돌연심장사 예방; ICD in CHF

가천의대
순환기내과
최인석

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돌연심장사의 역학

- NYHA functional class II → IV
  - 연간 사망률; 10% → 50%
  - 돌연사 비율; 65% → 20%

  (BF Uretsky et al. J Am Coll Cardiol 1997 30:1589)
- 돌연사 대다수 원인; 심실빈맥성 부정맥

  (WG Stevenson et al. Circulation 1993 88: 2953)
- 원외 심정지 피해자
  - 대부분(>95%) 사망
  - 소생 후 돌연사 재발 위험 높음

돌연심장사 이차예방(1)

- 기저심질환 확인/적절한 치료;

관상동맥조영술→심한 다혈관질환→CABG 시행→돌연사 위험(46%, 전체 사망률 25%)
↓

(SOLVD Veenhuyzen GD et al. Circulation. 2001;104:1489)

- 약물치료

- 베타차단제
- ACE차단제
- spironolactone

돌연심장사 이차예방(2)

- VF/지속성 단형VT에서 소생
  - AVID (Antiarrhythmics Versus Implantable Defibrillators) (AVID) Investigators. N Engl J Med 1977;337:1576)
  - CASH (Cardiac Arrest Study Hamburg) (Kuck K-H, Cappato R et al. Circulation. 2000;102:748)
  - CIDS (Canadian Implantable Defibrillator Study) (Connolly SJ et al. Circulation. 2000;101:1297)
- ICD >> 부정맥 치료제(amiodarone)
  - 돌연사/전체 사망률 ↓효과 우수

(Connolly SJ et al. Eur Heart J. 2000;21:2071)

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돌연심장사 일차예방;허혈성 심부전(1)

- ICD와 약제의 효과를 비교 연구
  - MADIT (Multicenter Automatic Defibrillator Implantation Trial)
    I (Moss AJ et al. N Engl J Med 1996;335:1933)
    II (Moss AJ et al. N Engl J Med 2002;346:877)
  - MUSTT (Multicenter Unsustained Tachycardia Trial)
    (Buxton AE et al. N Engl J Med. 1999 ;341:1882)
  - CABG-Patch (Coronary Artery Bypass Graft-Patch Trial)
    (Bigger JT Jr. et al. N Engl J Med 1997;337:1569)
- MADIT II/MUSTT 연구
  - 선정기준; NYHA functional class 항목 없음
  - 환자 2/3; NYHA functional class II, III

돌연심장사 일차예방;허혈성 심부전(2)

- MADIT
- MI, LVEF≤35%, 무증상 비지속성 VT
- ICD시술; procainimide→EPS→지속성 VT/VF
- 27개월 후 사망률 54%↓

돌연심장사 일차예방;허혈성 심부전(3)

- MADIT II
- MI, LVEF≤30%, 비지속성 VT
- 대다수 환자; 베타/ACE차단제, statins
- 20개월 전체사망률; 31% ↓
  (ICD시술군 14.2%, 전통적 치료군 19.8%)

돌연심장사 일차예방;허혈성 심부전(4)

- MUSTT

- MI, LVEF≤40%, 비지속성 VT, EPS상 VT유발
- 전통적 치료; 부정맥약제(-), 베타/ACE차단제

  EPS지침; 부정맥약제→EPS 반복→ICD시술
- EPS지침 치료군(5년 관찰);

  돌연사율 27%, 전체 사망률 20%↓
- ICD시술군 vs. 전통적 치료군;

  돌연사율 73%, 전체 사망률 55%↓

돌연심장사 일차예방;허혈성 심부전(5)

- CABG-Patch

- LVEF≤35%, SAECG(+)
- CABG 시행시 ICD 무작위 이식
- 32개월 후 사망률; 유의한 차이 없음
  (대조군 24%, ICD군 27%)
- 기저심질환의 치료 >> 종래 위험예측 표식자에 의존한 ICD시술

돌연심장사 일차예방; 비허혈성 심부전(1)

- 대규모 연구

- AMIOVIRT
(Amiodarone Versus Implantable Cardioverter-Defibrillator)
(Strickberger SA et al. J Am Coll Cardiol 2003, 41;10:1707)

- CAT(Cardiomyopathy Arrhythmia Trial)
(Bansch D et al. Circulation. 2002 Mar 26;105(12):1453)

- DEFINITE
(The Defibrillators in Nonischemic Cardiomyopathy Treatment Evaluation)
(Kadish A et al. N Engl J Med 2004;350:2151)
(Kadish A et al. Pacing Clin Electrophysiol 2000;23:338)

돌연심장사 일차예방; 비허혈성 심부전(2)

- AMIOVIRT
- LVEF≤35%, 무증상 비지속성 VT
- ICD시술 vs. 아미오다론
- 3년 후 전체 사망률 ;12% vs. 13%

돌연심장사 일차예방; 비허혈성 심부전(3)

- CAT
- LVEF≤30%
- ICD시술 효과; 전체 사망률; <10%, 차이(-)
- 비지속성 VT 유무; 결과에 큰 영향 없음

돌연심장사 일차예방; 비허혈성 심부전(4)

- DEFINITE
  - LVEF≤35%, VPC≥10개/분 or 비지속성 VT
  - 베타/ACE 차단제 + ICD시술
  - 돌연심장사 ↓
  - 전체 사망률; 14.1% vs. 7.9%, 유의성(-)

SCD-HeFT (Sudden Cardiac Death in Heart Failure Trial)

- class II-III 심부전, LVEF≤35%
  - 관상동맥질환(CAD) 무관
- ICD이식; shock-only, single-lead
  - vs. amiodarone, 위약(placebo)
- 2년 사망률; 위약군 대략 14%
- 평균 4년 추적관찰
  - ICD시술군(22%); 사망률 23%↓(CAD 무관)
  - 아미오다론군(28%), 위약군(29%); 차이(-)

(Bardy GH. N Engl J Med. 2005;352:225)

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일차예방 대상환자 선정(1)

- 심부전 환자의 실신; VT 배제할 수 없다면 돌연사 위험 높음

(Middlekauff HR et al. J Am Coll Cardiol. 1993;21:110)

- EPS; 실신원인 추정

1. 허혈성; LVEF 양호시 도움

2. 비허혈성; 도움 안됨→경험적 선별

(Saxon LA, et al. Cardiac Electrophysiology Review. 2002;6:18)
(Knight BP et al. J Am Coll Cardiol 1999;33:1964)

일차예방 대상환자 선정(2)

- LVEF

- 낮을수록 심장사망률 ↑; 50% 정도 돌연사
- LVEF(≤35-40%); 예측 표식자

(The Multicenter Postinfarction Research Group. N Engl J Med. 1983;309:331), (Rouleau JL et al. J Am Coll Cardiol. 1996;27:1119)

- DINIMIT (Defibrillator in Acute Myocardial Infarction Trial)

(Hohnloser SH et al. Am Heart J. 2000;140:735)

(Hohnloser SH et al. Annual Meeting of American College of Cardiology; March 7 to 10, 2004; New Orleans, La.)

; AMI 후<40일, LVEF<35%

; 생존율 개선 못함

일차예방 대상환자 선정(3)

- 비지속성 VT
  - 심한 CHF 환자 Holter; 대략 80%(+)
  - positive predictive value; 낮음
    (Saxon LA et al. Cardiac Electrophysiology Review. 2002;6:18)
  - LVEF과 병용하면 유용
    (Buxton AE et al. Circulation. 2005;111:2537)

일차예방 대상환자 선정(4)

- 기타 비관혈적 위험예측 표식자
  - T파 교류(T-wave alternans)
  - SAECG (signal averaged ECG)
  - 자율신경계 상태 반영 ; 심박 변동성(HRV), 압수용체 과민성(baroreceptor sensitivity)
  - 비관혈적 표식자 단독/병행 사용 대부분 연구 ; positive predictive value 20-30%로 비교적 낮음 (Zipes DP et. Circulation. 1998;98:2334)

일차예방 대상환자 선정(5)

- 돌연심장사 예측에 여러 표식자 함께 고려
  (Buxton AE et al. J Am Coll Cardiol. 2004;43:425A)

1. NYHA functional class 불량
2. 좌각차단/비특이적 심실내 전도지연
3. digitalis로 치료 중
4. 입원중 비지속성 심실빈맥
5. 고령(연령>65세)

요약

1. 이차예방에 ICD가 최선의 치료이다.
   (Connolly SJ et al. Eur Heart J. 2000;21:2071)
2. 허혈성 심부전에서 심장돌연사 일차예방에 효과가 있다.
3. 비허혈성 심부전에서 심장돌연사 일차예방의 경향이 있으나 허혈성 심부전에서 처럼 확실하지 않다.
4. 실신/LVEF 외의 표식자로 돌연심장사 위험을 예측하는 것은 불가능하므로 새로운 표식자를 함께 고려하여 돌연심장사를 예측하는 데 도움을 얻을 수 있다. (Buxton AE et al. J Am Coll Cardiol. 2004;43:425A)

결론

1. 가장 신뢰할 수 있는 일차/이차예방법
   - 돌연심장사 발생예방(경감) ; 제거가 아님
   - 쇼크의 빈도 줄이기 ; 약물치료의 병행
     - defibrillation threshold 상승
     - ICD 기능 추적검사; 치료효과에 영향
2. 치료의 비용효과(cost-effectiveness)
   - 고비용 치료가 사회적 부담
   - 일차예방대상 선별방법 개발
   - VT/VF의 재발위험 본질적 감소

; 단순하고 저렴한 ICD를 이식

- 심내지도화(intra-cardiac mapping)
- 도자절제술(transcatheter ablation)

경청해 주셔서 감사합니다!

Class I

1. **Cardiac arrest due to VF or VT not due to a transient or reversible cause.** ***(Level of Evidence: A)*** **(103-105,202,203,205-211,216,217,219,221,238,260,267, 269,406,407)**
2. **Spontaneous sustained VT in association with structural heart disease.** ***(Level of Evidence: B)*** **(103-105,202,203,205-211,216,217,219)**
3. **Syncope of undetermined origin with clinically relevant, hemodynamically significant sustained VT or VF induced at electrophysiologic study when drug therapy is ineffective, not tolerated, or not preferred.** ***(Level of Evidence: B)*** **(204,213,215,219,227,228, 266,406)**

4. **Nonsustained VT in patients with coronary disease, prior MI, LV dysfunction, and inducible VF or sustained VT at electrophysiologic study that is not suppressible by a Class I antiarrhythmic drug.** ***(Level of Evidence: A)*** **(220,308,405)**
5. **Spontaneous sustained VT in patients without structural heart disease not amenable to other treatments.** ***(Level of Evidence: C)***

Class IIa

Patients with left ventricular ejection fraction of less than or equal to 30% at least 1 month post myocardial infarction and 3 months post coronary artery revascularization surgery. ***(Level of Evidence: B)*** **(429)**

Class IIb

1. Cardiac arrest presumed to be due to VF when electrophysiologic testing is precluded by other medical conditions. *(Level of Evidence: C)* (211,218,267,276)
2. Severe symptoms (e.g., syncope) attributable to ventricular tachyarrhythmias in patients awaiting cardiac transplantation. *(Level of Evidence: C)* (310,311)
3. Familial or inherited conditions with a high risk for life-threatening ventricular tachyarrhythmias such as long-QT syndrome or hypertrophic cardiomyopathy. *(Level of Evidence: B)* (8,41,277,282,284,288,300-302)

4. **Nonsustained VT with coronary artery disease, prior MI, LV dysfunction, and inducible sustained VT or VF at electrophysiologic study.** ***(Level of Evidence: B)*** **(103,205,212,217,220,307,308)**
5. **Recurrent syncope of undetermined origin in the presence of ventricular dysfunction and inducible ventricular arrhythmias at electrophysiologic study when other causes of syncope have been excluded.** ***(Level of Evidence: C)***
6. **Syncope of unexplained origin or family history of unexplained sudden cardiac death in association with typical or atypical right bundle-branch block and ST-segment elevations (Brugada syndrome).** ***(Level of Evidence: C)*** **(443,444)**

7. Syncope in patients with advanced structural heart disease in whom thorough invasive and noninvasive investigations have failed to define a cause. *(Level of Evidence: C)*

