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My ESC in Marocco

Ventricular Arrhythmias

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Relationship disclosure

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- *Research Grants:*

Biotronik; Boston Scientific; Medtronic; Saint Jude Medical; Sorin Group;

- *Honoraria / Travel Grants for Lectures:*

Biotronik; Boston Scientific; Medtronic; Saint Jude Medical; Sorin Group; Spectranetics; Boehringer Ingelheim; Sanofi; Meda Pharma; Bayer

- *Consultant :*

Medtronic; Spectranetics

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Primary prevention by the ICD

LVEF ≤ 35%
NYHA II – III
OMT > 3 mo.

Ischemic CM	Non ischemic CM

I	I

Implantable cardioverter defibrillator in patients with left ventricular dysfunction

Recommendations	Class[a]	Level[b]	Ref.[c]
ICD therapy is recommended to reduce SCD in patients with symptomatic HF (NYHA class II–III) and LVEF ≤35% after ≥3 months of optimal medical therapy who are expected to survive for at least 1 year with good functional status:			
– Ischaemic aetiology (at least 6 weeks after myocardial infarction).	I	A	63,64
– Non-ischaemic aetiology.	I	B	64,316, 317

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doi:10.1093/eurheartj/eht150

2015 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

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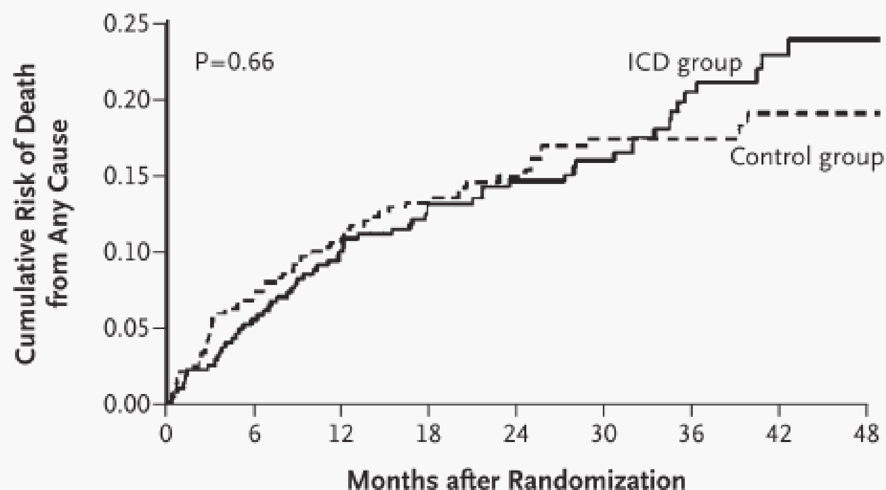
ICD implantation for the primary prevention of SCD is generally not indicated <40 days after myocardial infarction.	III	A



No. at Risk								
ICD group	315	299	258	211	172	123	82	25
Control group	318	305	272	217	172	124	79	31

Figure 1. Kaplan–Meier Estimates of the Cumulative Risk of Death from Any Cause, According to Study Group.

ICD denotes implantable cardioverter–defibrillator.

