VÄSTRA GÖTALANDSREGIONEN

Strategy for Management of Heart Failure: Ischemic vs non-ischemic

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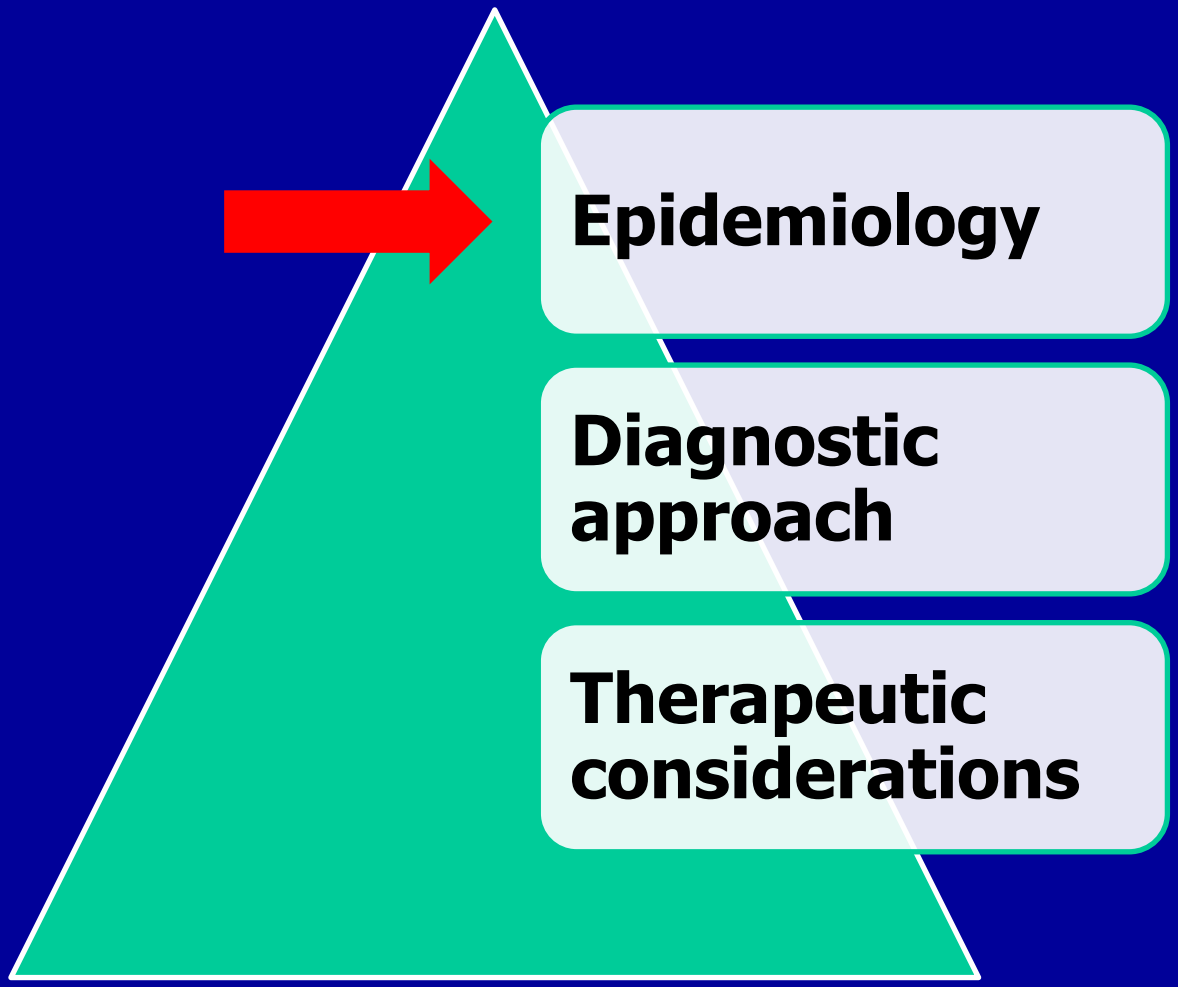

Epidemiology
Diagnostic approach
Therapeutic considerations

- Coronary heart disease – relative risk 8.1; overall PAR (population attributable risk) 62 percent,
  68 percent in men and
  56 percent in women.
- Hypertension – relative risk 1.4, PAR 10 percent.
- Obesity – relative risk 1.3, PAR 8 percent;
- Diabetes – relative risk 1.9, PAR 3 percent.
- Valvular heart disease – relative risk 1.5, PAR 2 percent