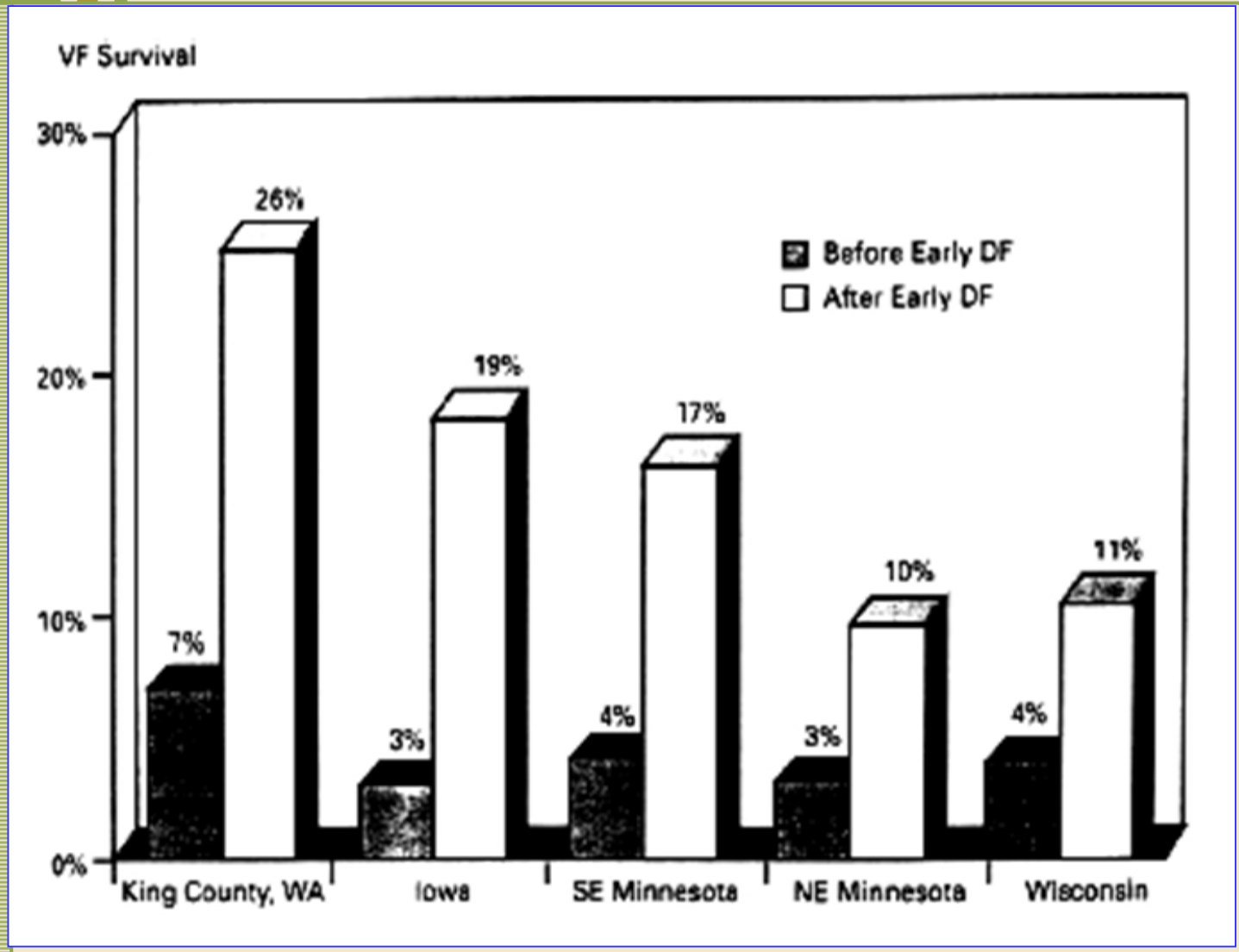
Class III

1. Syncope of undetermined cause in a patient without inducible ventricular tachyarrhythmias and without structural heart disease. *(Level of Evidence: C)*
2. Incessant VT or VF. *(Level of Evidence: C)*
3. VF or VT resulting from arrhythmias amenable to surgical or catheter ablation; for example, atrial arrhythmias associated with the Wolff-Parkinson-White syndrome, right ventricular outflow tract VT, idiopathic left ventricular tachycardia, or fascicular VT. *(Level of Evidence: C)* (259-263)

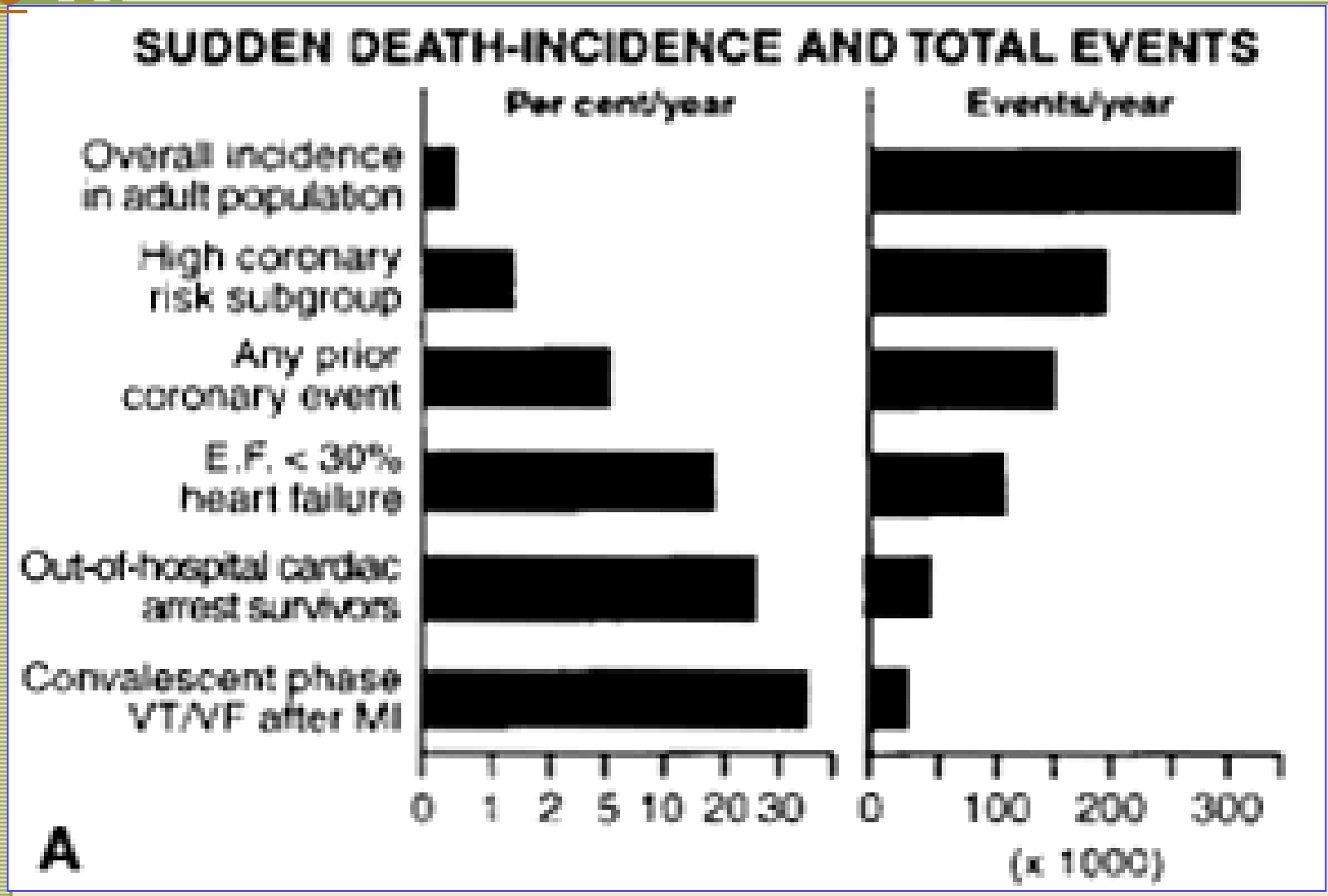
4. Ventricular tachyarrhythmias due to a transient or reversible disorder (e.g., AMI, electrolyte imbalance, drugs, or trauma) when correction of the disorder is considered feasible and likely to substantially reduce the risk of recurrent arrhythmia. *(Level of Evidence: B)* (414,445,446)
5. Significant psychiatric illnesses that may be aggravated by device implantation or may preclude systematic follow-up. *(Level of Evidence: C)* (316,317)
6. Terminal illnesses with projected life expectancy less than 6 months. *(Level of Evidence: C)*

7. Patients with coronary artery disease with LV dysfunction and prolonged QRS duration in the absence of spontaneous or inducible sustained or nonsustained VT who are undergoing coronary bypass surgery. *(Level of Evidence: B)* (309)
8. NYHA Class IV drug-refractory congestive heart failure in patients who are not candidates for cardiac transplantation. *(Level of Evidence: C)*

경청해 주셔서 감사합니다!


VF Survival
30%
20%
10%
0%
26%
7%
19%
3%
17%
4%
10%
3%
11%
4%
Before Early DF
After Early DF
King County, WA
Iowa
SE Minnesota
NE Minnesota
Wisconsin

b


SUDDEN DEATH-INCIDENCE AND TOTAL EVENTS
Per cent/year
Events/year
Overall incidence in adult population
High coronary risk subgroup
Any prior coronary event
E.F. < 30% heart failure
Out-of-hospital cardiac arrest survivors
Convalescent phase VT/VF after MI
0 1 2 5 10 20 30
0 100 200 300
(x 1000)
A

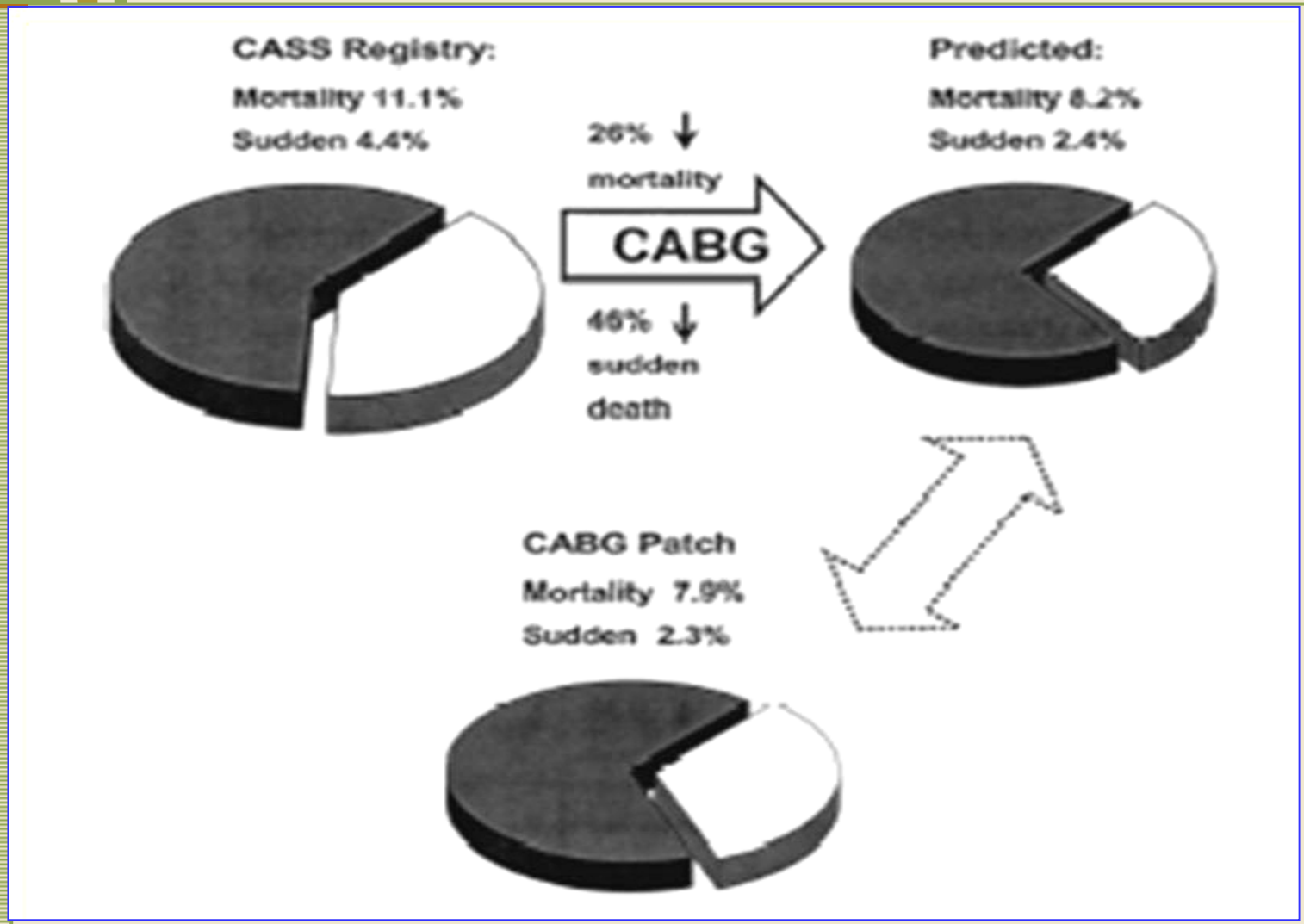
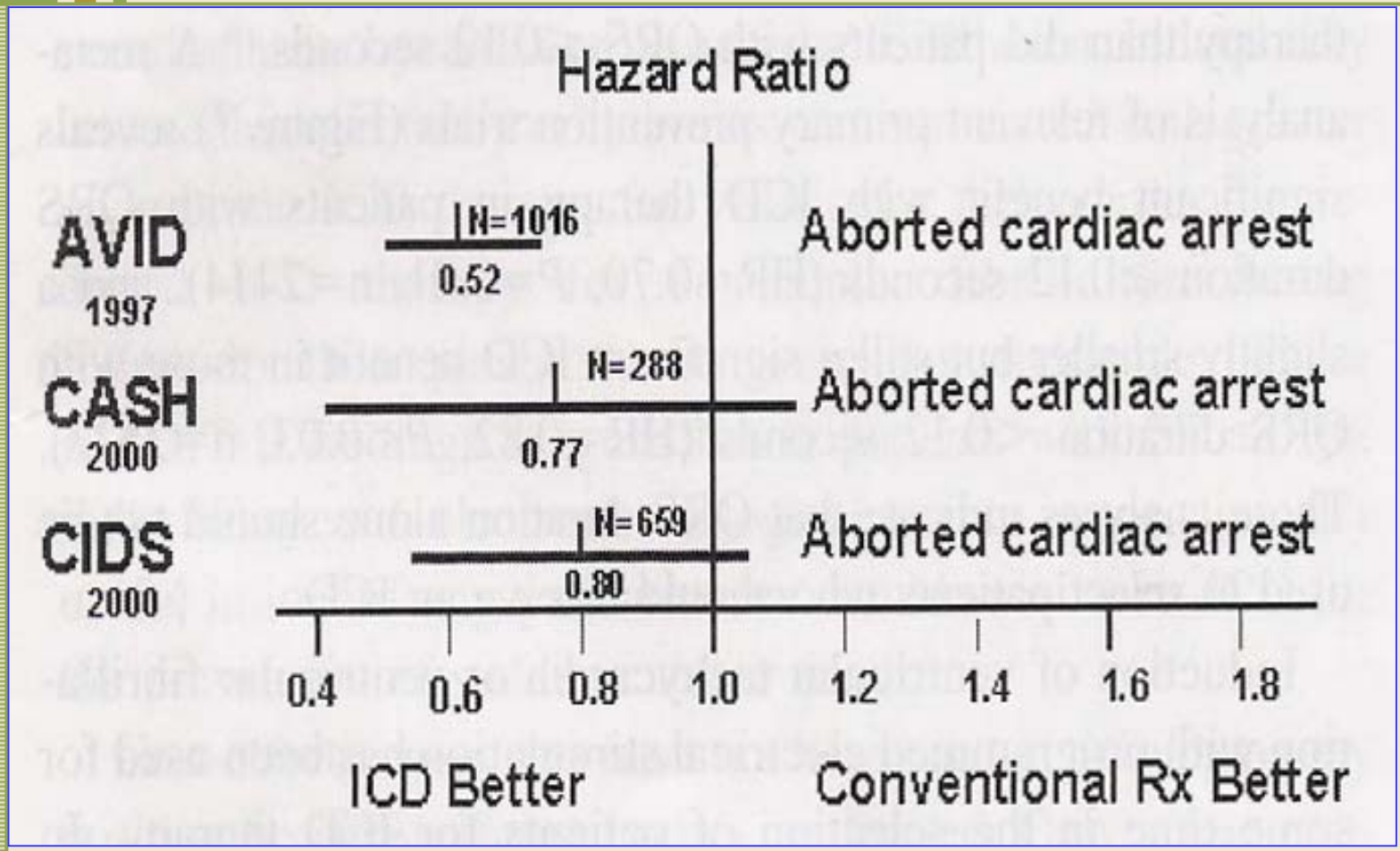

