3 (2.6, 1.9)	1.1 (1.3, 0.96)†
Age, yrs	72 (77.5, 66)	65 (72, 57)†
Ejection fraction	20 (25, 17)	25 (28, 20)†
NYHA (% in I, II, III-IV)‡	23%, 23%, 53%	37%, 36%, 24%†
QRS duration, ms	130 (160, 100)	110 (140, 100)†
Atrial fibrillation, n (%)§	7 (12)	98 (8)
Female, n (%)	9 (15)	183 (16)
Diuretic therapy, n (%)	55 (92)	866 (74)†
Digitalis therapy, n (%)	36 (60)	685 (58)
<b>Mortality</b>		
Crude rate, n (%)	29 (48)	183 (16)†
Adjusted rate, %¶	3.0%	0.7%†

# Evidens ? -3



**Figure 1** Probability of Survival in VHR Patients

Kaplan-Meier estimates of the probability of survival, by treatment group, in very high-risk (VHR) patients. CONV = conventional therapy group; ICD = implantable cardioverter-defibrillator.



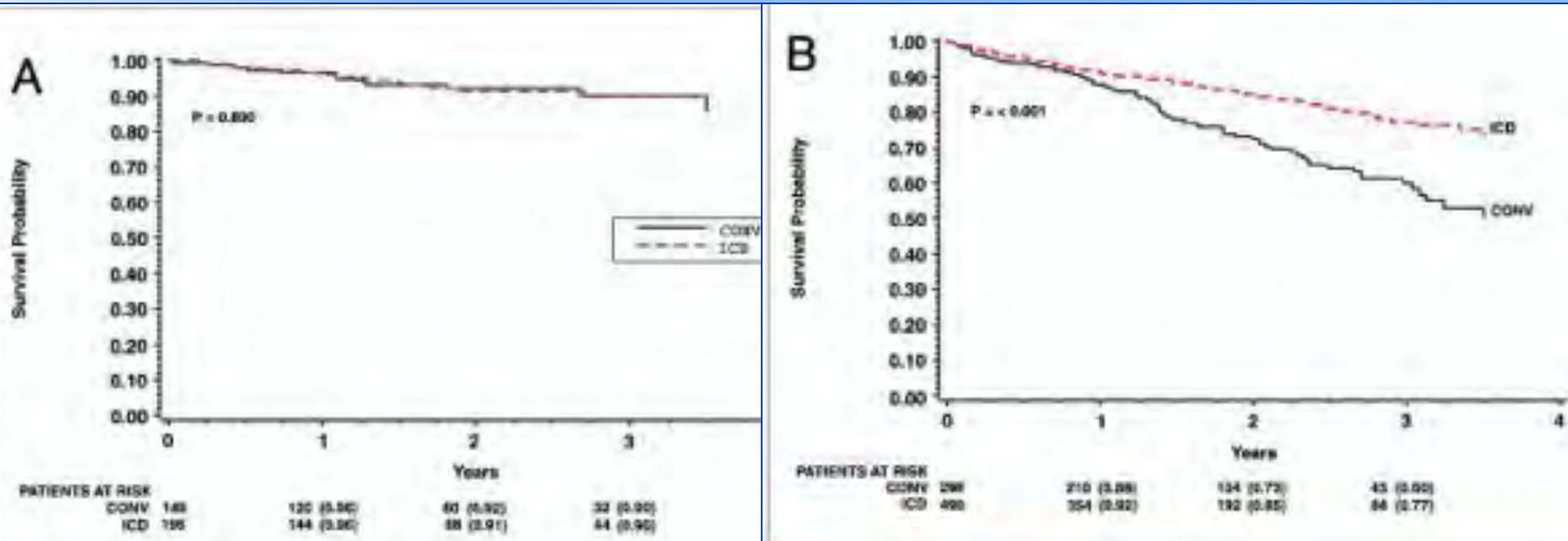
# Evidens ? -4

**Table 4**

**Multivariate Proportional Hazards Regression Model: Risk of All-Cause Mortality in the Conventional Therapy Group for Selected Risk Factors\*†**

<b>Risk Factor</b>	<b>HR</b>	<b>95% Confidence Interval</b>	<b>p Value</b>
NYHA functional class >II	1.87	1.23-2.86	0.004
Atrial fibrillation‡	1.87	1.05-3.22	0.034
QRS >120 ms	1.65	1.08-2.51	0.020
Age >70 yrs	1.57	1.02-2.41	0.042
BUN >26 mg/dl (and <50 mg/dl)	1.56	1.00-2.42	0.048