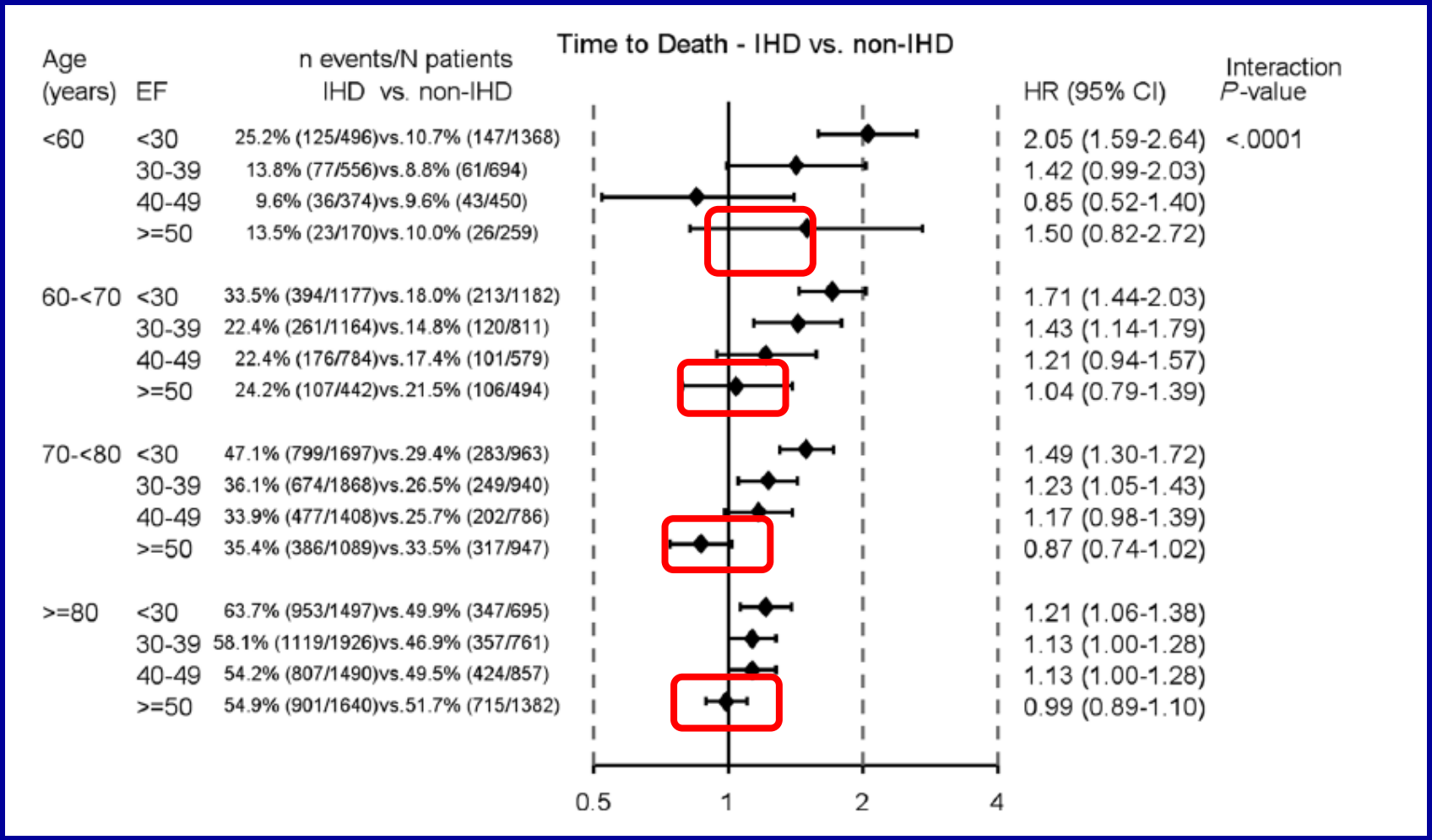
Arch Intern Med. 2001;161(7):996.

Table 2 Deaths, mortality event rate, and follow-up time for IHD vs. non-IHD

	Deaths (%)		Mortality event rate per 100 person-years		Median follow-up time, years (IQR)	
	IHD	Non-IHD	IHD	Non-IHD	IHD	Non-IHD
All individuals	41.1	28.2	14.8 (14.4–15.1)	9.7 (9.4–10.0)	2.4 (1.0–4.2)	2.6 (1.1–4.3)
Sex						
Male	40.3	26.8	14.3 (13.9–14.8)	9.0 (8.6–9.3)	2.4 (1.0–4.2)	2.7 (1.1–4.4)
Female	43.0	30.4	15.7 (15.1–16.3)	10.9 (10.3–11.4)	2.3 (0.9–4.1)	2.4 (1.0–4.2)
Age						
<60 years	16.4	10.0	4.5 (4.0–5.1)	2.8 (2.5–3.2)	3.4 (1.7–5.2)	3.3 (1.5–5.1)
60 to <70 years	26.3	17.6	8.2 (7.7–8.8)	5.5 (5.1–6.0)	2.9 (1.3–4.8)	2.9 (1.3–4.7)
70 to <80 years	38.5	28.9	13.0 (12.5–13.6)	9.9 (9.3–10.5)	2.7 (1.1–4.4)	2.6 (1.1–4.2)
≥80 years	57.7	49.9	26.3 (25.4–27.1)	22.4 (21.4–23.5)	1.7 (0.7–3.3)	1.7 (0.7–3.4)
EF						
<30%	46.7	23.5	17.9 (17.2–18.7)	7.7 (7.2–8.2)	2.1 (0.8–3.9)	2.7 (1.2–4.6)
30–39%	38.6	24.5	13.5 (12.9–14.0)	8.2 (7.6–8.8)	2.4 (1.0–4.3)	2.6 (1.1–4.4)
40–49%	36.9	28.8	12.4 (11.8–13.0)	10.2 (9.5–10.9)	2.7 (1.1–4.5)	2.5 (1.1–4.1)
≥50%	42.4	37.8	15.9 (15.1–16.7)	14.0 (13.2–14.8)	2.2 (0.9–4.0)	2.3 (0.9–4.0)
HF duration						
<6 months	31.9	22.7	11.2 (10.7–11.6)	7.8 (7.5–8.2)	2.5 (1.1–4.3)	2.6 (1.1–4.3)
≥6 months	49.3	37.6	18.0 (17.5–18.5)	12.7 (12.1–13.2)	2.3 (0.9–4.2)	2.6 (1.1–4.5)

EF, ejection fraction; HF, heart failure; IHD, ischaemic heart disease; IQR, inter-quartile range; non-IHD, non-ischaemic heart disease.