CASS Registry:
Mortality 11.1%
Sudden 4.4%
26% ↓
mortality
CABG
46% ↓
sudden
death
Predicted:
Mortality 8.2%
Sudden 2.4%
CABG Patch
Mortality 7.9%
Sudden 2.3%

TABLE 2. Randomized Secondary-Prevention ICD Trials

Trial	Date Started; Date Published	No. of Patients	Eligibility	Average Follow-Up, mo	Reference
AVID (ICD vs AAD)	06/01/1993; 11/27/1997	1016	Near-fatal VF, VT with syncope or hemodynamic compromise	18	6
CIDS (ICD vs amiodarone)	10/01/1990; 03/21/2000	659	Near-fatal VF, VT with syncope or hemodynamic compromise, unmonitored syncope thought to be result of VT	36	7
CASH (ICD vs amiodarone vs metoprolol)	03/01/1997 08/15/2000	288	Resuscitated from cardiac arrest secondary to sustained VT/VF	48	8

AAD indicates antiarrhythmic drugs; VF, ventricular fibrillation; and VT, ventricular tachycardia.


Hazard Ratio
AVID
1997
N=1016
0.52
Aborted cardiac arrest
CASH
2000
N=288
0.77
Aborted cardiac arrest
CIDS
2000
N=659
0.80
Aborted cardiac arrest
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
ICD Better
Conventional Rx Better

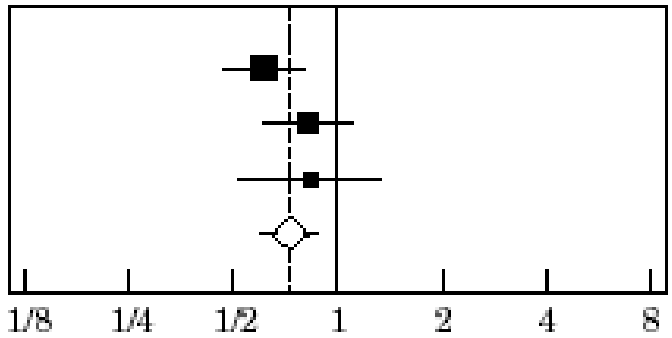
Total mortality

Name	n	Events	HR	95% CI
AVID	1016	80	0·62	0·47, 0·81
CIDS	659	83	0·82	0·61, 1·10
CASH	191	37	0·83	0·52, 1·33

Fixed effects HR = 0·72 95% = 0·60, 0·87

Test for association (U = 11·77 on 1 df) P = 0·00060

Test for heterogeneity (Q = 2·37 on 2 df) P = 0·30550



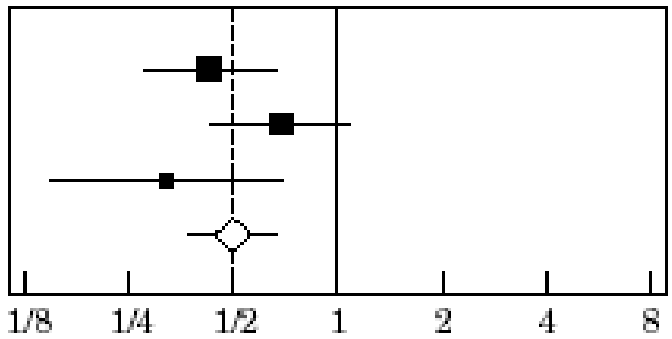
Arrhythmic mortality

Name	n	Events	HR	95% CI
AVID	1016	24	0·43	0·27, 0·66
CIDS	659	30	0·68	0·43, 1·08
CASH	191	7	0·32	0·15, 0·69