# Evidens ? -5

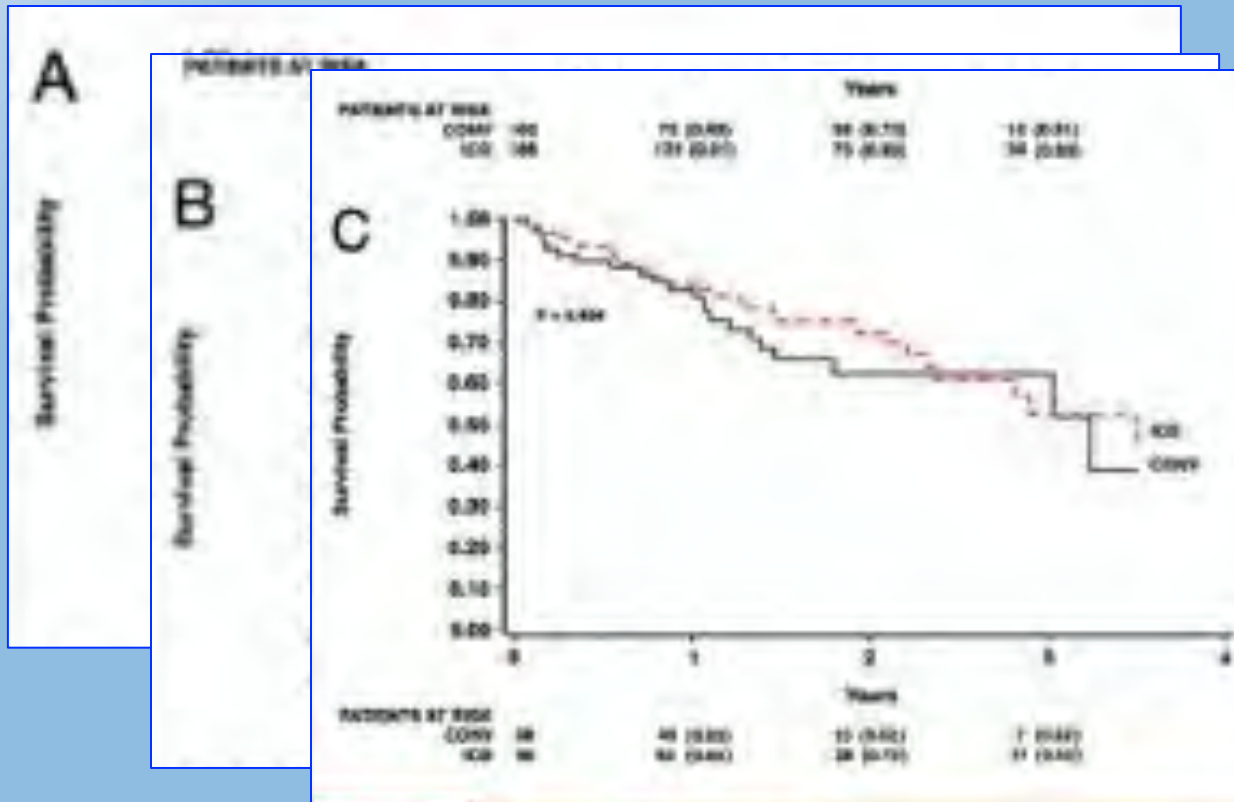


**Figure 2**

## Probability of Survival in Patients With Risk Scores 0 and $\geq 1$

Kaplan-Meier estimates of the probability of survival, by treatment group, in **(A)** patients with risk score = 0; and **(B)** patients with risk score  $\geq 1$ . Analysis was conducted after omitting VHR group; in addition, 22 conventional and 19 ICD patients were omitted due to missing information on risk factors. Abbreviations as in Figure 1.