Jonas Silverdal, Helen Sjöland, Entela Bollano, Aldina Pivodic, Ulf Dahlström, Michael Fu ESC Heart Fail, 2020, 7(1):264-273.



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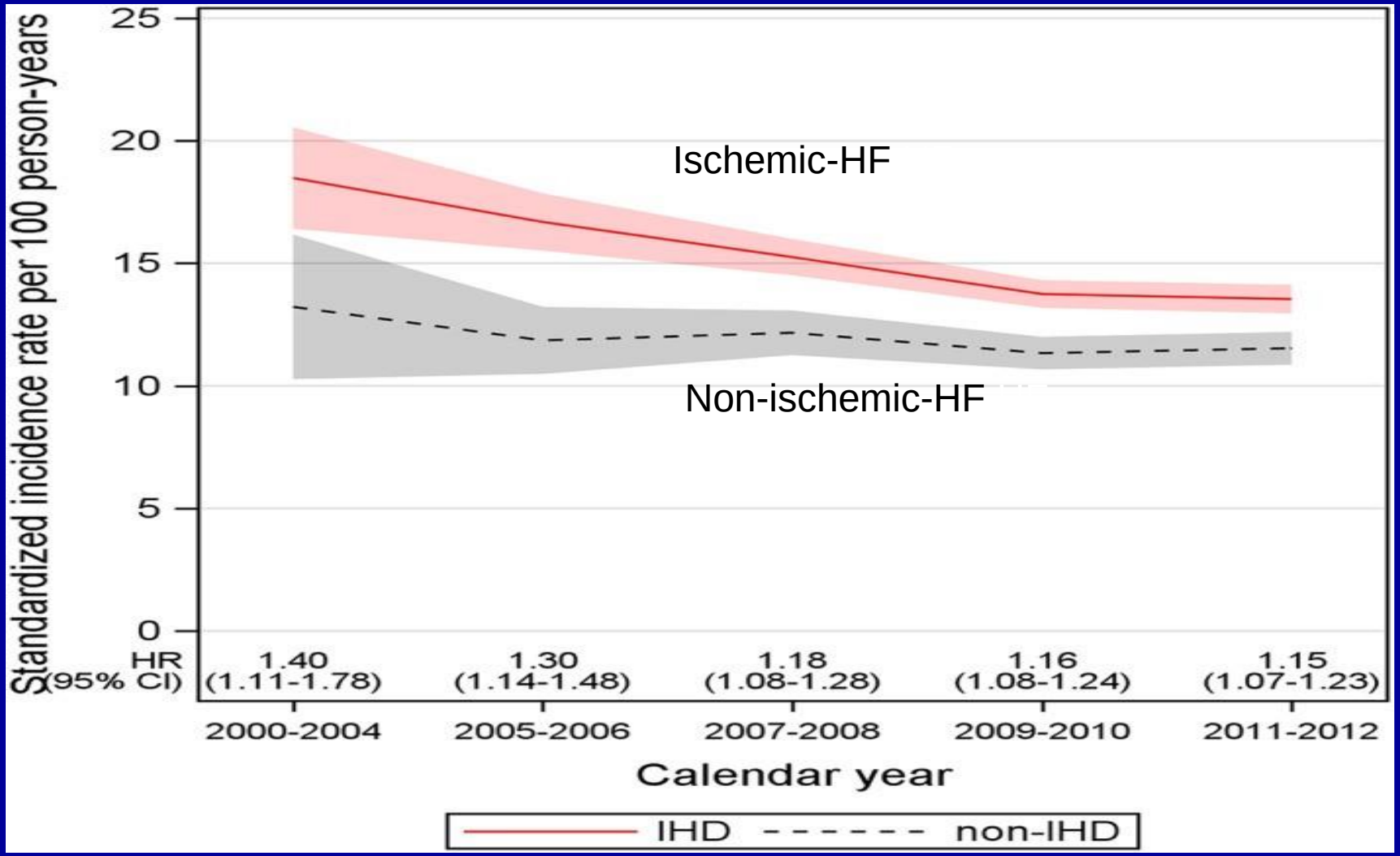