DINAMIT trial, Hohnloser NEJM 2004

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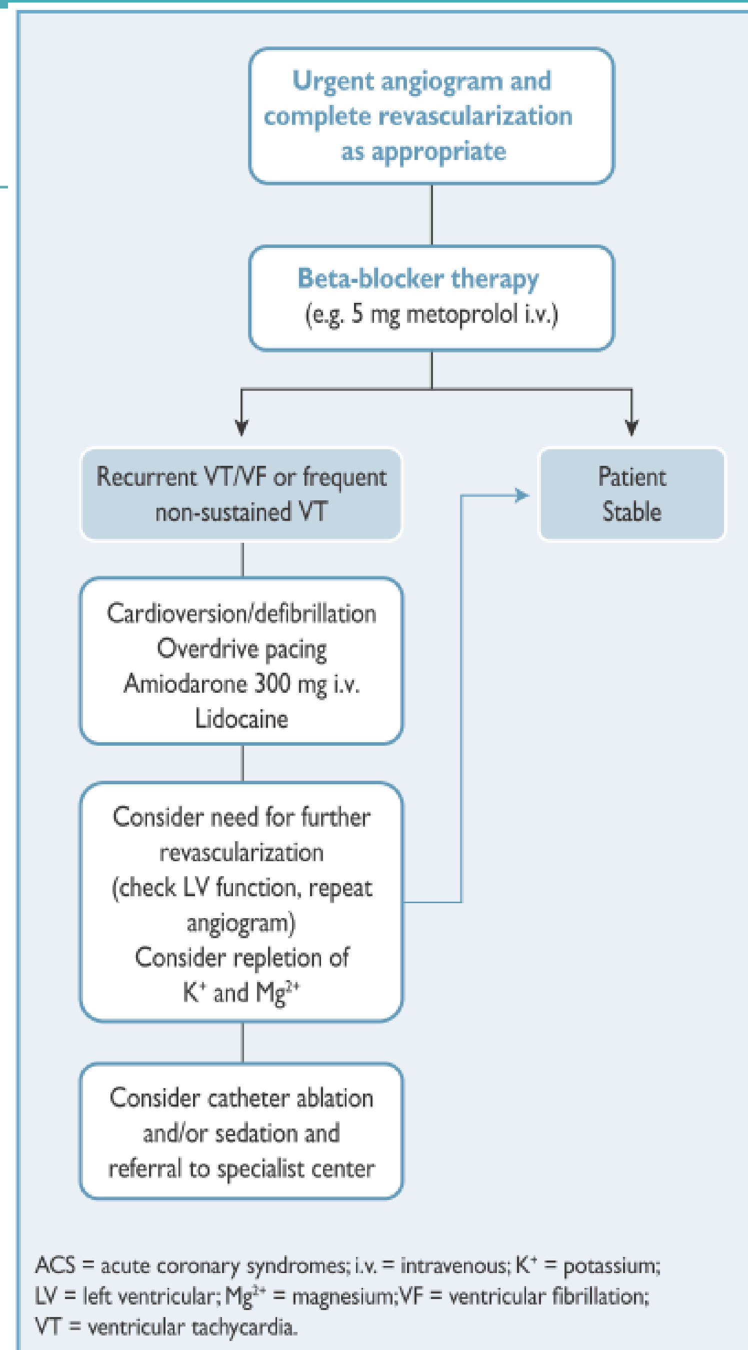
5.1.2 Prevention and management of sudden cardiac death associated with acute coronary syndromes: pre-hospital phase



ACS = acute coronary syndromes; i.v. = intravenous; K^+ = potassium; LV = left ventricular; Mg^{2+} = magnesium; VF = ventricular fibrillation; VT = ventricular tachycardia.

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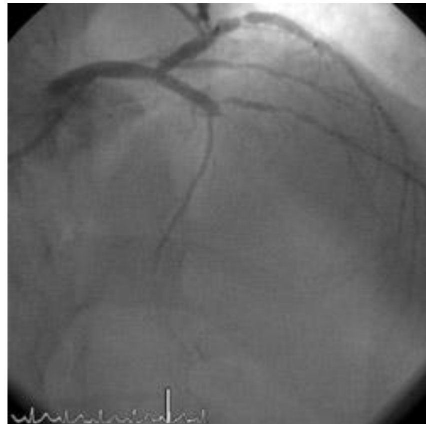
5.1.2 Prevention and management of sudden cardiac death associated with acute coronary syndromes: pre-hospital phase