# Evidens ? -6

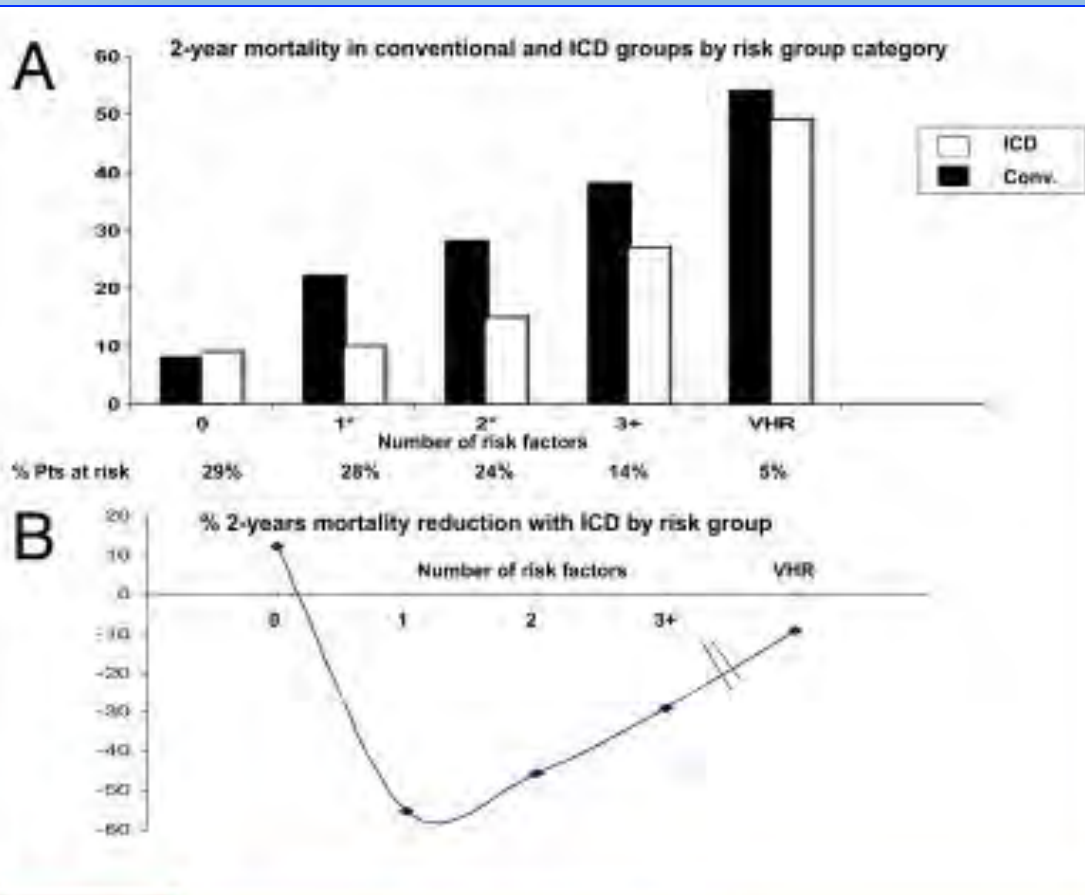


**Figure 3**

## Probability of Survival in Patients With Risk Scores 1, 2, and $\geq 3$

Kaplan-Meier estimates of the probability of survival, by treatment group, in (A) patients with risk score = 1; (B) patients with risk score = 2; and (C) patients with risk score  $\geq 3$ . Analysis was conducted after omitting VHR group; in addition, 22 conventional and 19 ICD patients were omitted because missing information on risk factors. Abbreviations as in Figure 1.

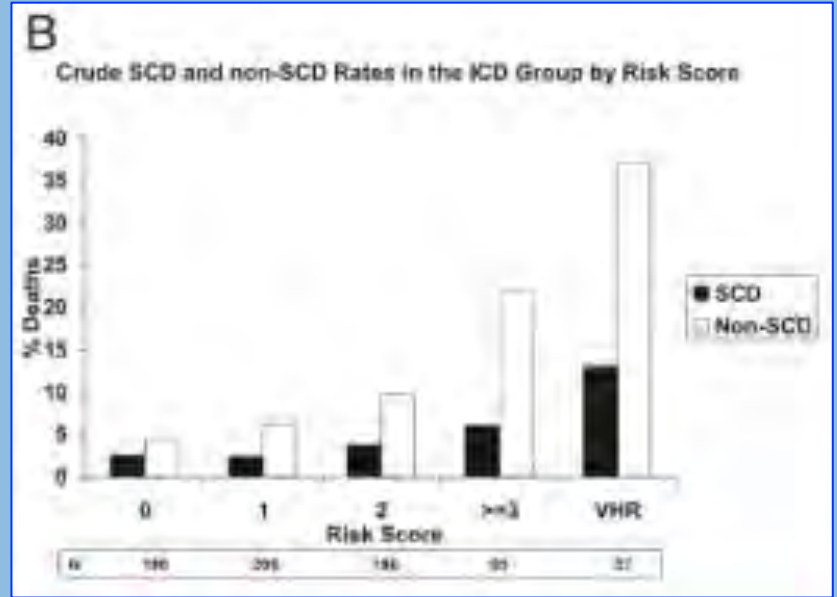
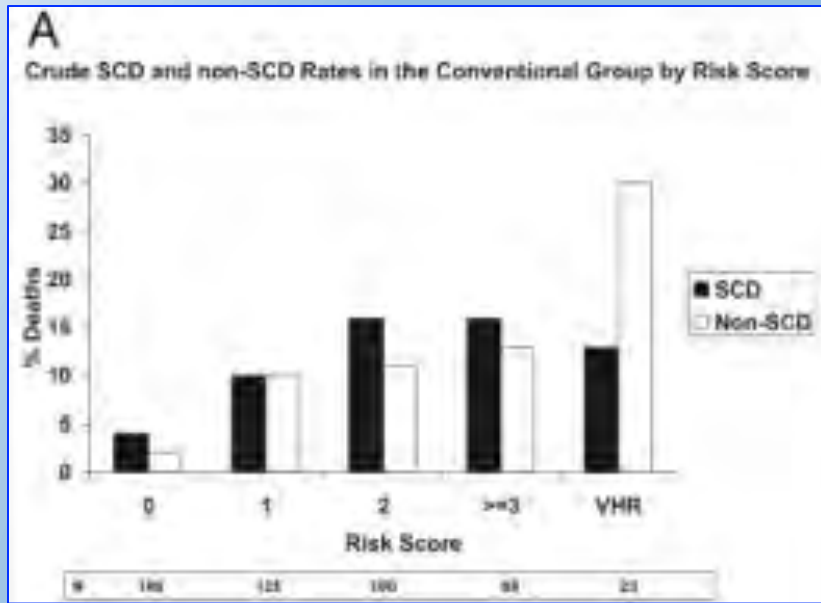
# Evidens ? -7