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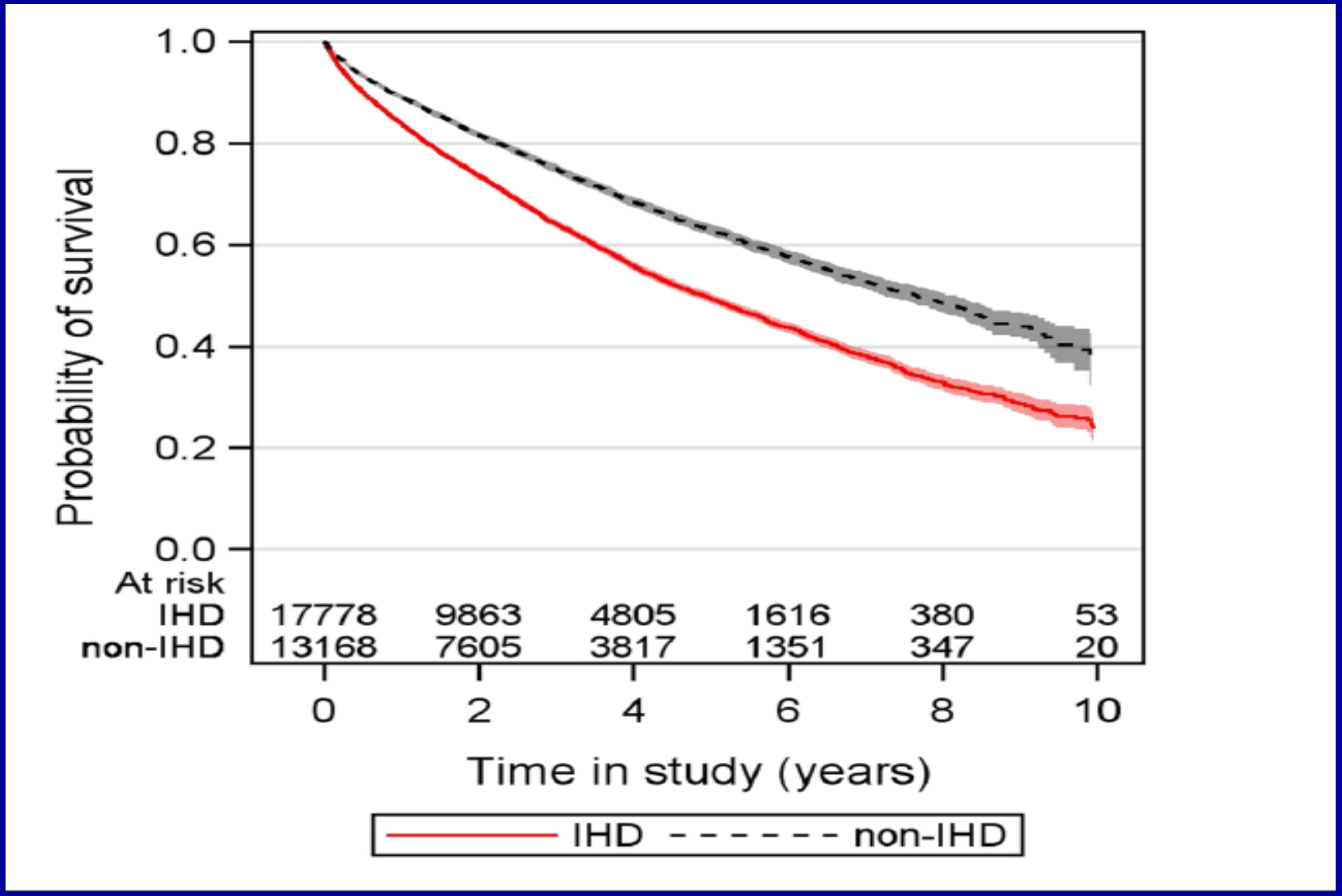