Fixed effects HR = 0·50 95% = 0·37, 0·67

Test for association (U = 21·73 on 1 df) P = 0·00000

Test for heterogeneity (Q = 3·57 on 2 df) P = 0·16807



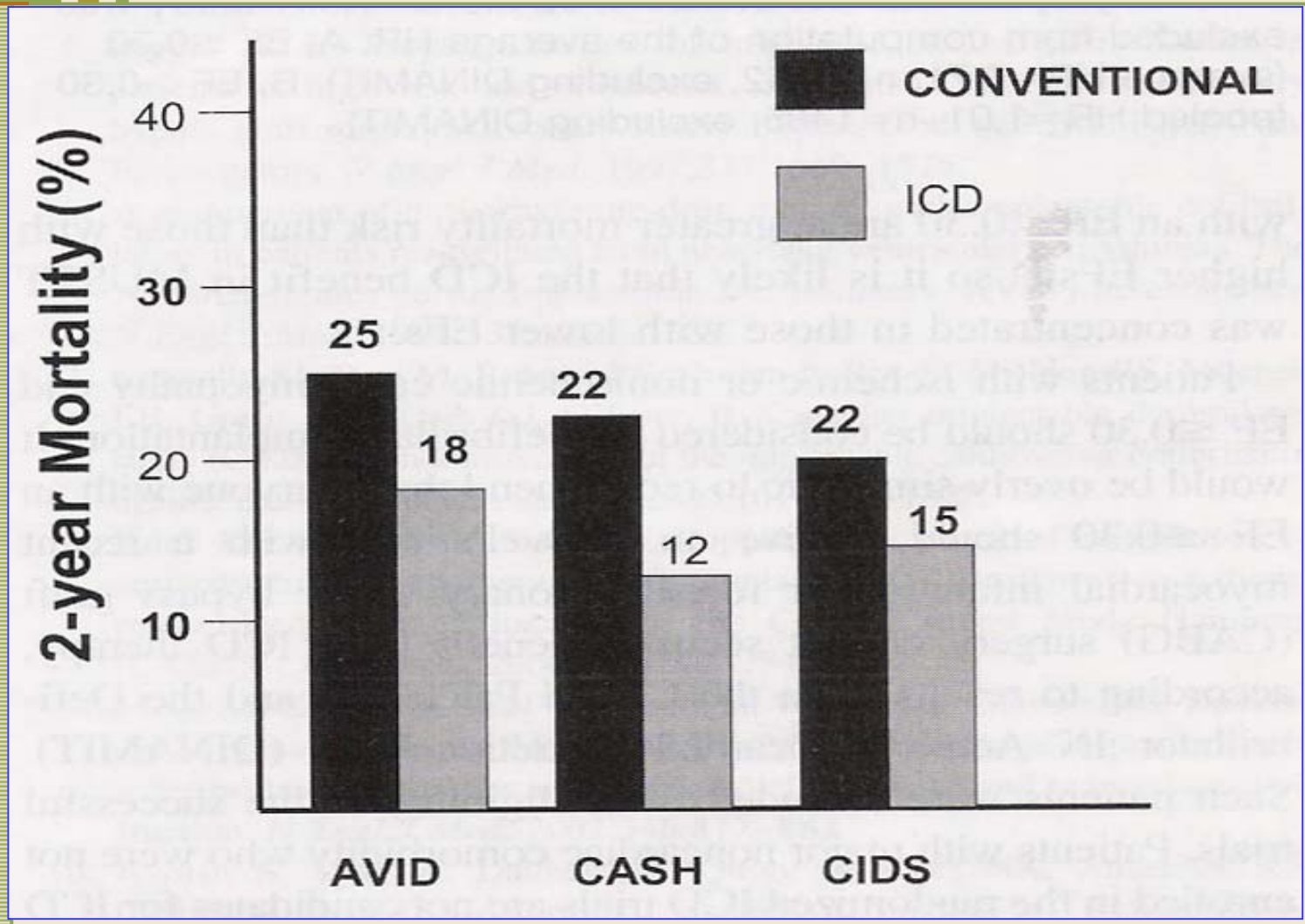
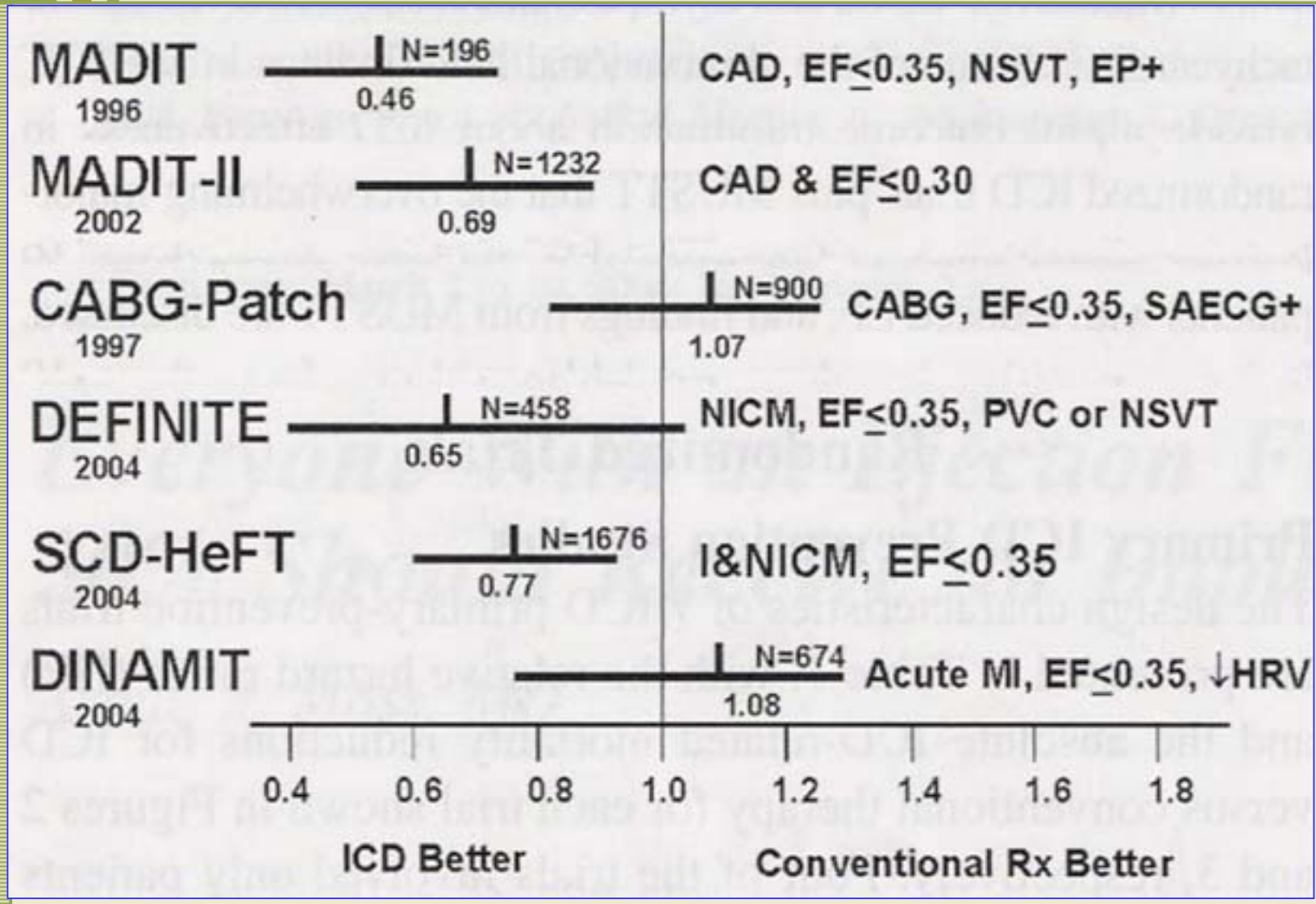
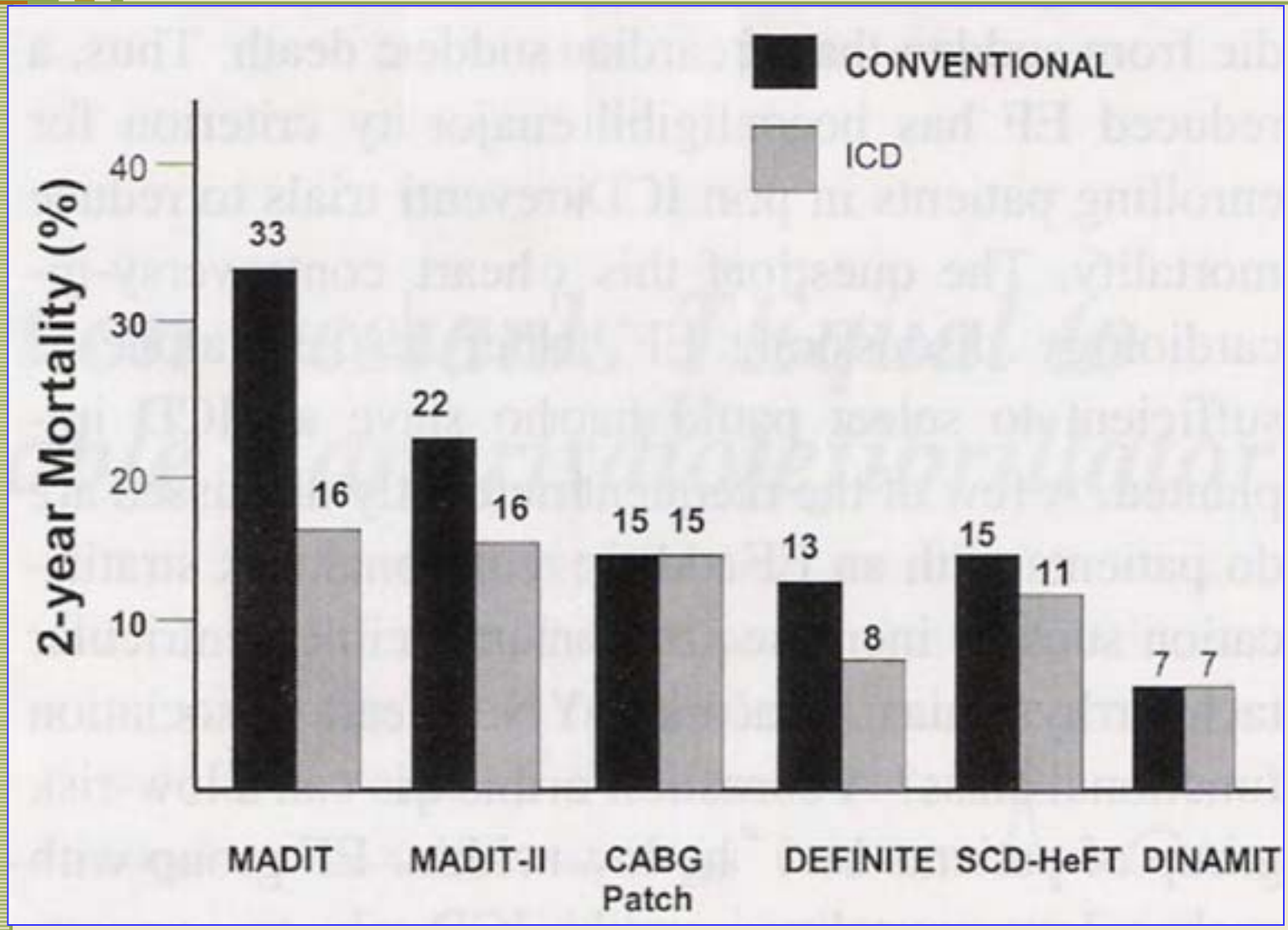
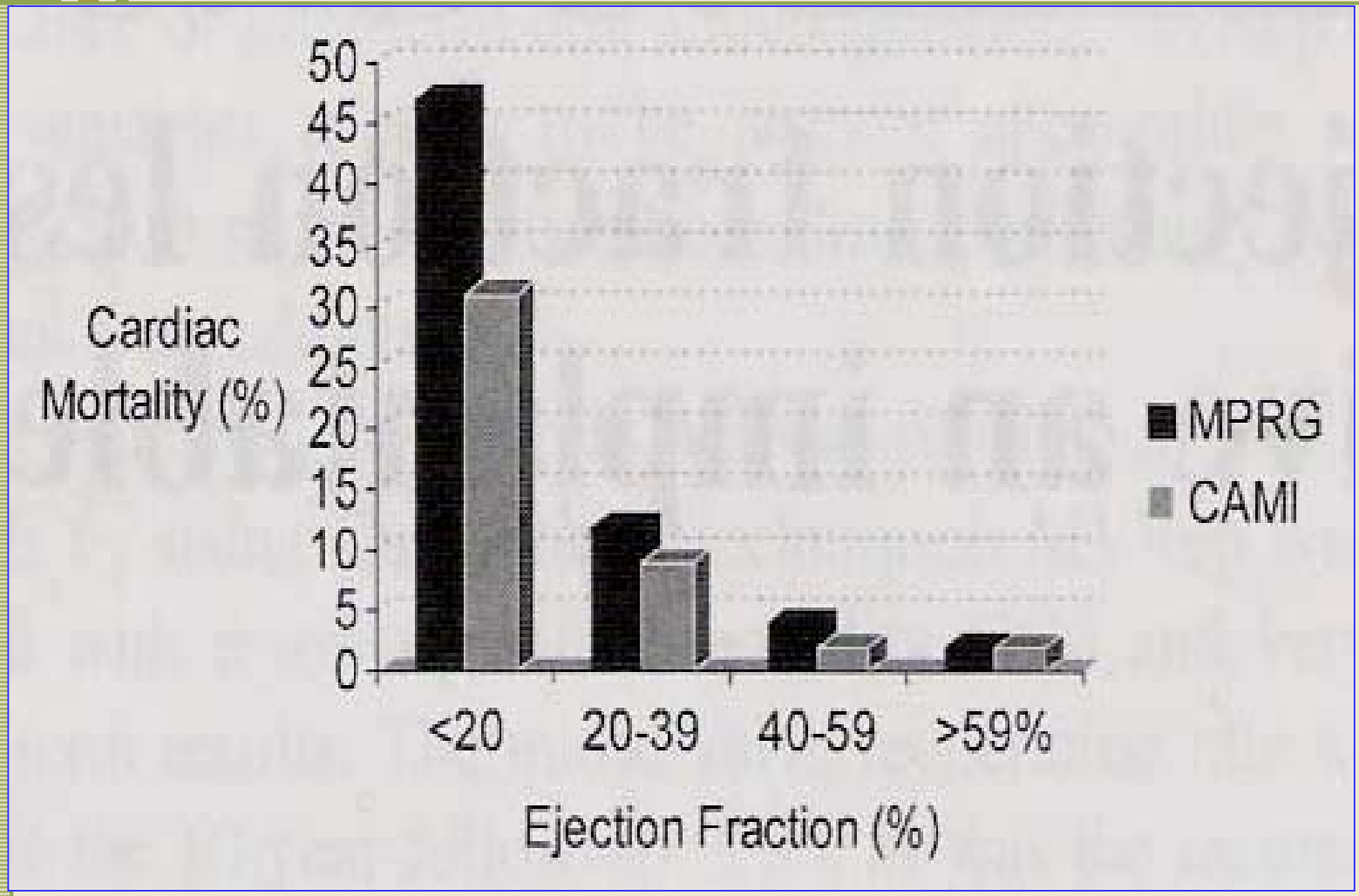

CONVENTIONAL
ICD
2-year Mortality (%)
40
30
20
10
25
18
22
12
22
15
AVID
CASH
CIDS

TABLE 1. Randomized Primary-Prevention ICD Trials

Trial	Date Started; Date Published	No. of Patients	Eligibility	Average Follow-Up, mo
MADIT (ICD vs conventional treatment)[4]	12/27/1990; 12/27/1996	196	Previous MI, EF ≤0.35, NSVT, EPS+	27
MADIT-II (ICD vs. conventional treatment)[9]	07/11/1997; 03/21/2002	1232	Previous MI, EF≤0.30	20
CABG Patch (ICD vs conventional treatment)[5]	08/14/1990; 11/27/1997	900	CAD, abnormal SAECG, CABG surgery	32
DEFINITE (ICD vs conventional treatment)[10]	07/09/1998; 05/10/2004	458	NICM, EF≤0.35, NSVT or >10 PVC/24 h	29
SCD-HeFT (ICD vs placebo)[13]†	09/16/2001; 03/08/2004	1676	I & NICM, EF ≤0.35	48
DINAMIT (ICD vs conventional treatment)[11]	2000; 03/08/2004	674	Within 6–40 d of acute MI, EF ≤0.35, HRV (SDNN) ≤70 ms	30


MADIT
1996
N=196
0.46
CAD, EF≤0.35, NSVT, EP+
MADIT-II
2002
N=1232
0.69
CAD & EF≤0.30
CABG-Patch
1997
N=900
1.07
CABG, EF≤0.35, SAECG+
DEFINITE
2004
N=458
0.65
NICM, EF≤0.35, PVC or NSVT
SCD-HeFT
2004
N=1676
0.77
I&NICM, EF≤0.35
DINAMIT
2004
N=674
1.08
Acute MI, EF≤0.35, ↓HRV
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
ICD Better
Conventional Rx Better

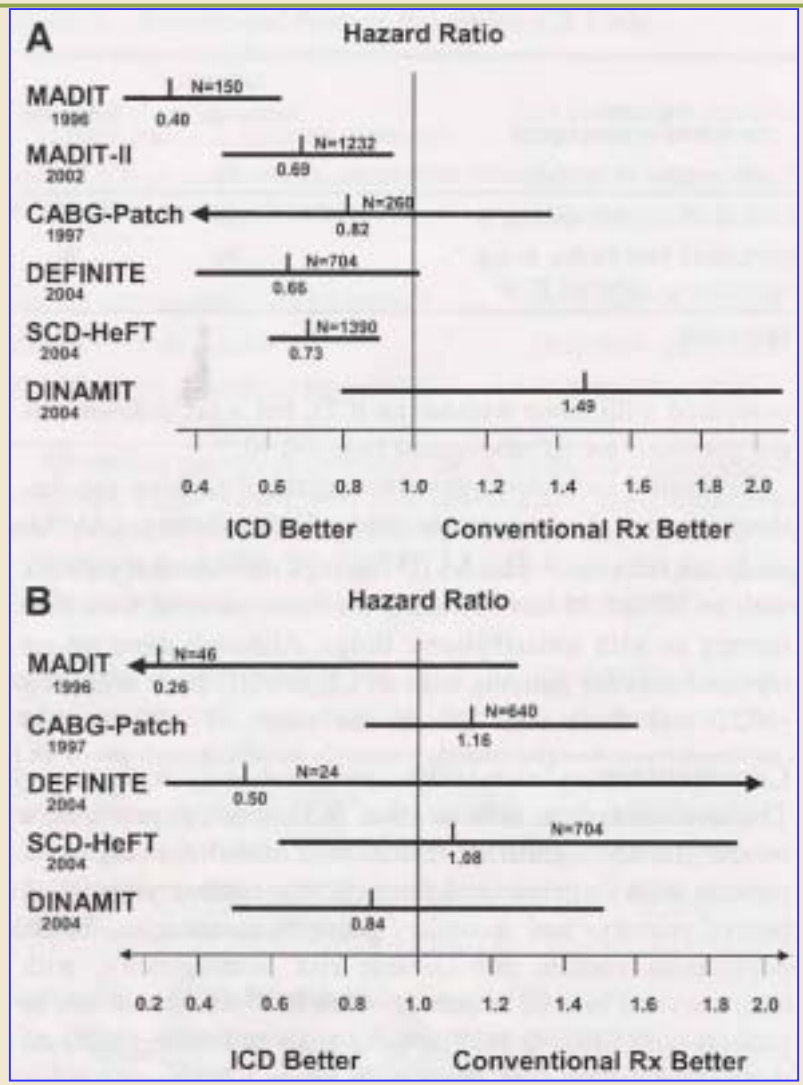

CONVENTIONAL
ICD
2-year Mortality (%)
40
30
20
10
33
16
22
16
15
15
13
8
15
11
7
7
MADIT
MADIT-II
CABG Patch
DEFINITE
SCD-HeFT
DINAMIT