**Figure 4** U-Shaped Curve for ICD Efficacy

(A) Two-year Kaplan-Meier mortality rates in the ICD and conventional therapy groups; and (B) the corresponding 2-year mortality rate reduction with an ICD, by risk score and in VHR patients. \* $p < 0.05$  for the comparison between the conventional therapy and ICD groups. Abbreviations as in Figure 1.

# Evidens ? -8



**Figure 5** Mode of Death by Risk Group

Percent of sudden cardiac deaths (SCD) and nonsudden deaths (e.g., all other modes of all-cause mortality) presented as the number of deaths per number of patients in each risk category. In **(A)** the conventional therapy group and **(B)** the ICD group. The mode of death was not determined in 28 (15%) cases that were distributed similarly among risk groups and omitted. Abbreviations as in figure 1.

# Evidens ? -9

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Published by Elsevier Inc.

Vol. 59, No. 21, 2012  
ISSN 0735-1097/106.00  
doi:10.1016/j.jacc.2012.02.036

**Heart Rhythm Disorders**

## **Applicability of a Risk Score for Prediction of the Long-Term (8-Year) Benefit of the Implantable Cardioverter-Defibrillator**

Alon Barsheshet, MD, Arthur J. Moss, MD, David T. Huang, MD, Scott McNitt, MSc,  
Wojciech Zareba, MD, PhD, Ilan Goldenberg, MD

*Rochester, New York*

Modellen holder  
Effekt også påvist i low risk gruppen

# Evidens ?

ORIGINAL ARTICLE

## Evaluation of the need of elective implantable cardioverter-defibrillator generator replacement in primary prevention patients without prior appropriate ICD therapy

Sing-Chien Yap,<sup>1</sup> Beat A Schaer,<sup>2</sup> Rohit E Bhagwandien,<sup>1</sup> Michael Kühne,<sup>2</sup>  
Lara Dabiri Abkenari,<sup>1</sup> Stefan Osswald,<sup>2</sup> Tamas Szili-Torok,<sup>1</sup> Christian Sticherling,<sup>2</sup>  
Dominic A M J Theuns<sup>1</sup>

Yap S-C, et al. *Heart* 2014;**100**:1188–1192.

# Evidens ?

Table 1 Baseline clinical and demographic characteristics of patients without previous ICD therapy

Characteristic	All patients (n=266)	Patients who received ICD therapy after replacement (n=29)	Patients who did not receive ICD therapy after replacement (n=237)	p Value
Age at implantation, mean±SD, years	57±12	56±11	57±12	0.60
Age at replacement, mean±SD, years	62±12	60±11	62±12	0.51
Female sex, n (%)	67 (25)	6 (21)	61 (26)	0.55
LVEF,* mean±SD, %	27±10	26±14	28±10	0.50
QRS duration, mean±SD, ms	138±39	138.3±32.5	137.6±39.5	0.92
QRS duration >120 ms	150 (56)	18 (62)	132 (56)	0.51
NYHA heart failure class, n (%)				
Class I	37 (14)	6 (21)	31 (13)	0.60
Class II	123 (46)	14 (48)	109 (46)	
Class III	104 (39)	9 (31)	95 (40)	
Class IV	2 (1)	0 (0)	2 (1)	
Cardiomyopathy, n (%)				
Ischaemic	157 (59)	21 (72)	136 (57)	0.12
Non-ischaemic	109 (41)	8 (28)	101 (43)	
Diabetes mellitus, n (%)	55 (21)	5 (17)	50 (21)	0.63
Renal insufficiency, n (%)	59 (22)	7 (24)	52 (22)	0.79
Medication at implantation, n (%)				
ACE inhibitor	220 (83)	24 (83)	196 (83)	0.99
β-Blocker	208 (78)	19 (66)	189 (80)	0.08
Diuretic	165 (62)	19 (66)	146 (62)	0.68
Digoxin	46 (17)	6 (21)	40 (17)	0.67
Amiodarone	41 (15)	7 (24)	34 (14)	0.18
Type of device, n (%)				
CRT-ICD	116 (44)	11 (38)	105 (44)	0.48
Single-chamber ICD	91 (34)	9 (31)	82 (35)	
Dual-chamber ICD	59 (22)	9 (31)	50 (21)	

CAD, coronary artery disease; CRT, cardiac resynchronisation therapy; ICD, implantable cardioverter-defibrillator; NYHA, New York Heart Association.  
\*LVEF data were available for 225 patients.