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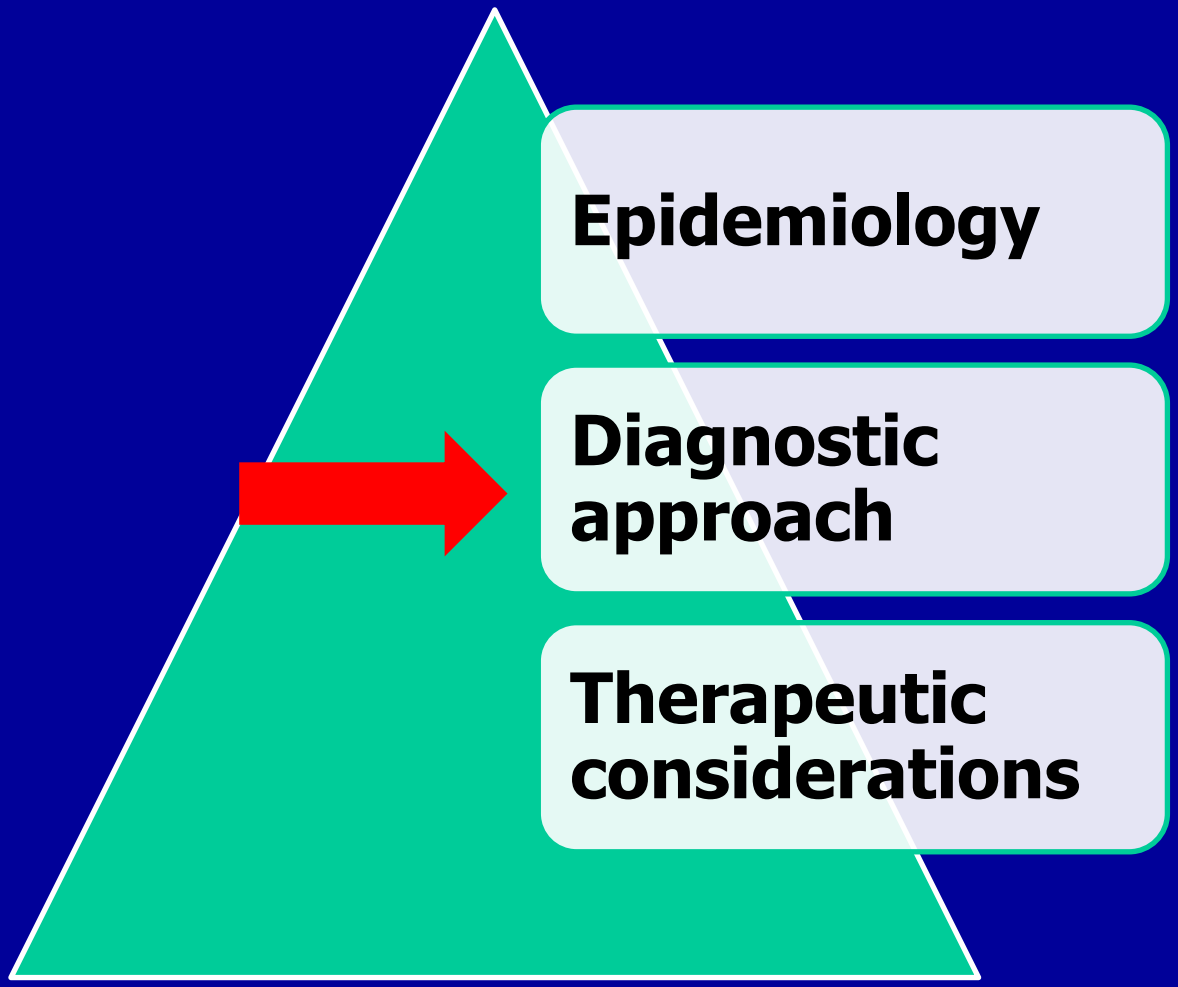