Cardiac Mortality (%)
50
45
40
35
30
25
20
15
10
5
0
<20
20-39
40-59
>59%
Ejection Fraction (%)
MPRG
CAMI

b

LVEF≤30%

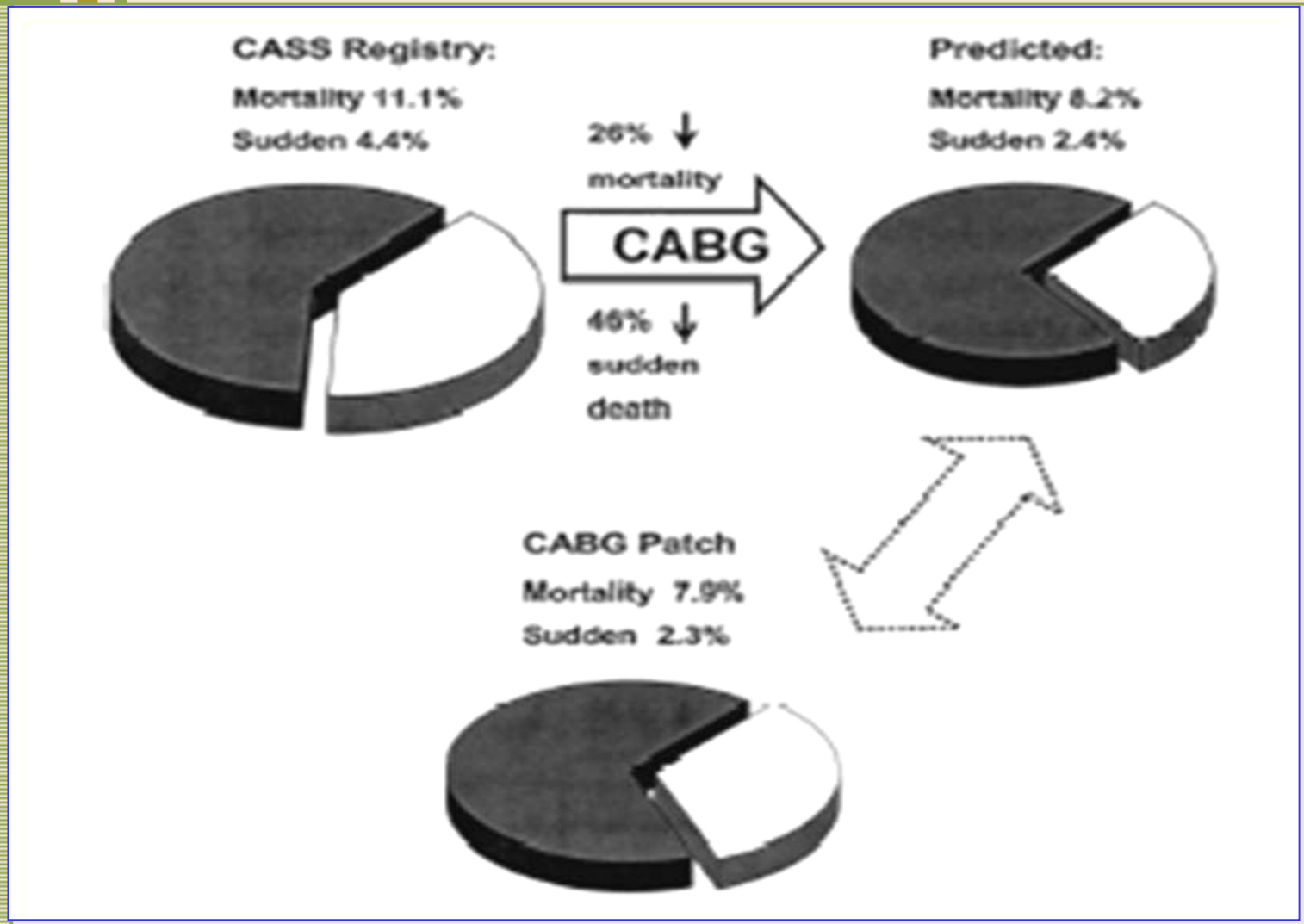
LVEF>30%



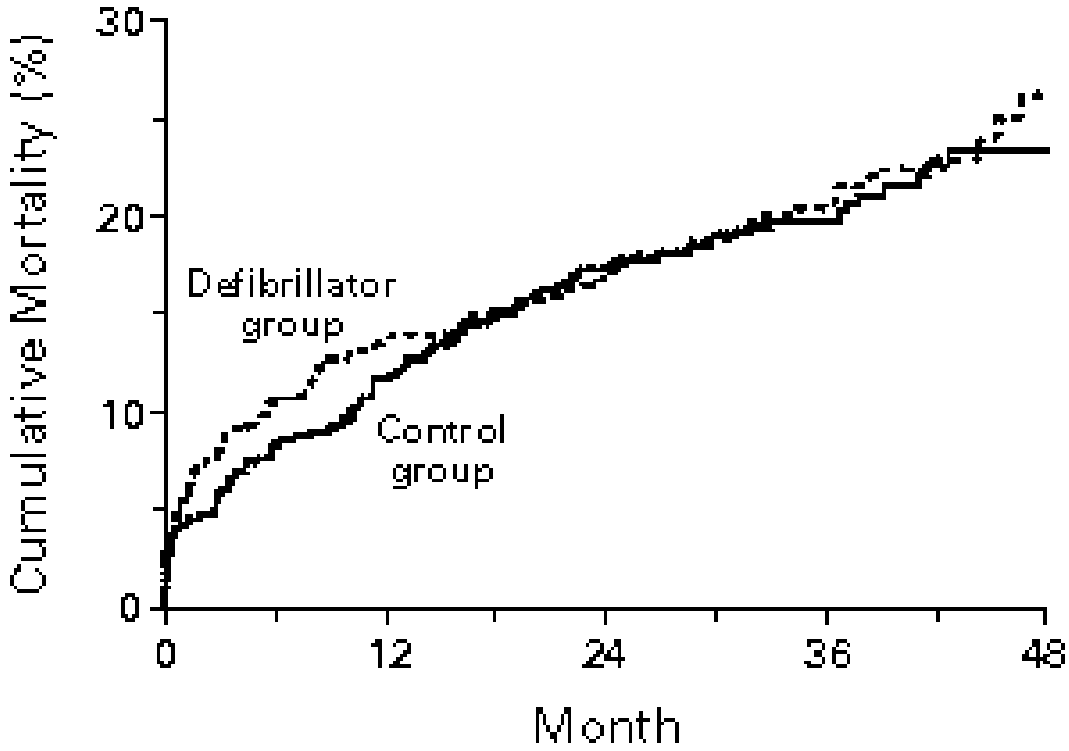
b

TABLE 3. Test Used for Risk Stratification for Sudden Death

Coronary perfusion	
	Coronary angiography
	Exercise testing (including imaging)
	ST-segment changes using ambulatory recordings
Pump function	
	NYHA functional class
	Left ventricular ejection fraction
	Exercise duration
Arrhythmias	
	Long-term ambulatory recordings
	Signal-averaged ECG
	QT-interval duration, dispersion, and dynamic change
	T-wave alternans
	Exercise testing
	Programmed electrical stimulation
Neurohumoral	
	Heart rate variability
	Baroreflex sensitivity
Psychosocial	
	Depression

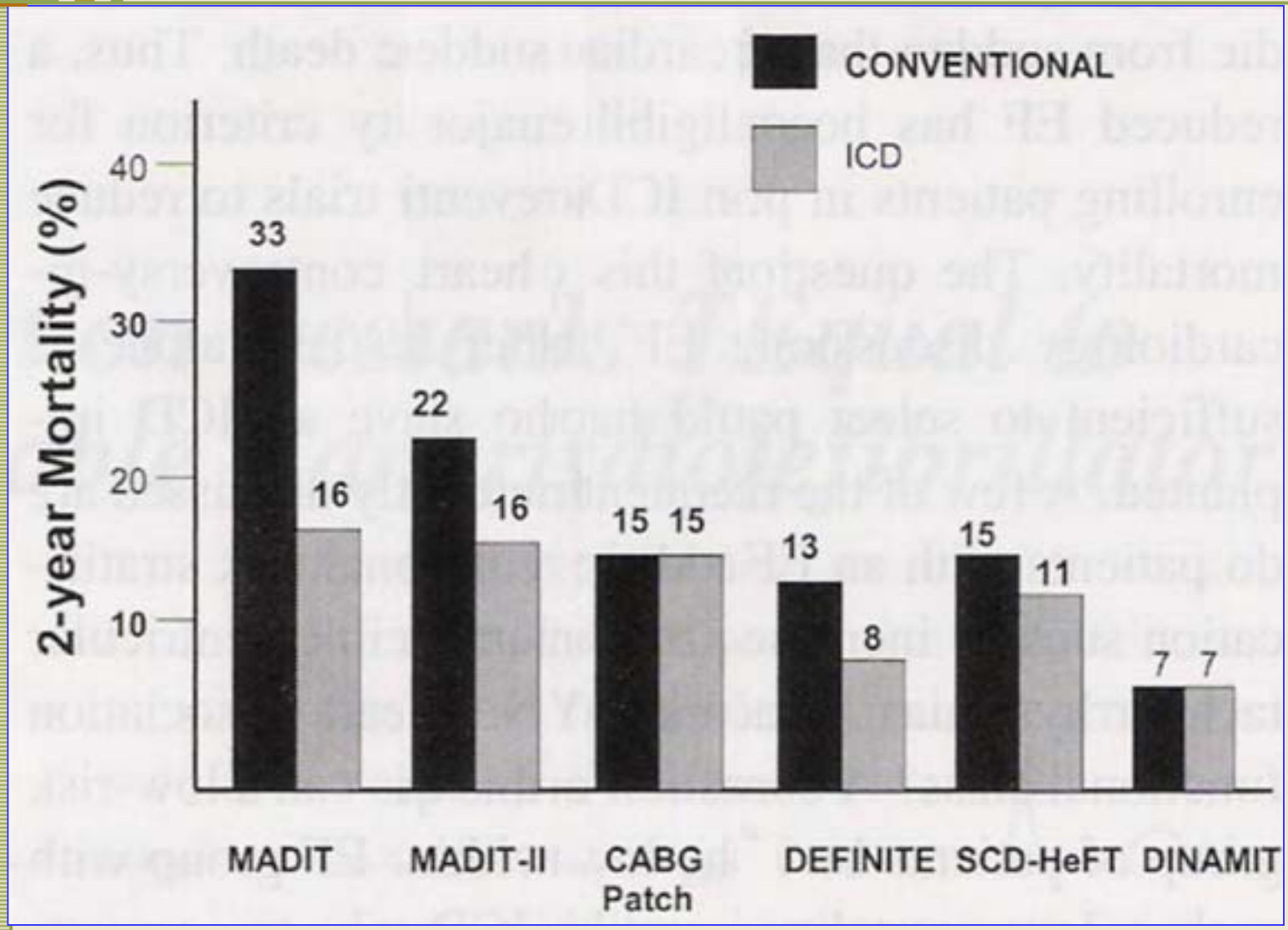

CASS Registry:
Mortality 11.1%
Sudden 4.4%
26% ↓
mortality
CABG
46% ↓
sudden
death
Predicted:
Mortality 8.2%
Sudden 2.4%
CABG Patch
Mortality 7.9%
Sudden 2.3%