# Evidens ?

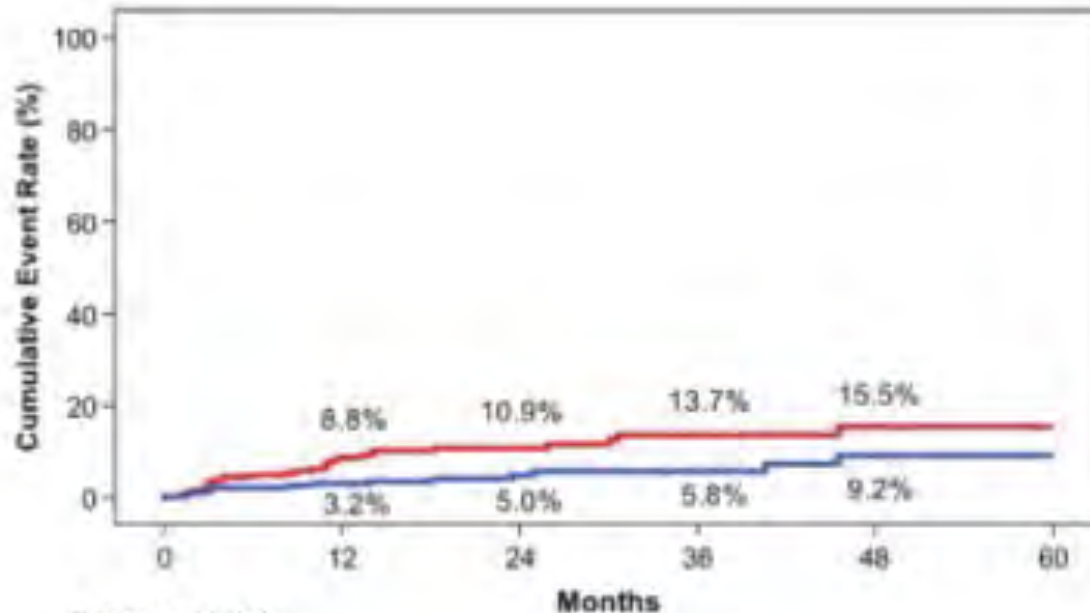
**Table 2** Univariate predictors of appropriate ICD therapy after generator replacement

Variable	Rate of events, n/N (%)		HR (95% CI)	p Value
	Present	Absent		
Ischaemic cardiomyopathy	21/157 (13)	8/109 (7)	2.02 (0.90 to 4.57)	0.09
LVEF <25%*	10/82 (12)	12/143 (8)	1.48 (0.64 to 3.42)	0.36
Renal insufficiency	7/59 (12)	22/207 (11)	1.02 (0.43 to 2.40)	0.96
Diabetes mellitus	5/55 (9)	24/211 (11)	0.82 (0.31 to 2.15)	0.69
CRT-ICD	11/116 (9)	18/150 (12)	0.77 (0.36 to 1.62)	0.49
NYHA $\geq$ III	9/106 (8)	20/160 (12.5)	0.66 (0.30 to 1.44)	0.29
Advanced age (age >70 years at replacement)	4/68 (6)	25/198 (13)	0.49 (0.17 to 1.41)	0.19

CRT, cardiac resynchronisation therapy; ICD, implantable cardioverter-defibrillator; NYHA, New York Heart Association.

\*LVEF data were available for 225 patients.

# Evidens ?



Patients at risk:

266	184	116	65	44	30
266	197	124	72	47	32

**Figure 1** Cumulative event rate for appropriate implantable cardioverter-defibrillator (ICD) therapy after device replacement. The cumulative event rate for appropriate ICD therapy (antitachycardia pacing (ATP) and ICD shock) is denoted by the red line. The cumulative event rate for appropriate ICD shock therapy is denoted by the blue line. The 3-year cumulative event rate for appropriate ICD therapy (ATP and ICD shock) and appropriate ICD shock therapy is 13.7% and 5.8%, respectively.



## Evidens ?

- 7 % komplikationer !
  - Infektion 2.3 %
  - Elektrodeproblemer 2 %
  - Hæmatom medførende re-op 1 %
  - Pneumthora 0.5 %
- 8 % inappr. terapi !
  - Shock vs ATP ikke angivet

# Evidens ?

## **Survival Benefit of the Primary Prevention Implantable Cardioverter-Defibrillator Among Older Patients Does Age Matter? An Analysis of Pooled Data From 5 Clinical Trials**

Paul L. Hess, MD; Sana M. Al-Khatib, MD, MHS; Joo Y. Han, MS; Rex Edwards, BA;  
Gust H. Bardy, MD; J. Thomas Bigger, MD; Alfred Buxton, MD; Riccardo Cappato, MD;  
Paul Dorian, MD; Al Hallstrom, PhD; Alan H. Kadish, MD; Peter J. Kudenchuk, MD;  
Kerry L. Lee, PhD; Daniel B. Mark, MD, MPH; Arthur J. Moss, MD; Richard Steinman, AB;  
Lurdes Y.T. Inoue, PhD; Gillian Sanders, PhD