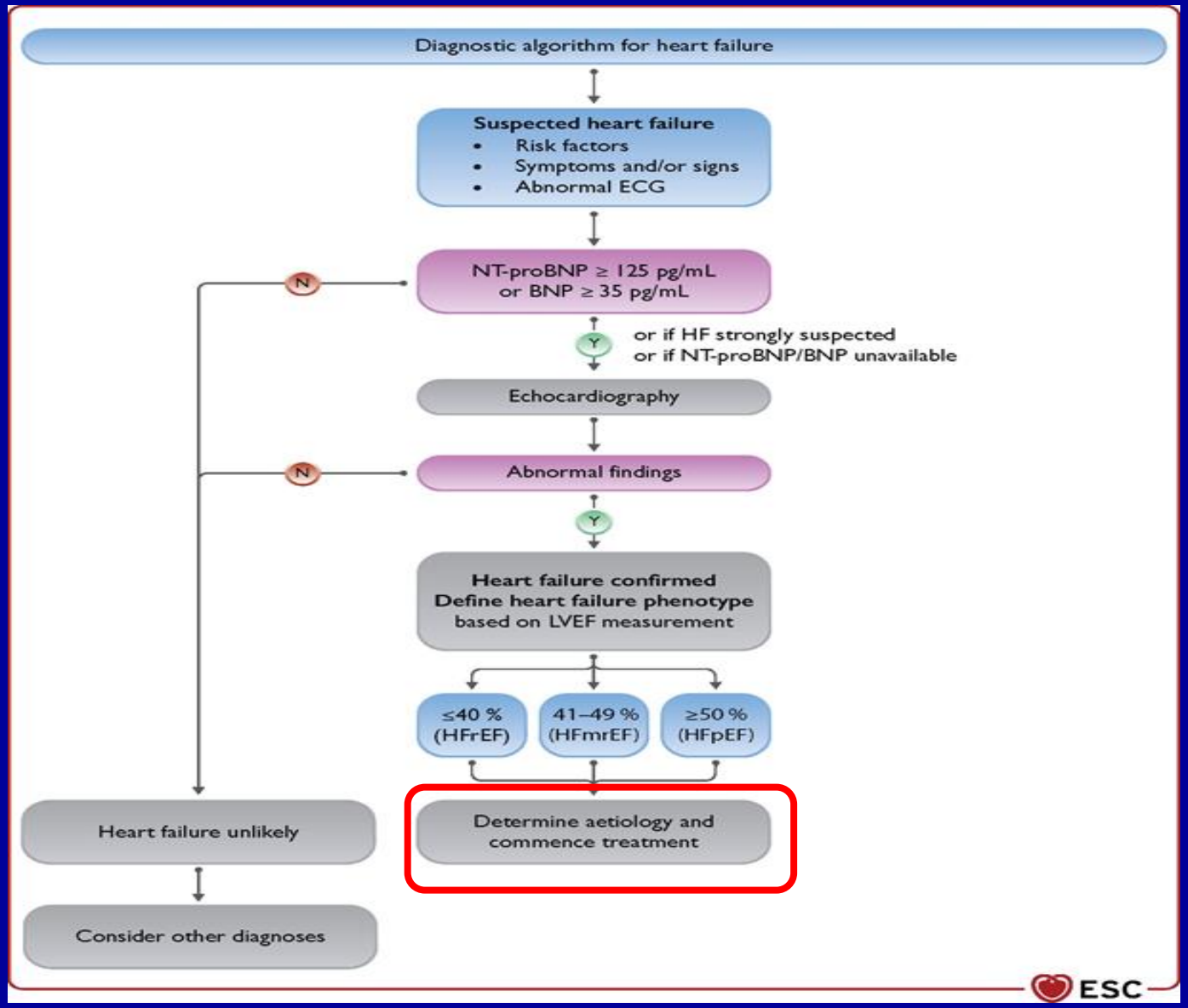
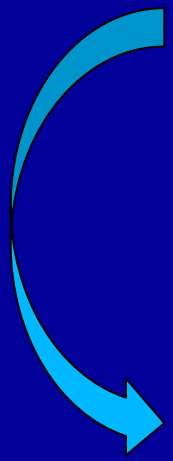
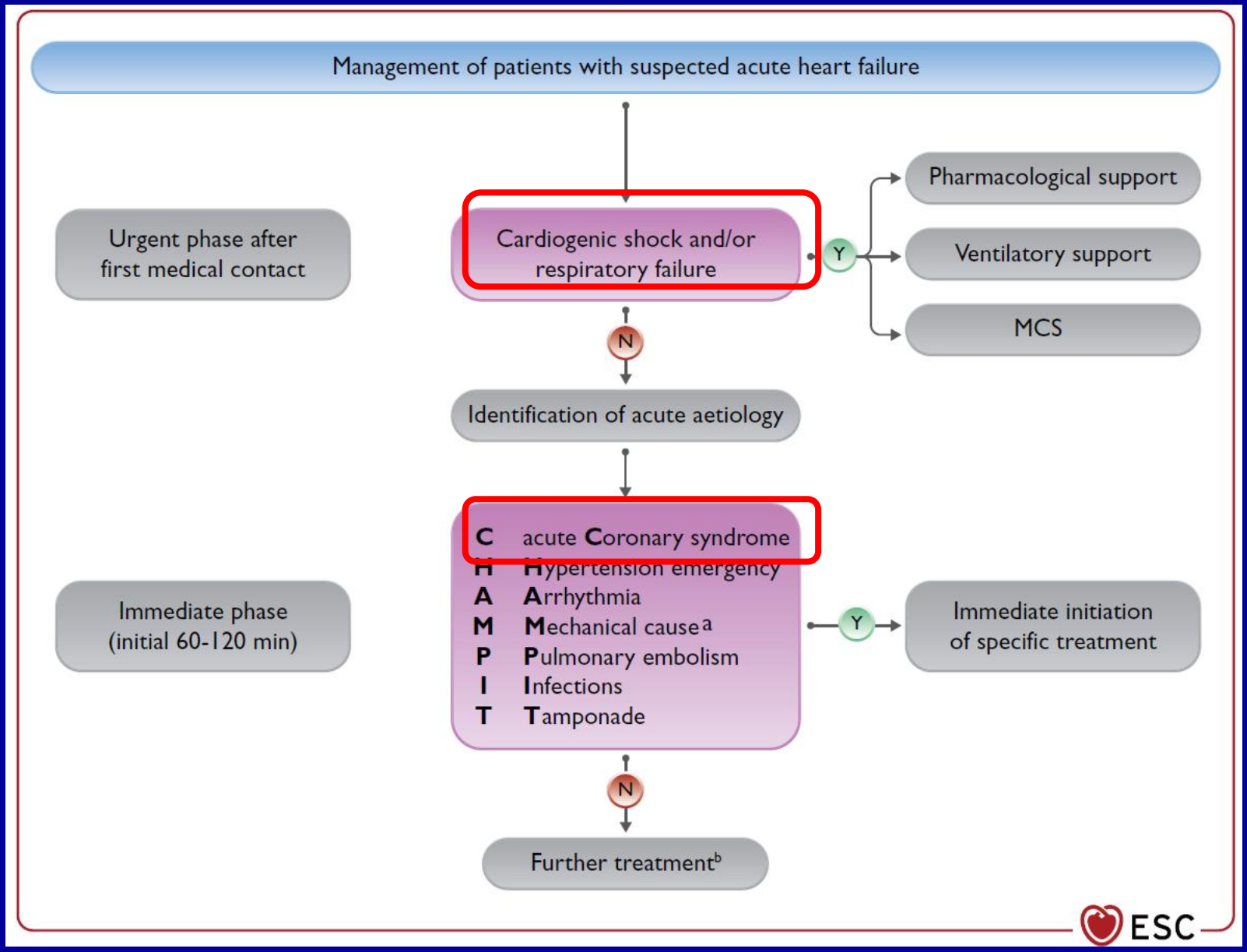