1 - Reperfusion

Recommendations	Class[a]	Level[b]
Urgent reperfusion is recommended in patients with STEMI.	I	A
Coronary revascularization is recommended in patients with NSTEMI or unstable angina according to the ESC NSTEMI guidelines.	I	C
A coronary angiogram followed, if necessary, by coronary angioplasty within 2 h of hospital admission is recommended in patients with high-risk NSTEMI, which also includes life-threatening VA.	I	C
Prompt and complete coronary revascularization is recommended to treat myocardial ischaemia that may be present in patients with recurrent VT or VF.	I	C
Prompt opening of the infarct vessels is recommended to reverse new-onset ischaemic AV conduction disturbances. This is especially true for AV block due to inferior infarction, even in the case of late (>12 h) presentation.	I	C

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5.1.2 Prevention and management of sudden cardiac death associated with acute coronary syndromes: pre-hospital phase

Recommendations	Class[a]	Level[b]
Beta-blocker treatment is recommended for recurrent polymorphic VT.	I	B
Intravenous amiodarone is recommended for the treatment of polymorphic VT.	I	C
Immediate electrical cardioversion or defibrillation is recommended in patients with sustained VT or VF.	I	C
Urgent coronary angiography followed, when indicated, by revascularization is recommended in patients with recurrent VT or VF when myocardial ischaemia cannot be excluded.	I	C

2 – Bêta bloquants & Amiodarone ± Lidocaine

5.1.2 Prevention and management of sudden cardiac death associated with acute coronary syndromes: pre-hospital phase

Recommendation	Class	Level
Correction of electrolyte imbalances is recommended in patients with recurrent VT or VF.	I	C

3 – Rééquilibration hydro-électrolytique
Lidocaine

Recommendation	Class	Level
Intravenous lidocaine may be considered for the treatment of recurrent sustained VT or VF not responding to beta-blockers or amiodarone or in the presence of contraindications to amiodarone.	IIb	C

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5.1.2 Prevention and management of sudden cardiac death associated with acute coronary syndromes: pre-hospital phase

4 – Ablation

Recommendation	Class	Level
Radiofrequency catheter ablation at a specialized ablation centre followed by the implantation of an ICD should be considered in patients with recurrent VT, VF or electrical storms despite complete revascularization and optimal medical treatment.	IIa	C
Transvenous catheter overdrive stimulation should be considered if VT is frequently recurrent despite use of anti-arrhythmic drugs and catheter ablation is not possible.	IIa	C