*Circ Cardiovasc Qual Outcomes*

**March 2015**

# Evidens ?

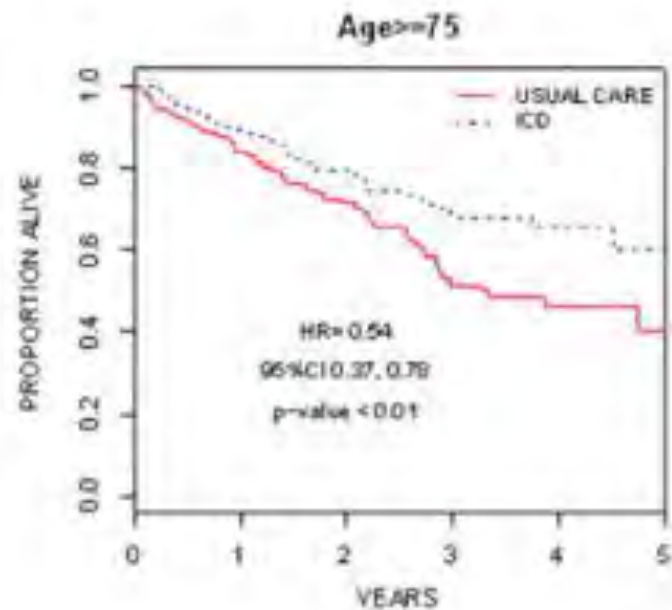
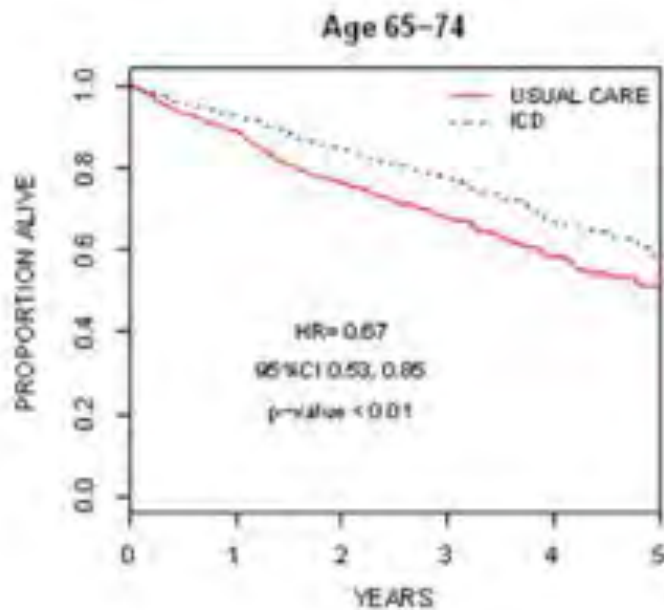
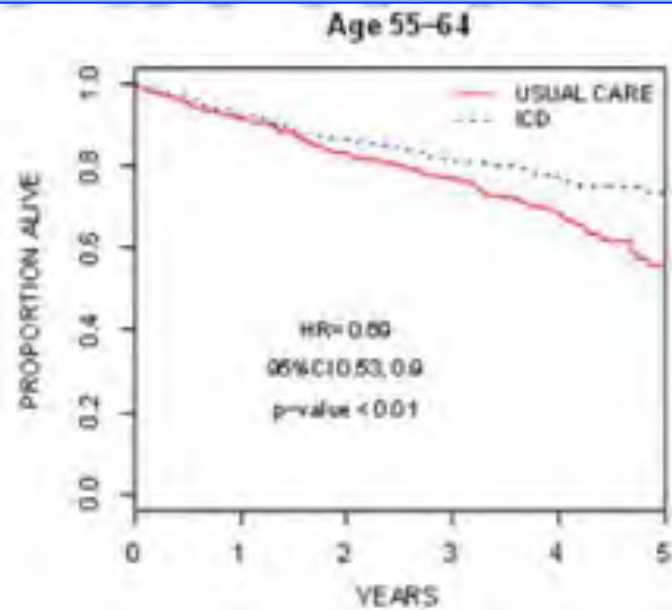
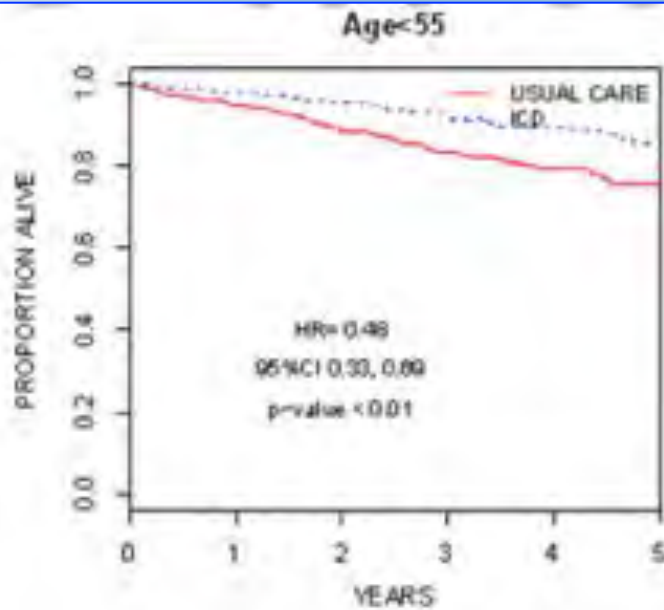
**Table 1. Primary Prevention ICD Trial Characteristics**