Epidemiology
Diagnostic approach
Therapeutic considerations


Diagnostic algorithm for heart failure
Suspected heart failure
Risk factors
Symptoms and/or signs
Abnormal ECG
NT-proBNP ≥ 125 pg/mL
or BNP ≥ 35 pg/mL
N
Y
or if HF strongly suspected
or if NT-proBNP/BNP unavailable
Echocardiography
N
Abnormal findings
Y
Heart failure confirmed
Define heart failure phenotype
based on LVEF measurement
≤40 %
(HFrEF)
41–49 %
(HFmrEF)
≥50 %
(HFpEF)
Heart failure unlikely
Determine aetiology and
commence treatment
Consider other diagnoses
ESC

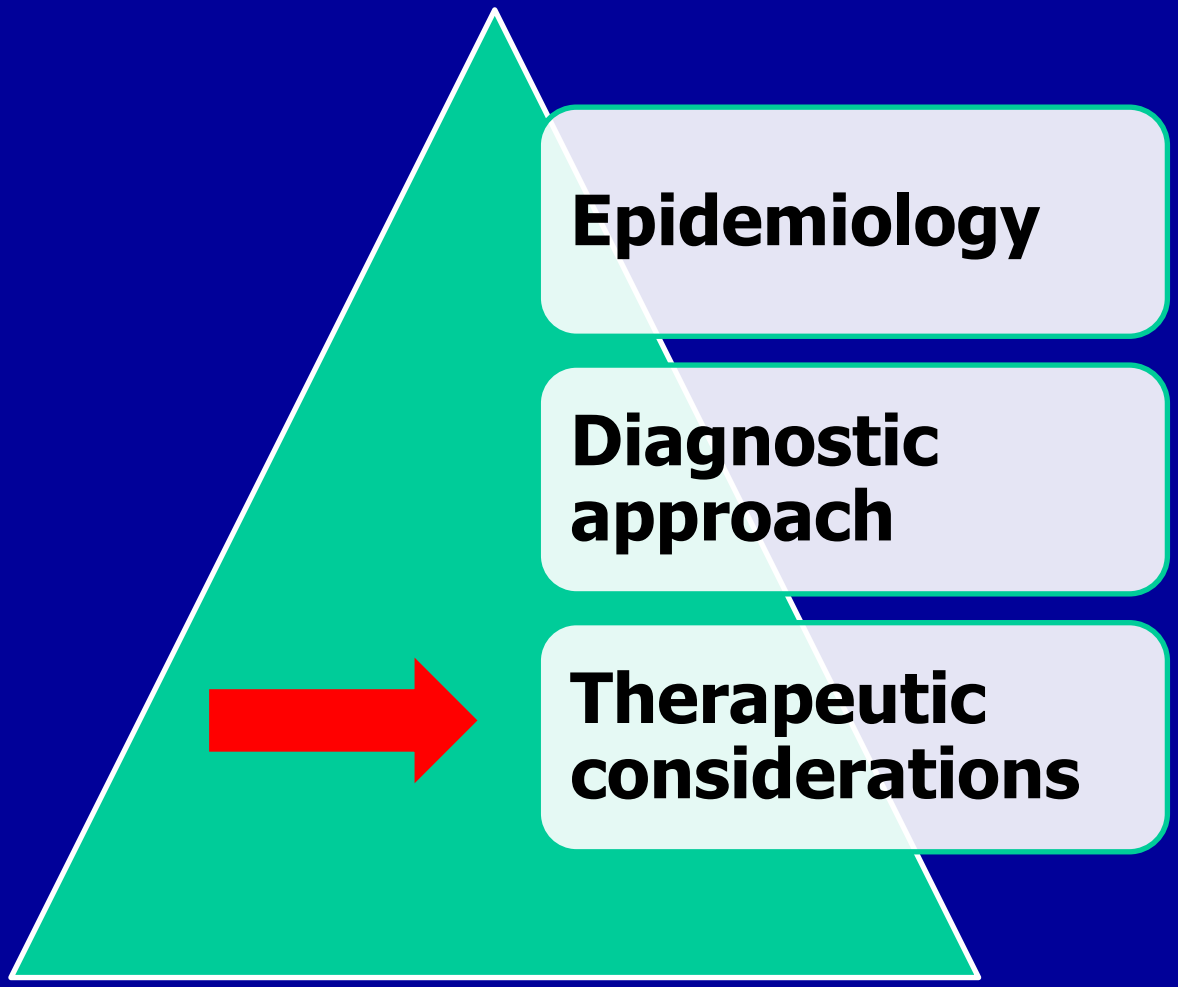
CAD - the most common cause of HF



- CAD - should be evaluated virtually in all patients with unexplained HF
- CAD - should be considered as possible cause of HF in all patients presenting with new onset HF


Management of patients with suspected acute heart failure
Urgent phase after first medical contact
Cardiogenic shock and/or respiratory failure
Y
Pharmacological support
Ventilatory support
MCS
N
Identification of acute aetiology
Immediate phase (initial 60-120 min)
C acute Coronary syndrome
H Hypertension emergency
A Arrhythmia
M Mechanical cause[a]
P Pulmonary embolism
I Infections
T Tamponade
Y
Immediate initiation of specific treatment
N
Further treatment[b]
ESC

- Invasive coronary angiography
- CT coronary angiography
- Imaging stress tests (echo, nuclear, CMR)