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Catheter ablation

Substrate
Voltage map / Abnormal potentials

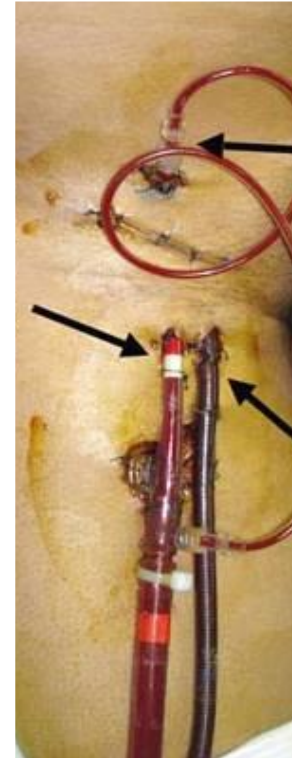
VT Induction attempt

Non reproductible

Unstable

Poorly tolerated

General anesthesia



Hemodynamic support

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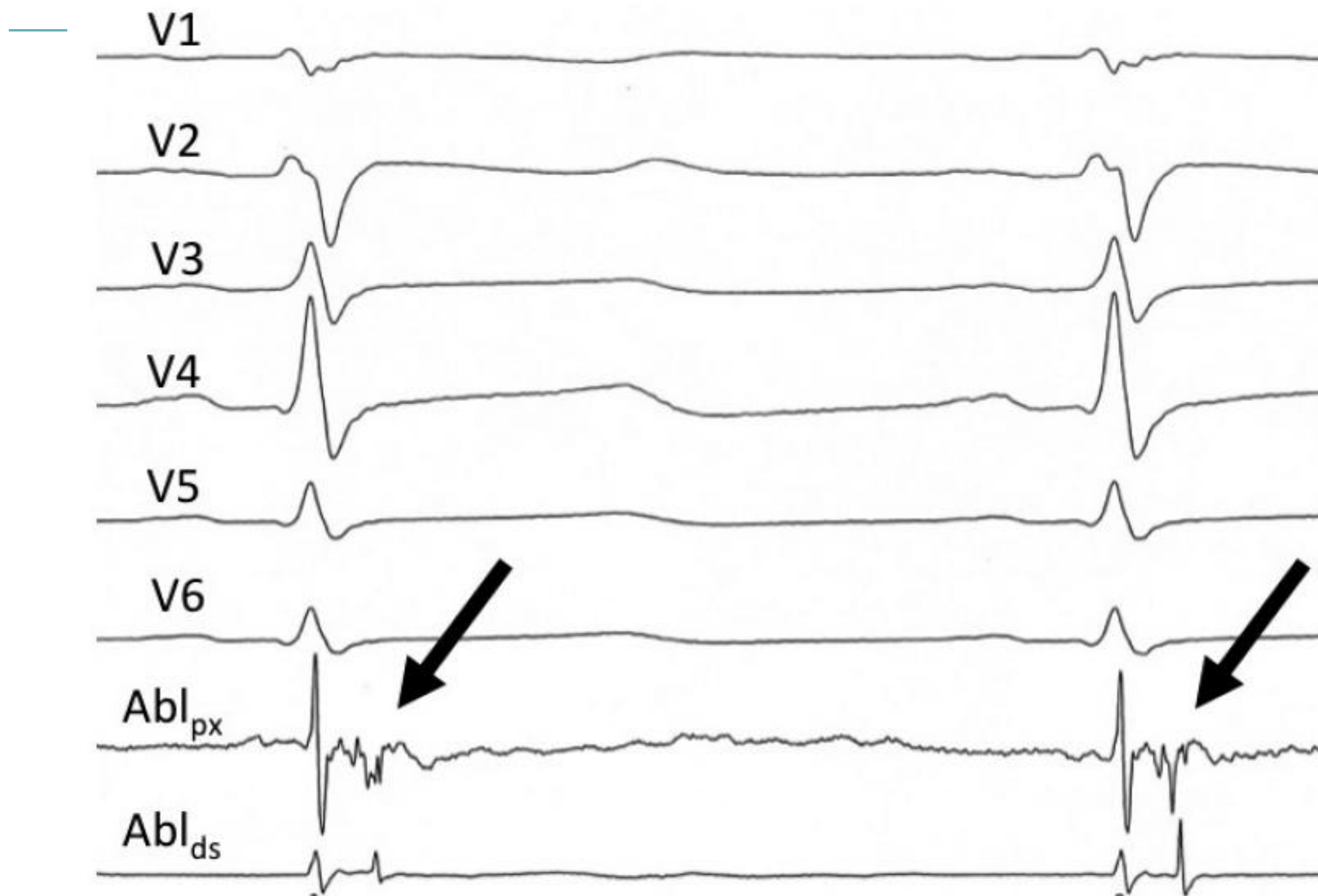

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Study Map Point Catheter ECG Display Imaging Tools Help

2-Map (412, 0)

0.13 mV 6.21 mV

0.52 1.52

Bipolar

R

1.34

Volume: 370.27 RAO: 163 °

Caudal: 10 ° Swivel: -21 °

AP PA LAO RAO LL RL INF SUP

452 CL -167 LAT 0.14 Bi N/A Imp Loc

200.0 mm/sec

R V1

0.44 [mV]

M MAP 1-2

-200

200

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Recommendation	Class	Level
ICD implantation or temporary use of a WCD may be considered <40 days after myocardial infarction in selected patients (incomplete revascularization,[d] pre-existing LVEF dysfunction, occurrence of arrhythmias >48 h after the onset of ACS, polymorphic VT or VF).	IIb	C