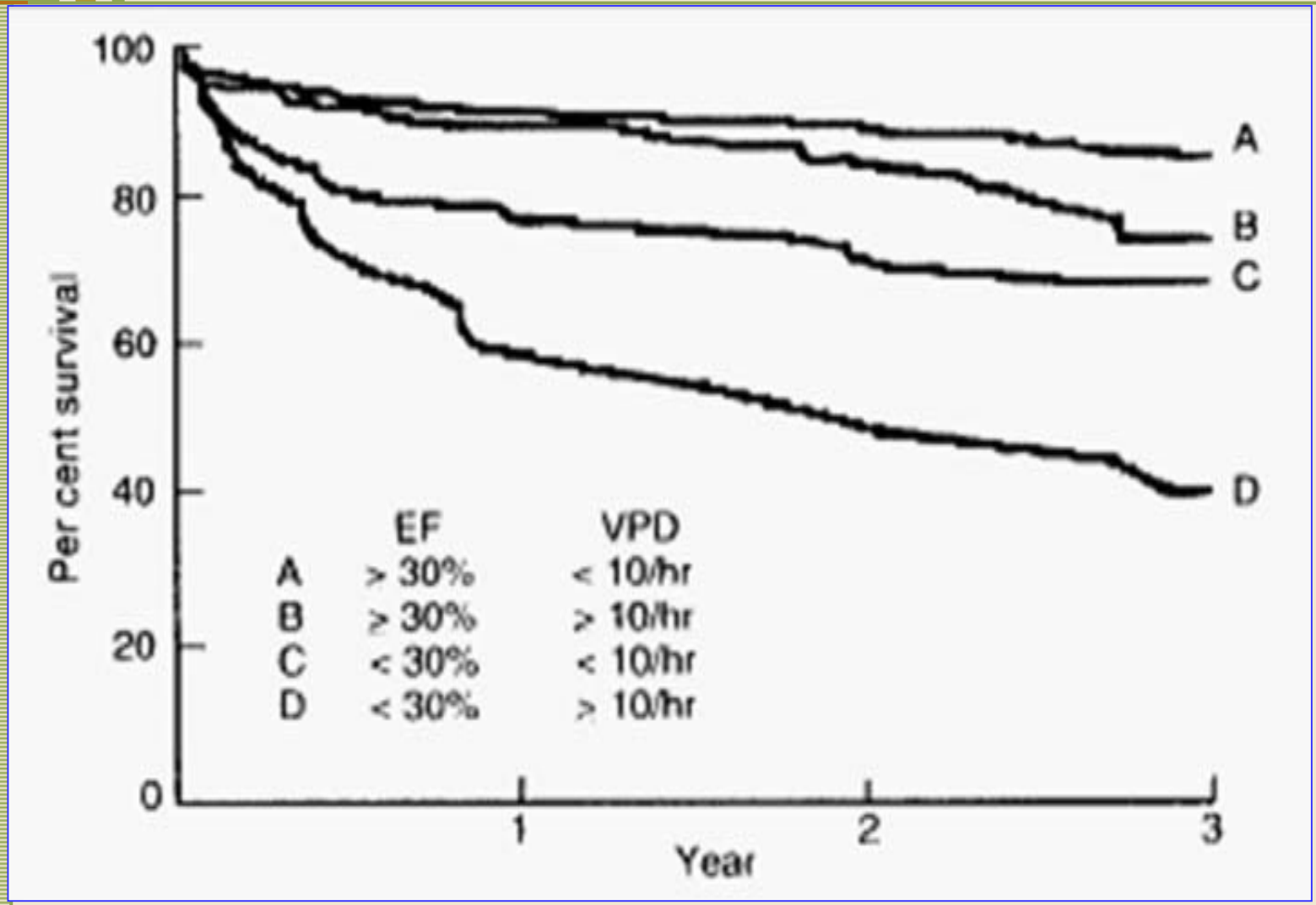
b



Defibrillator group	446	384	313	213	61
Control group	454	399	308	199	57

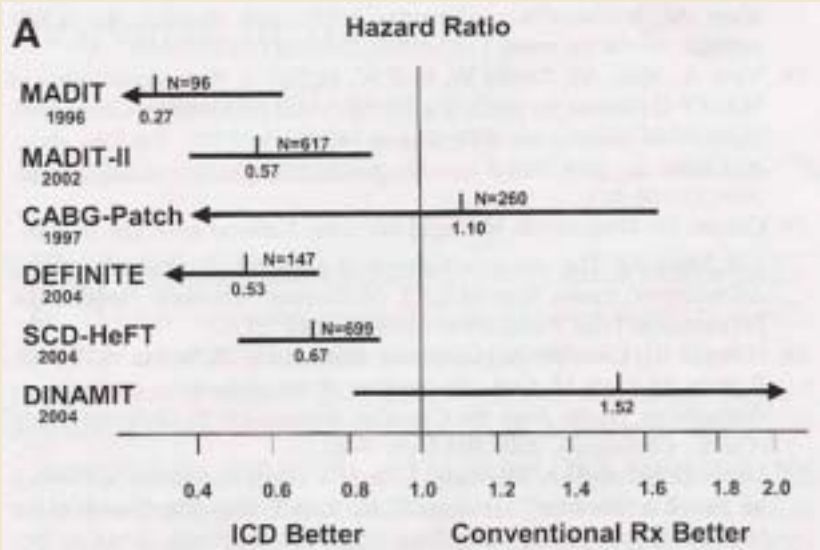
b


CONVENTIONAL
ICD
2-year Mortality (%)
40
30
20
10
33
16
22
16
15 15
13
8
15
11
7 7
MADIT
MADIT-II
CABG Patch
DEFINITE
SCD-HeFT
DINAMIT

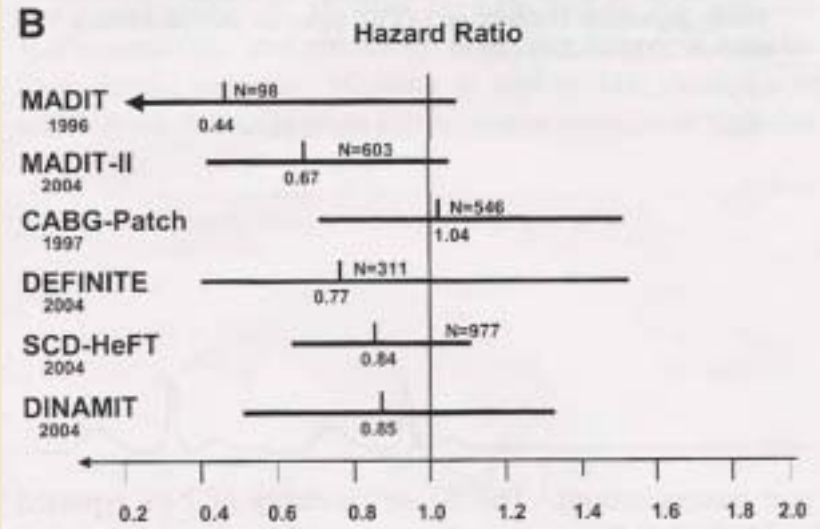

100
80
60
40
20
0
Per cent survival
1
2
3
Year
A
B
C
D
EF
VPD
A > 30% < 10/hr
B ≥ 30% > 10/hr
C < 30% < 10/hr
D < 30% > 10/hr