Clinical Trial	Participating Countries	Year of Main Publication	Eligible Age Range at Entry, y	Eligible Left Ventricular Ejection Fraction, %	Cardiomyopathy	Factorial Comparison	No. of Participants	Mean Follow-Up, y
MADIT-I <sup>1</sup>	US, Italy, Germany	1996	25–80	≤35	Ischemic	ICD vs conventional medical therapy	95 vs 101	2.40 vs 2.07
MUSTT <sup>2</sup>	US, Canada	1999	<80	≤40	Ischemic	ICD or antiarrhythmic drugs vs placebo	167 vs 537	3.55 vs 3.16
MADIT-II <sup>3</sup>	US, the Netherlands, Germany, Israel	2002	>21	≤30	Ischemic	ICD vs conventional medical therapy	742 vs 490	1.71 vs 1.64
DEFINITE <sup>4</sup>	US	2004	21–80	<36	Nonischemic	ICD vs conventional medical therapy	229 vs 229	2.55 vs 3.40
SCD-HeFT <sup>5</sup>	US, Canada	2005	>10	≤35	Ischemic or nonischemic	ICD vs placebo vs amiodarone	629 vs 1692	3.40 vs 3.33

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# Evidens ?



# Evidens ?

## **Conclusions**

In this analysis of 3530 patients from 5 clinical trials, the survival benefit of ICD therapy is attenuated with increasing age and may be related to an accompanying increase in the burden of comorbid illness. The survival benefit nonetheless seems to persist. Randomized data of patients aged  $\geq 75$  years of age are sparse, and this may in part explain the observed attenuation in ICD survival benefit. More studies among older patients are needed. There was no evidence that age modifies the association between ICD treatment and rehospitalization.

Obs: Studiepatienter, obs selektionsbias

# Evidens ?



Europace (2015) 17, 409–416  
doi:10.1093/europace/euu248

**CLINICAL RESEARCH**  
*Sudden death and ICDs*

## **Cardioverter-defibrillator implantation and generator replacement in the octogenarian**

**Manoj Goonewardene, Sérgio Barra\*, Patrick Heck, David Begley, Simon Fynn, Munmohan Virdee, Andrew Grace, and Sharad Agarwal**

Cardiology Department, Papworth Hospital NHS Foundation Trust, Papworth Everard, Cambridge CB22 3RE, UK

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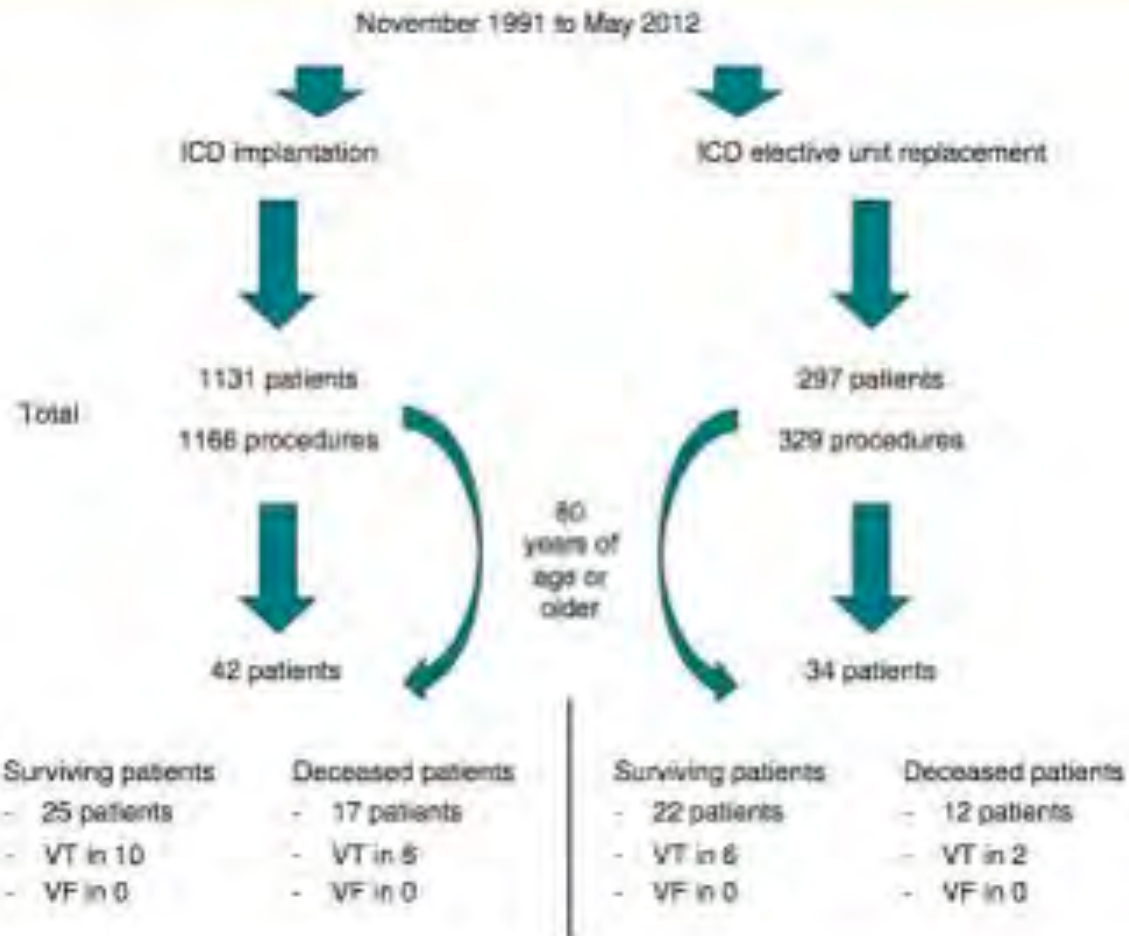