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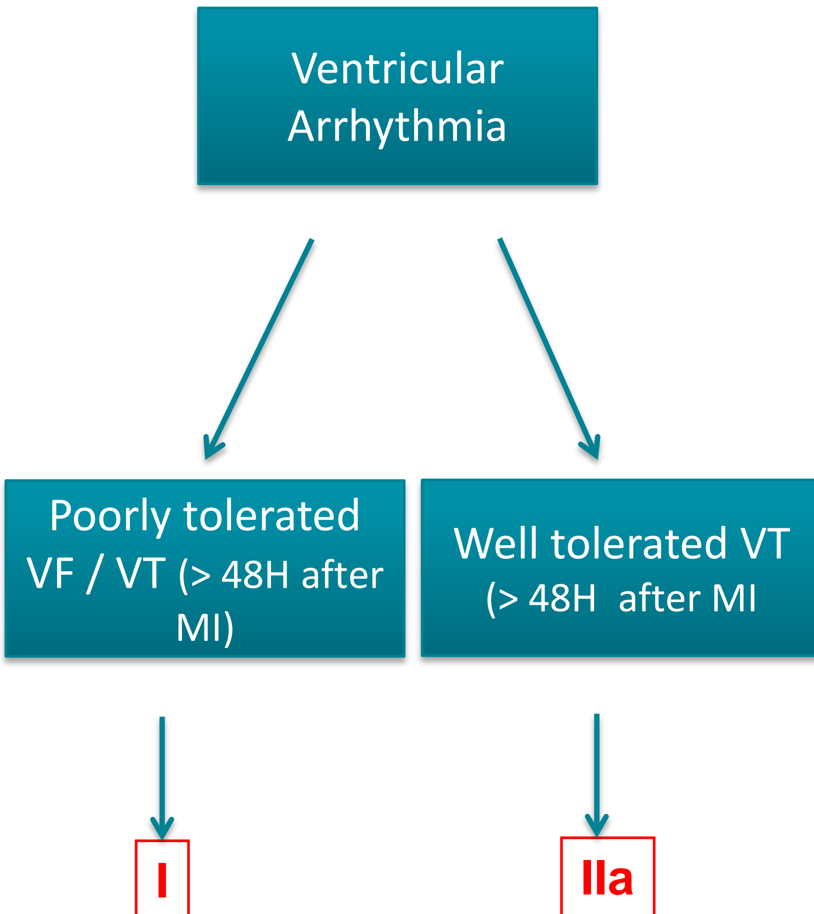
Wearable cardioverter defibrillator

Recommendation	Class[a]	Level[b]	Ref.[c]
The WCD may be considered for adult patients with poor LV systolic function who are at risk of sudden arrhythmic death for a limited period, but are not candidates for an implantable defibrillator (e.g. bridge to transplant, bridge to transvenous implant, peripartum cardiomyopathy, active myocarditis and arrhythmias in the early post-myocardial infarction phase).	IIb	C	167, 168

Secondary prevention by the ICD



ICD for the secondary prevention of sudden cardiac death and ventricular tachycardia

Recommendations	Class[a]	Level[b]	Ref.[c]
ICD implantation is recommended in patients with documented VF or haemodynamically not tolerated VT in the absence of reversible causes or within 48 h after myocardial infarction who are receiving chronic optimal medical therapy and have a reasonable expectation of survival with a good functional status >1 year.	I	A	151–154
ICD implantation should be considered in patients with recurrent sustained VT (not within 48 h after myocardial infarction) who are receiving chronic optimal medical therapy, have a normal LVEF and have a reasonable expectation of survival with good functional status for >1 year.	IIa	C	This panel of experts
In patients with VF/VT and an indication for ICD, amiodarone may be considered when an ICD is not available, contraindicated for concurrent medical reasons or refused by the patient.	IIb	C	155, 156

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Meta-analysis of the implantable cardioverter defibrillator secondary prevention trials