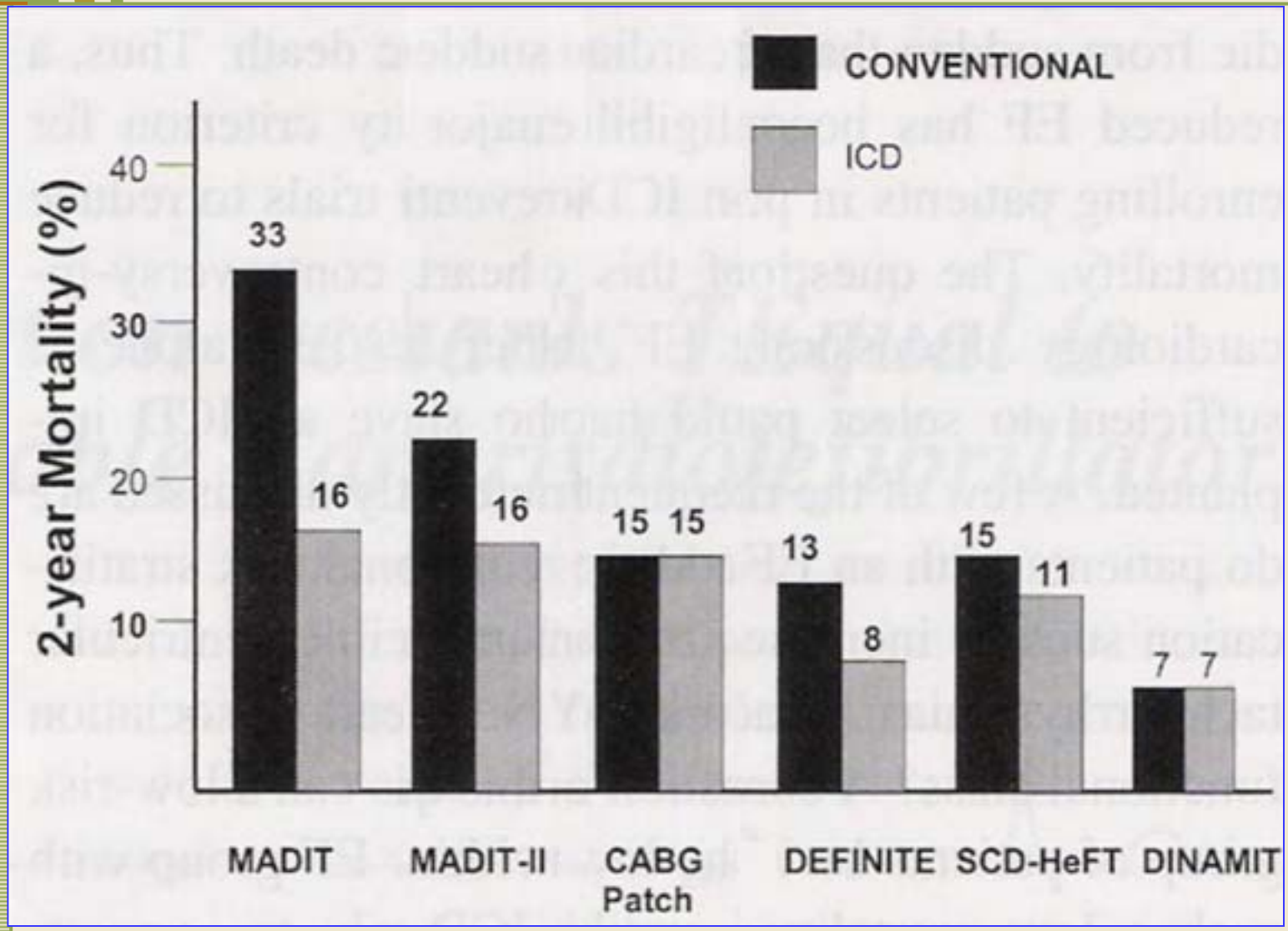
b

QRS≥120ms

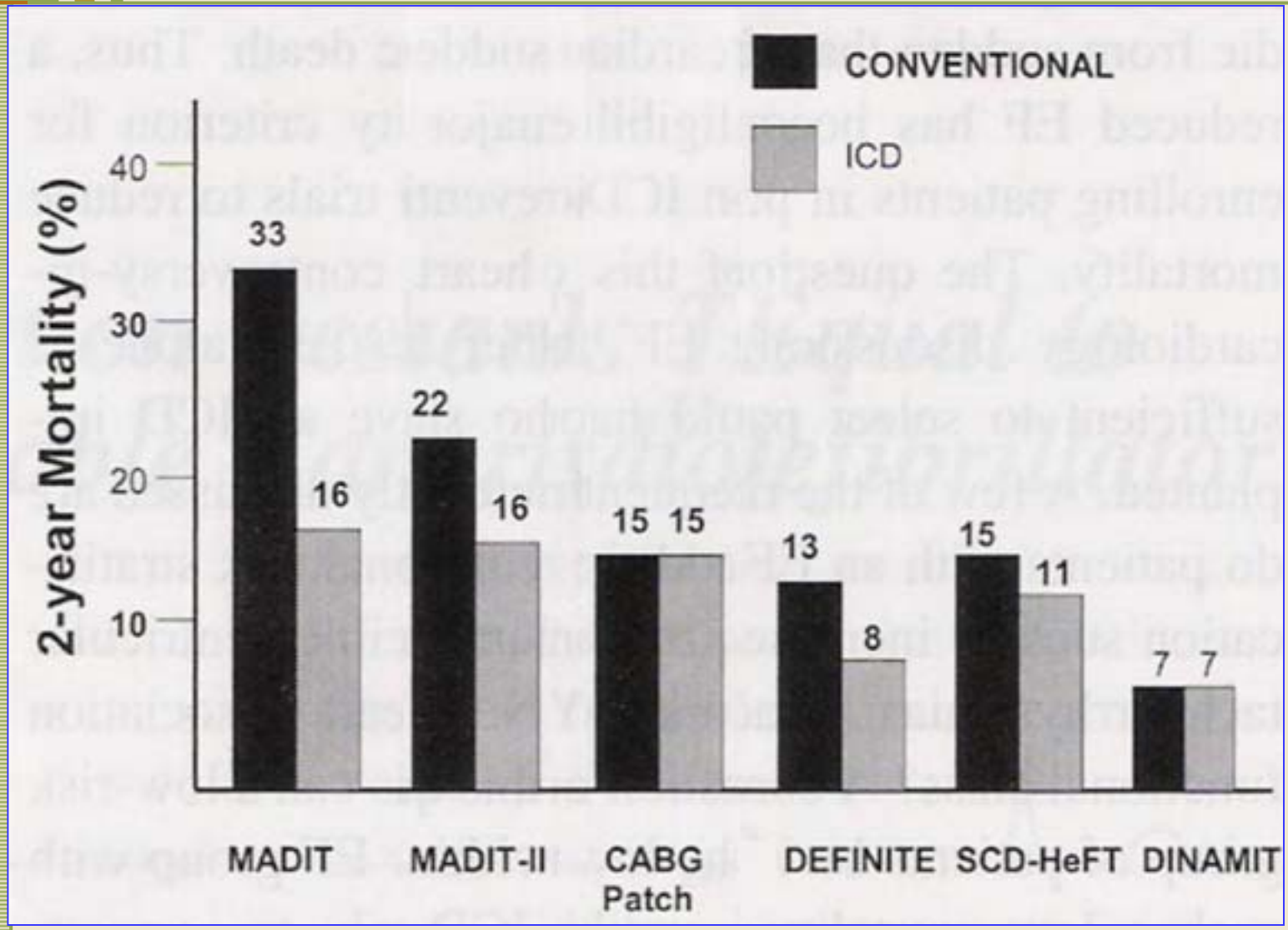


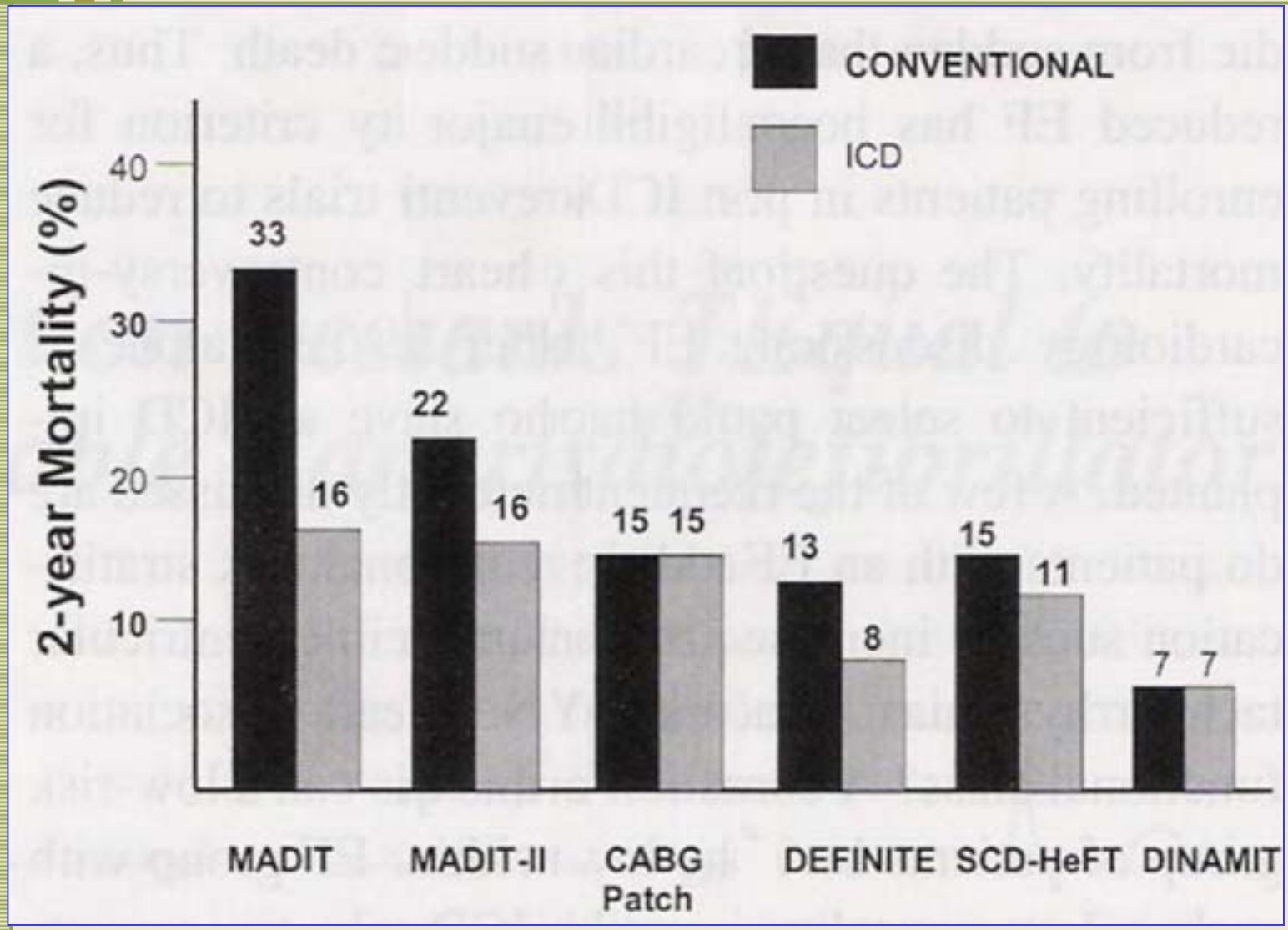
QRS<120ms

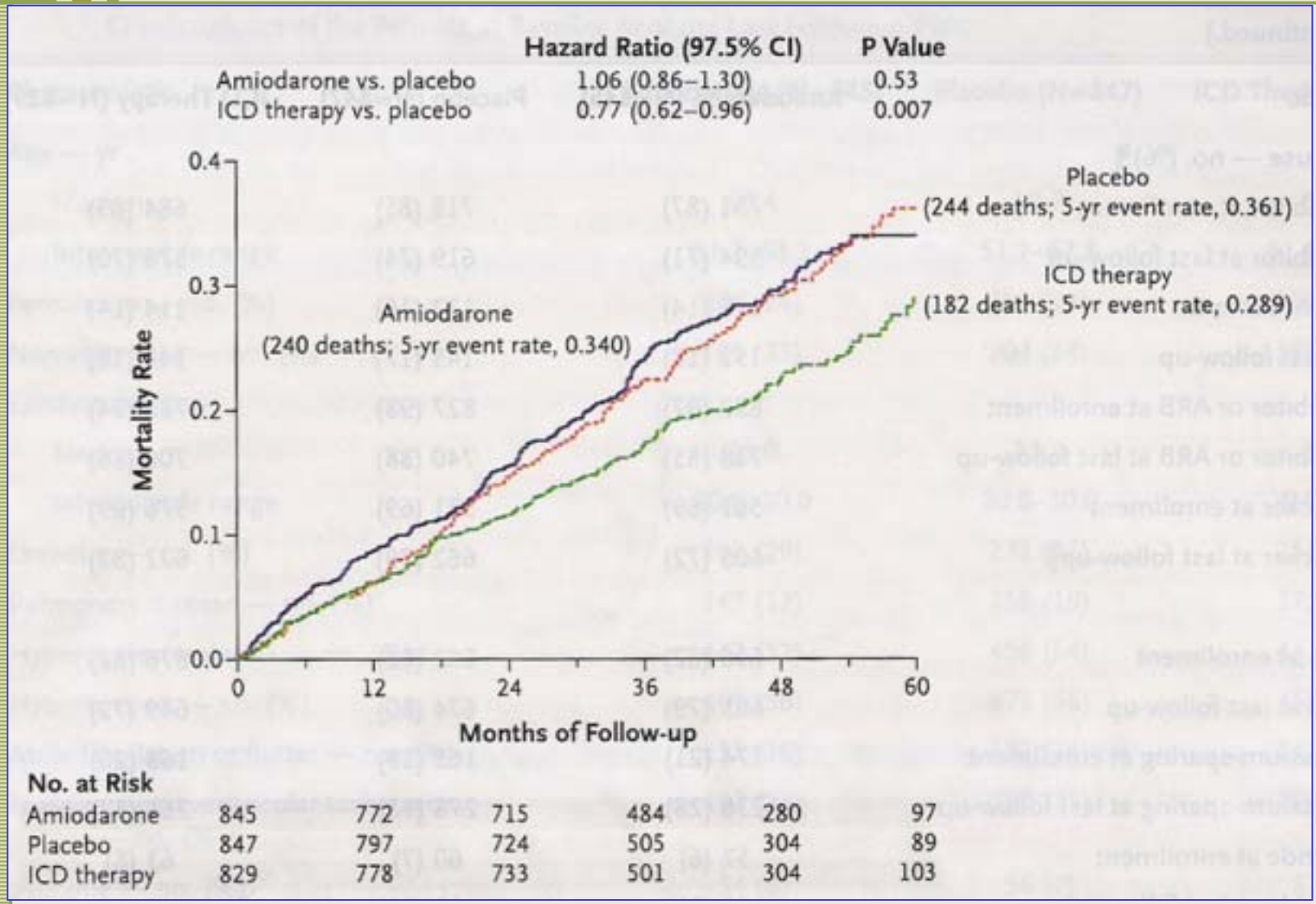


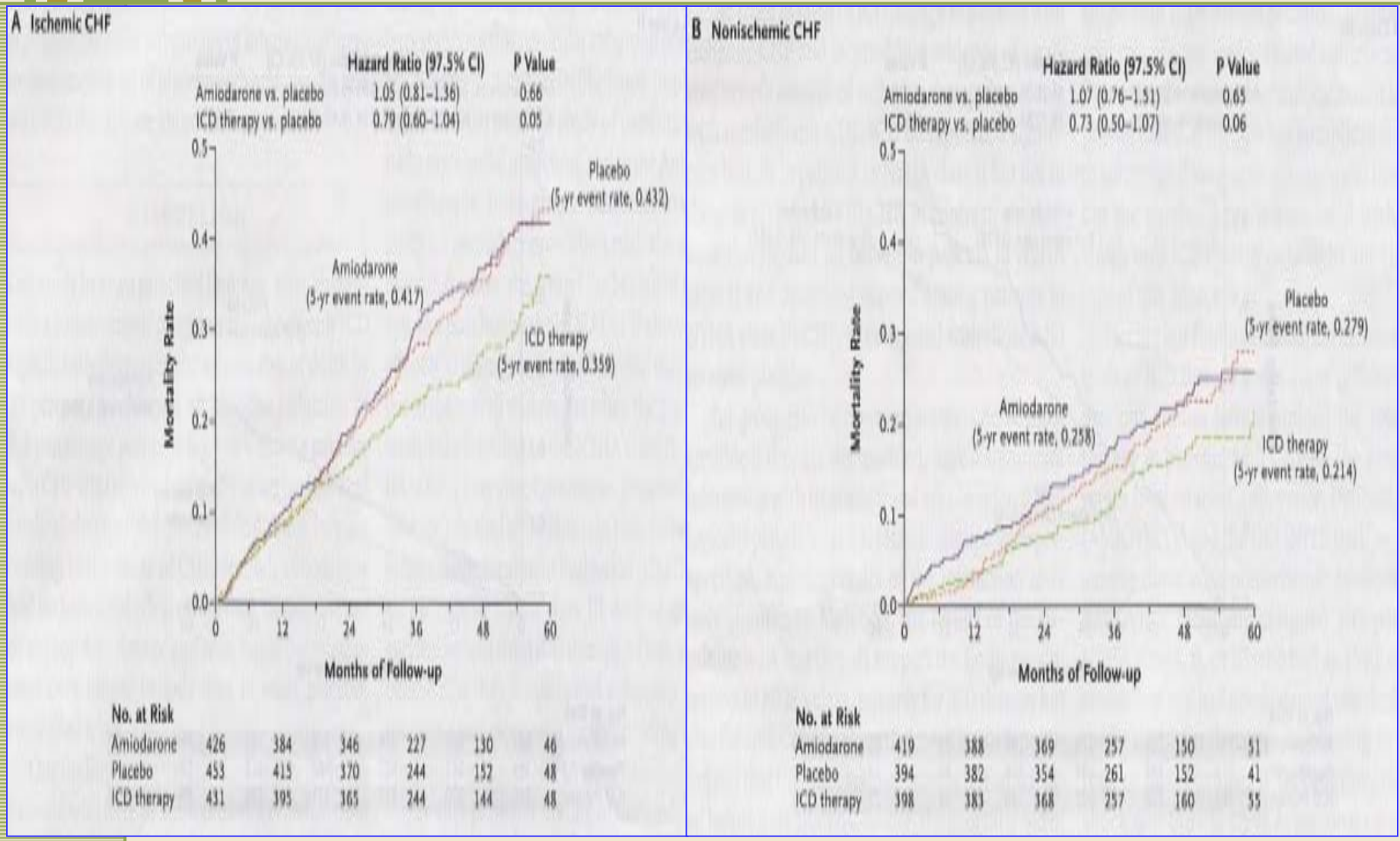

CONVENTIONAL
ICD
2-year Mortality (%)
40
30
20
10
33
16
22
16
15
15
13
8
15
11
7
7
MADIT
MADIT-II
CABG Patch
DEFINITE
SCD-HeFT
DINAMIT