**Table 2** Patients 80 years of age or older admitted for ICD or CRT-D EUR

	Surviving patients (N = 22)	Deceased patients (N = 12)
Age at last EUR	81.2	82.0
Age at last follow-up/age at death	84	83.8
Additional years of life	2.1	1.84
Male gender	78.3%	83.3%
Reason for implant: primary/secondary prevention of SCD	12.5%/87.5%	41.7%/58.3%
History of coronary artery disease <sup>a</sup>	86.3%	83.3%
Severe LV systolic function <sup>b</sup>	59.1%	66.7%
Haemoglobin (g/dL) <sup>c</sup>	13.1	12.2
Creatinine ( $\mu\text{mol/L}$ ) <sup>c</sup>	125.4	165.7
Dual-chamber ICD	54.5%	50%
CRT	27.2%	0%
Beta-blockers at EUR	63.6%	66.7%
Antiarrhythmics at EUR <sup>d</sup>	63.6%	75%
ACEI and/or ARB at EUR	91%	91.7%
VT post-initial ICD implantation and before last EUR	54.5%	50%
VT post-last EUR	27.3%	16.7%
VF post-last EUR	0%	0%
Any appropriate ICD therapy	13.6%	8.3%
Any ICD shock	0%	0%
ATP only	13.6%	0%
Both	0%	8.3%
Any inappropriate ICD therapy	0%	0%

EUR:  
Elective Unit Replacement

# Evidens ?



**Figure 3** Summary of our study results.

# Evidens ?

## Main findings of our study

We found a low survival time in octogenarian patients admitted for ICD implantation or EUR, especially the latter. In fact, the median additional years of life after ICD implantation and ICD EUR in patients who died before data retrieval was 2.5 and 1.2, respectively, and while 65% of deceased patients after ICD implantation died in the first 3 years after the procedure, 50% of deceased post-ICD EUR patients died within the first year. In both groups (ICD implantation and ICD EUR), the risk of mortality seemed higher in patients who had the device implanted for primary prevention of SCD (vs. secondary prevention) and most episodes of VT treated by the ICD were seen in those who had the ICD implanted for secondary prevention.

# Nye tiltag...



Europace (2015) 17, 174–186  
doi:10.1093/europace/euu296

REVIEW

## Implantable cardioverter-defibrillators in the elderly: rationale and specific age-related considerations

Sérgio Barra<sup>1\*</sup>, Rui Providência<sup>2</sup>, Luís Paiva<sup>3</sup>, Patrick Heck<sup>1</sup>, and Sharad Agarwal<sup>1</sup>

<sup>1</sup>Cardiology Department, Papworth Hospital NHS Foundation Trust, Papworth Everard, Cambridge CB23 3RE, UK; <sup>2</sup>Cardiology Department, University College London Hospitals NHS Foundation Trust, London, UK; and <sup>3</sup>Cardiology Department, Coimbra Hospital and University Centre, Coimbra, Portugal



# NBV 2015

*Den ældre ICD-patient med faldende batterispænding – ny ICD?*



# Løsninger ?

- Regelmæssig efterårsgravning af guidelines
- Planlægge studier på udvalgte subgrupper
- Stor indsats for at ændre fastgroet praksis
- Dialog med patienterne
- Vigtig rolle for de videnskabelige selskaber
- Ændret afregningspraksis som styringsredskab ?
- Men kan ånden komme tilbage i flasken ?

Fordi man kan, skal man ikke altid...