S. J. Connolly, A. P. Hallstrom, R. Cappato, E. B. Schron, K.-H. Kuck, D. P. Zipes, H. L. Greene, S. Boczor, M. Domanski, D. Follmann, M. Gent, R. S. Roberts, on behalf of the investigators of the AVID, CASH and CIDS studies

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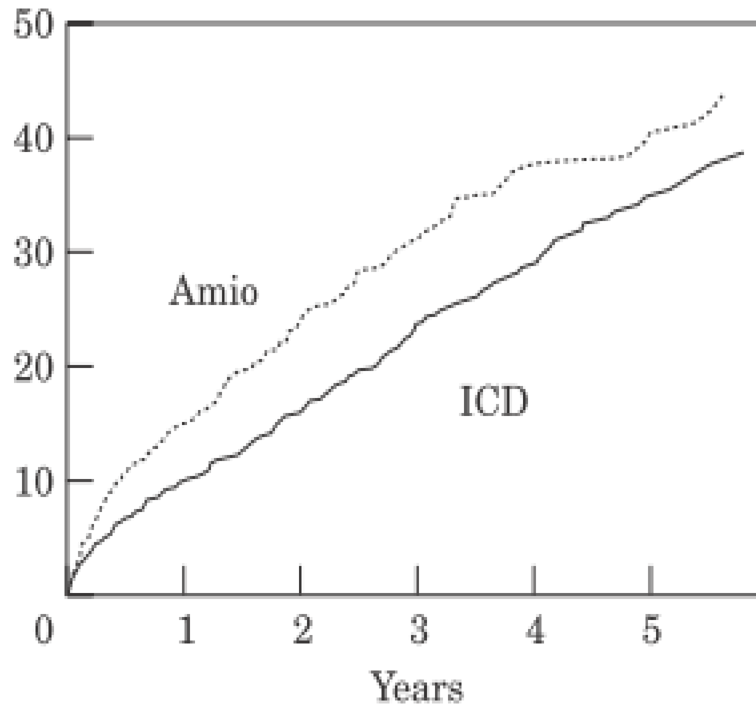
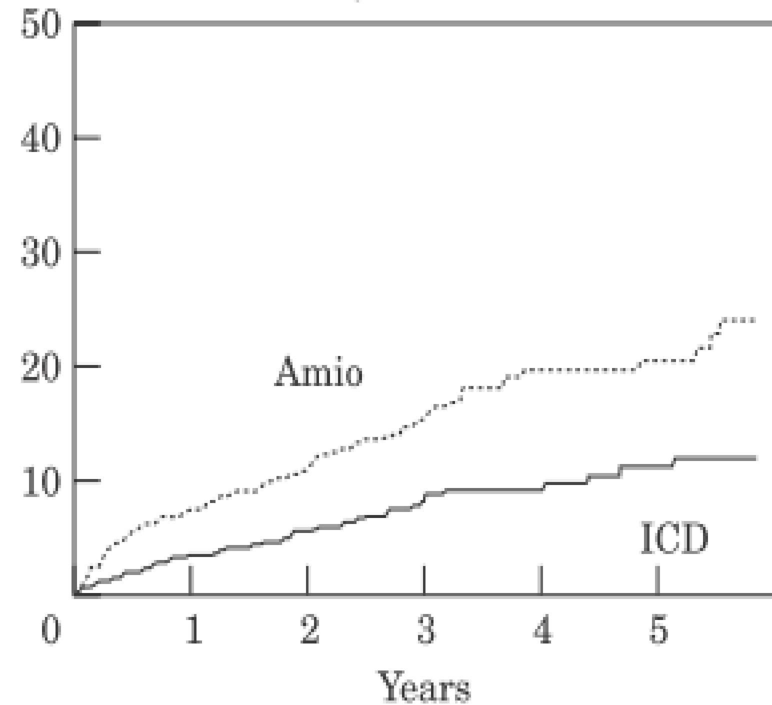
Fatal events





Number at risk

ICD:	934	715	467	273	159	104	934	715	467	273	159	104
Amio:	932	664	427	248	128	82	932	664	427	248	128	82