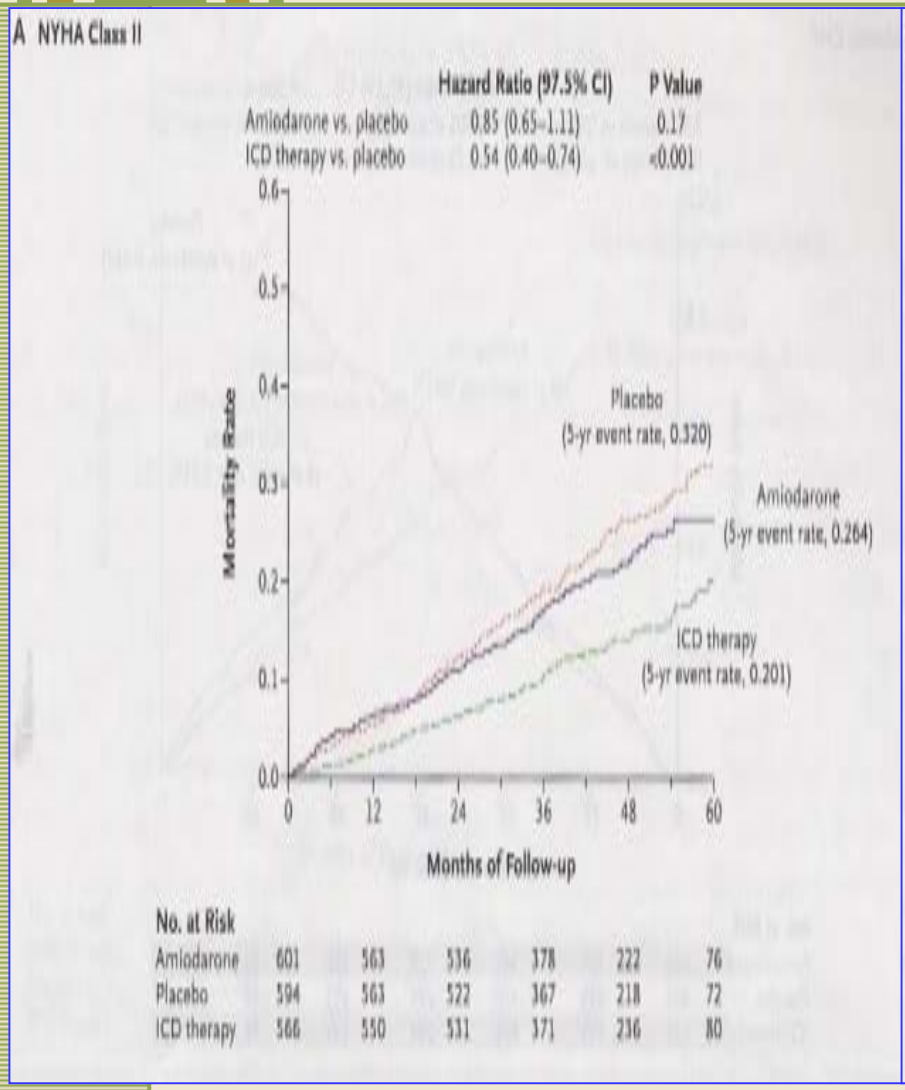
b

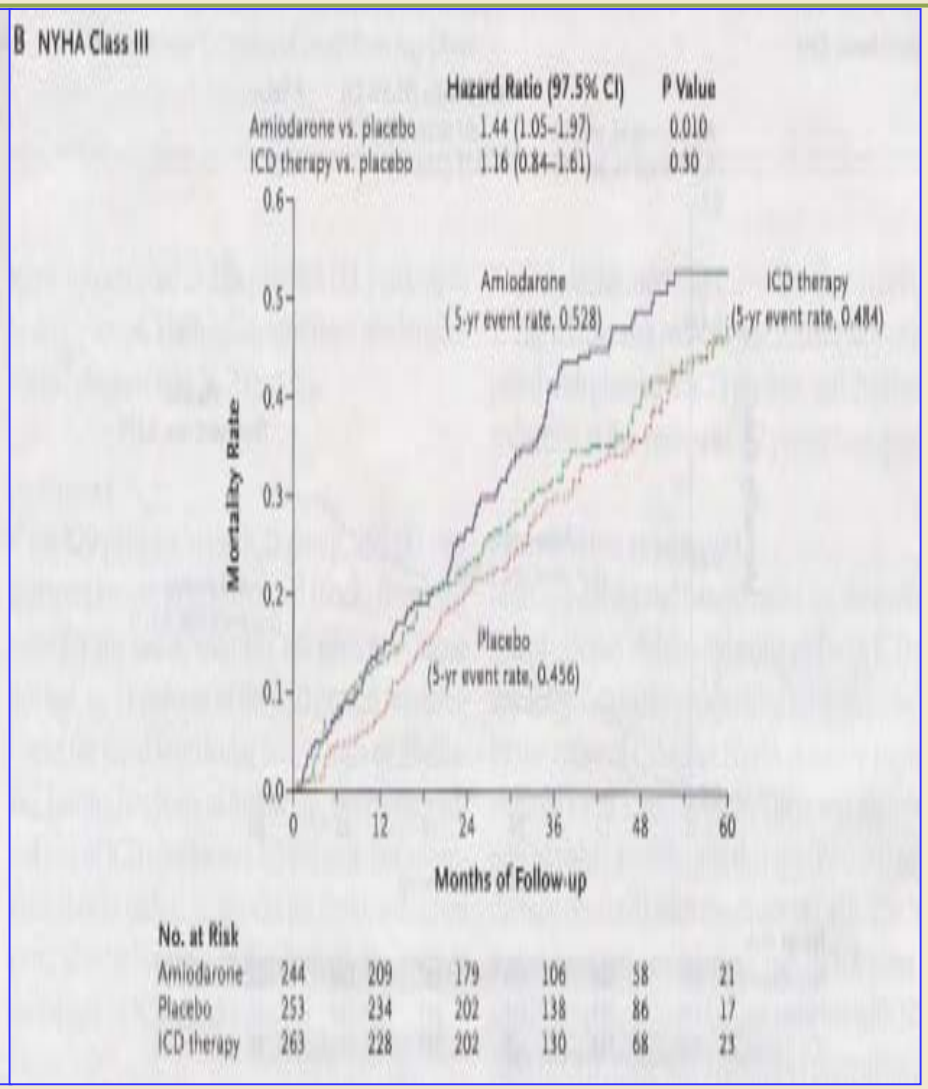

CONVENTIONAL
ICD
2-year Mortality (%)
40
30
20
10
33
16
22
16
15 15
13
8
15
11
7 7
MADIT
MADIT-II
CABG Patch
DEFINITE
SCD-HeFT
DINAMIT


CONVENTIONAL
ICD
2-year Mortality (%)
40
30
20
10
33
16
22
16
15
15
13
8
15
11
7
7
MADIT
MADIT-II
CABG Patch
DEFINITE
SCD-HeFT
DINAMIT

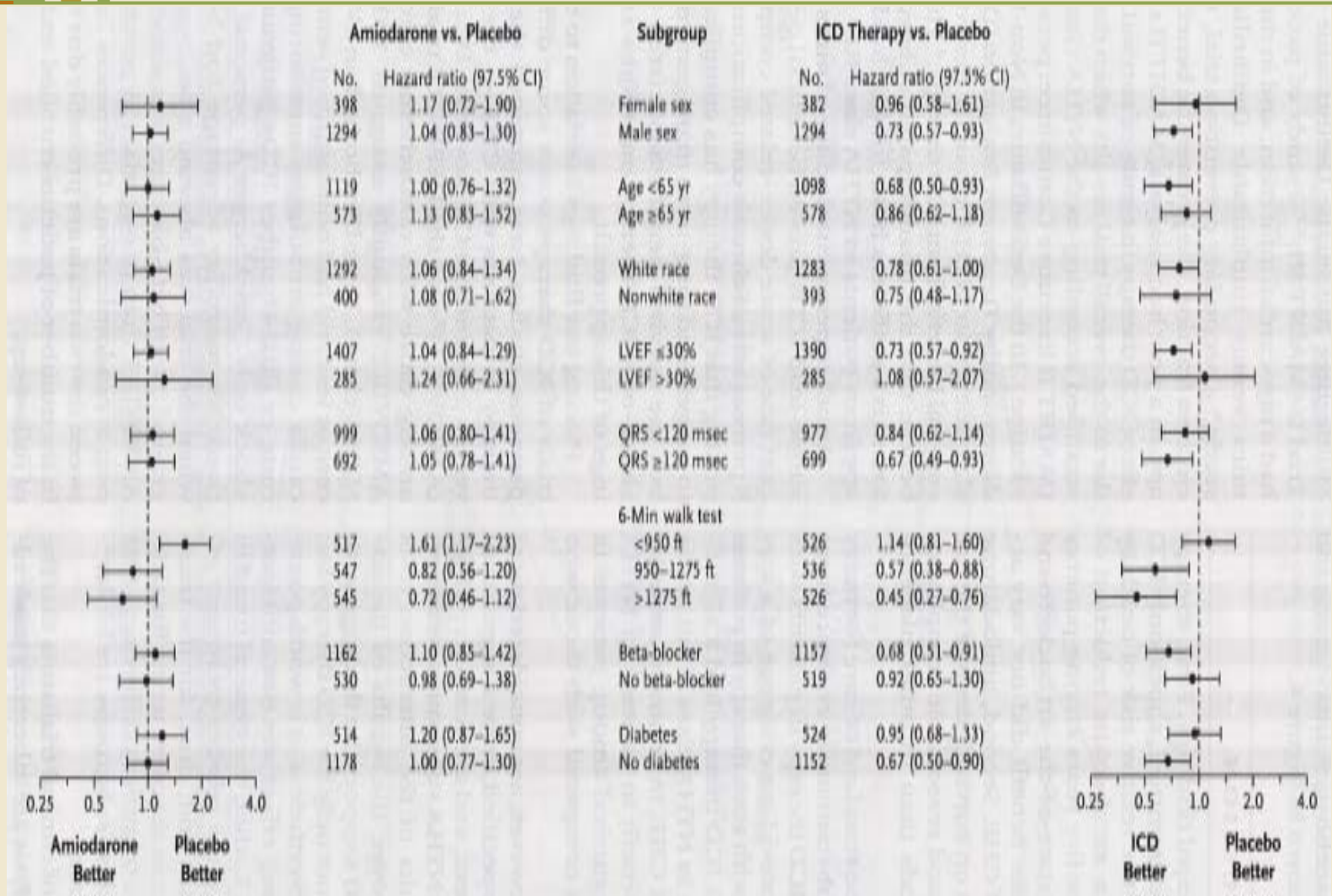

Hazard Ratio (97.5% CI)
P Value
Amiodarone vs. placebo
1.06 (0.86–1.30)
0.53
ICD therapy vs. placebo
0.77 (0.62–0.96)
0.007
Placebo
(244 deaths; 5-yr event rate, 0.361)
ICD therapy
(182 deaths; 5-yr event rate, 0.289)
Amiodarone
(240 deaths; 5-yr event rate, 0.340)
Mortality Rate
0.0
0.1
0.2
0.3
0.4
0
12
24
36
48
60
Months of Follow-up
No. at Risk
Amiodarone 845 772 715 484 280 97
Placebo 847 797 724 505 304 89
ICD therapy 829 778 733 501 304 103


A Ischemic CHF
Hazard Ratio (97.5% CI)
P Value
Amiodarone vs. placebo
1.05 (0.81–1.36)
0.66
ICD therapy vs. placebo
0.79 (0.60–1.04)
0.05
Placebo
(5-yr event rate, 0.432)
Amiodarone
(5-yr event rate, 0.417)
ICD therapy
(5-yr event rate, 0.359)
Mortality Rate
0.0
0.1
0.2
0.3
0.4
0.5
0
12
24
36
48
60
Months of Follow-up
No. at Risk
Amiodarone 426 384 346 227 130 46
Placebo 453 415 370 244 152 48
ICD therapy 431 395 365 244 144 48
B Nonischemic CHF
Hazard Ratio (97.5% CI)
P Value
Amiodarone vs. placebo
1.07 (0.76–1.51)
0.65
ICD therapy vs. placebo
0.73 (0.50–1.07)
0.06
Placebo
(5-yr event rate, 0.279)
Amiodarone
(5-yr event rate, 0.258)
ICD therapy
(5-yr event rate, 0.214)
Mortality Rate
0.0
0.1
0.2
0.3
0.4
0.5
0
12
24
36
48
60
Months of Follow-up
No. at Risk
Amiodarone 419 388 369 257 150 51
Placebo 394 382 354 261 152 41
ICD therapy 398 383 368 257 160 55


A NYHA Class II
Hazard Ratio (97.5% CI)
P Value
Amiodarone vs. placebo
0.85 (0.65–1.11)
0.17
ICD therapy vs. placebo
0.54 (0.40–0.74)
<0.001
Mortality Rate
Placebo
(5-yr event rate, 0.320)
Amiodarone
(5-yr event rate, 0.264)
ICD therapy
(5-yr event rate, 0.201)
Months of Follow-up
No. at Risk
Amiodarone 601 563 536 378 222 76
Placebo 594 563 522 367 218 72
ICD therapy 566 550 531 371 236 80


B NYHA Class III
Hazard Ratio (97.5% CI)
P Value
Amiodarone vs. placebo
1.44 (1.05–1.97)
0.010
ICD therapy vs. placebo
1.16 (0.84–1.61)
0.30
Mortality Rate
Amiodarone
(5-yr event rate, 0.528)
ICD therapy
(5-yr event rate, 0.484)
Placebo
(5-yr event rate, 0.456)
Months of Follow-up
No. at Risk
Amiodarone 244 209 179 106 58 21
Placebo 253 234 202 138 86 17
ICD therapy 263 228 202 130 68 23

b


Amiodarone vs. Placebo
Subgroup
ICD Therapy vs. Placebo
No. Hazard ratio (97.5% CI)
No. Hazard ratio (97.5% CI)
398 1.17 (0.72–1.90) Female sex 382 0.96 (0.58–1.61)
1294 1.04 (0.83–1.30) Male sex 1294 0.73 (0.57–0.93)
1119 1.00 (0.76–1.32) Age <65 yr 1098 0.68 (0.50–0.93)
573 1.13 (0.83–1.52) Age ≥65 yr 578 0.86 (0.62–1.18)
1292 1.06 (0.84–1.34) White race 1283 0.78 (0.61–1.00)
400 1.08 (0.71–1.62) Nonwhite race 393 0.75 (0.48–1.17)
1407 1.04 (0.84–1.29) LVEF ≤30% 1390 0.73 (0.57–0.92)
285 1.24 (0.66–2.31) LVEF >30% 285 1.08 (0.57–2.07)
999 1.06 (0.80–1.41) QRS <120 msec 977 0.84 (0.62–1.14)
692 1.05 (0.78–1.41) QRS ≥120 msec 699 0.67 (0.49–0.93)
6-Min walk test
517 1.61 (1.17–2.23) <950 ft 526 1.14 (0.81–1.60)
547 0.82 (0.56–1.20) 950–1275 ft 536 0.57 (0.38–0.88)
545 0.72 (0.46–1.12) >1275 ft 526 0.45 (0.27–0.76)
1162 1.10 (0.85–1.42) Beta-blocker 1157 0.68 (0.51–0.91)
530 0.98 (0.69–1.38) No beta-blocker 519 0.92 (0.65–1.30)
514 1.20 (0.87–1.65) Diabetes 524 0.95 (0.68–1.33)
1178 1.00 (0.77–1.30) No diabetes 1152 0.67 (0.50–0.90)
0.25 0.5 1.0 2.0 4.0
Amiodarone Better
Placebo Better
0.25 0.5 1.0 2.0 4.0
ICD Better
Placebo Better