Epidemiology
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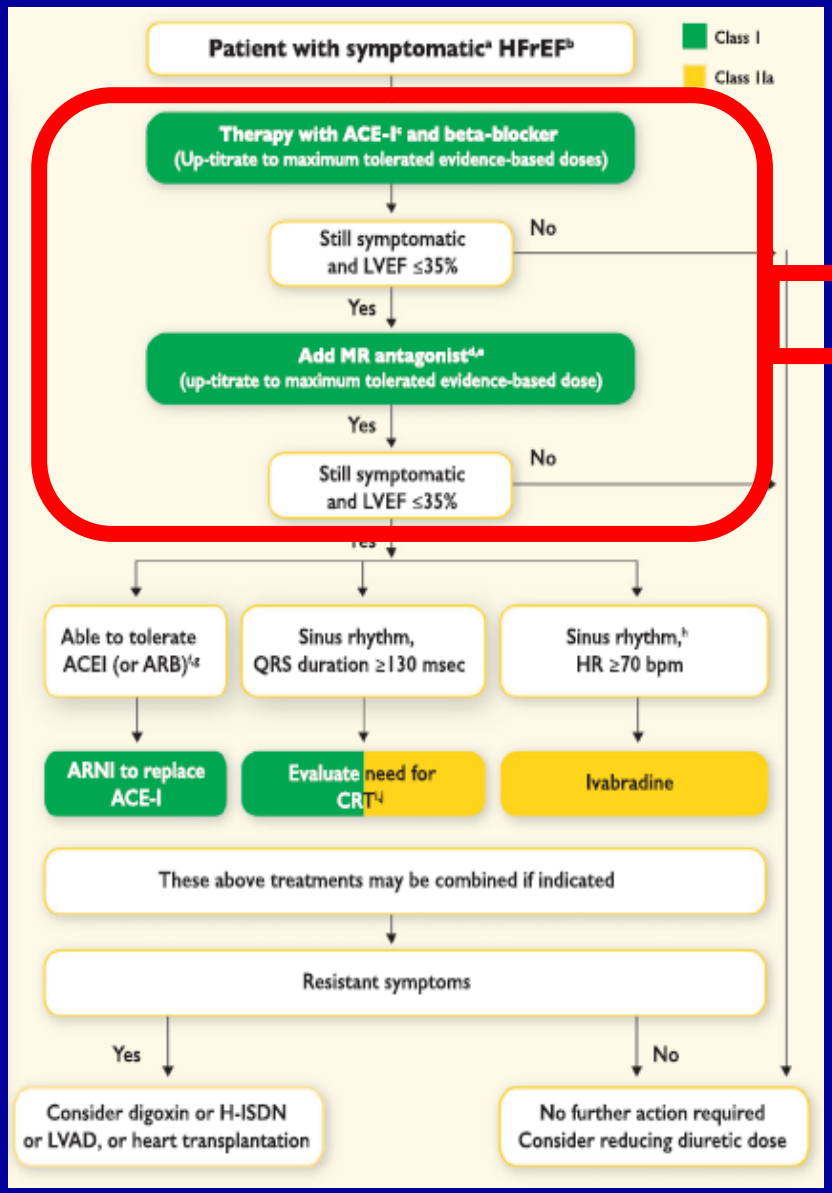
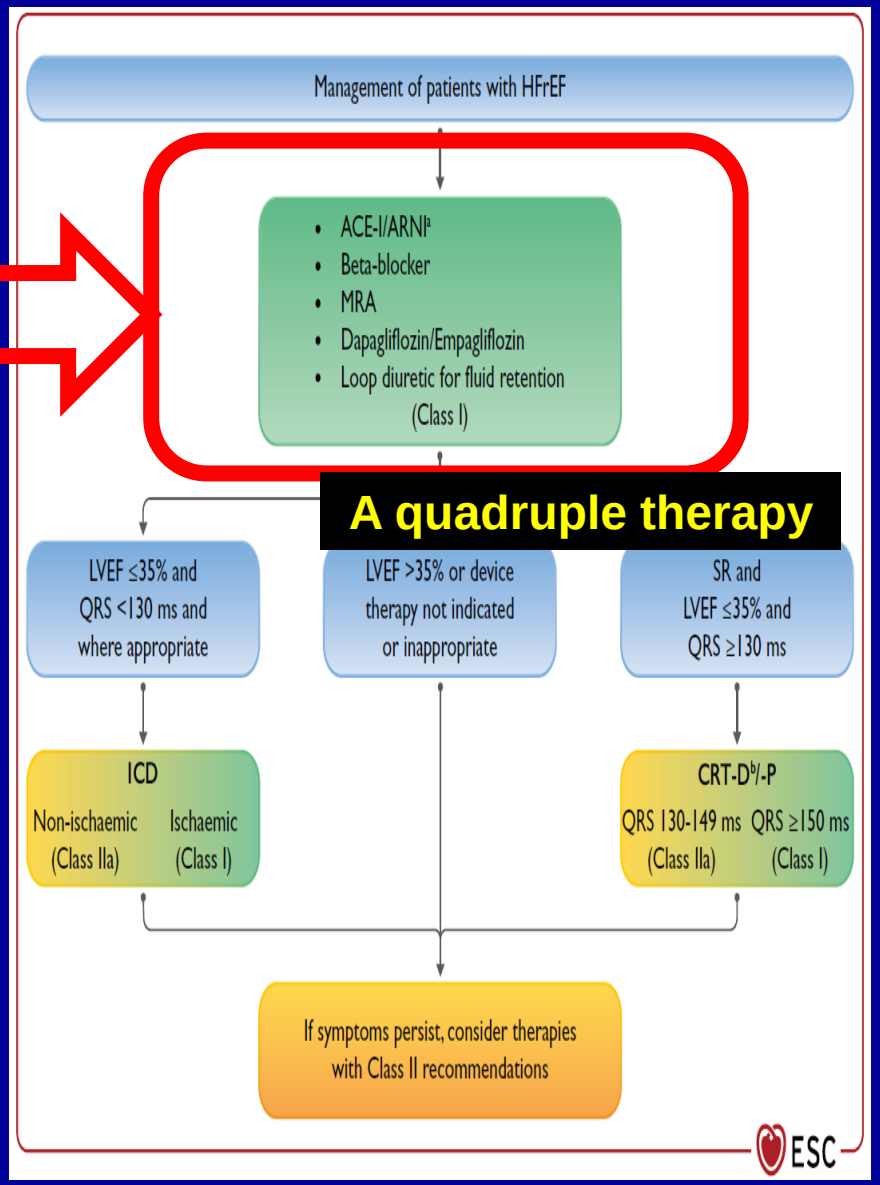
2016


Patient with symptomatic[a] HFrEF[b]
Class I
Class IIa
Therapy with ACE-I[c] and beta-blocker
(Up-titrate to maximum tolerated evidence-based doses)
Still symptomatic and LVEF ≤35%
No
Yes
Add MR antagonist[d,e]
(up-titrate to maximum tolerated evidence-based dose)
Yes
Still symptomatic and LVEF ≤35%
No
Able to tolerate ACEI (or ARB)[f,g]
Sinus rhythm, QRS duration ≥130 msec
Sinus rhythm,[h] HR ≥70 bpm
ARNI to replace ACE-I
Evaluate need for CRT[i]
Ivabradine
These above treatments may be combined if indicated
Resistant symptoms
Yes
No
Consider digoxin or H-ISDN or LVAD, or heart transplantation
No further action required
Consider reducing diuretic dose

2021

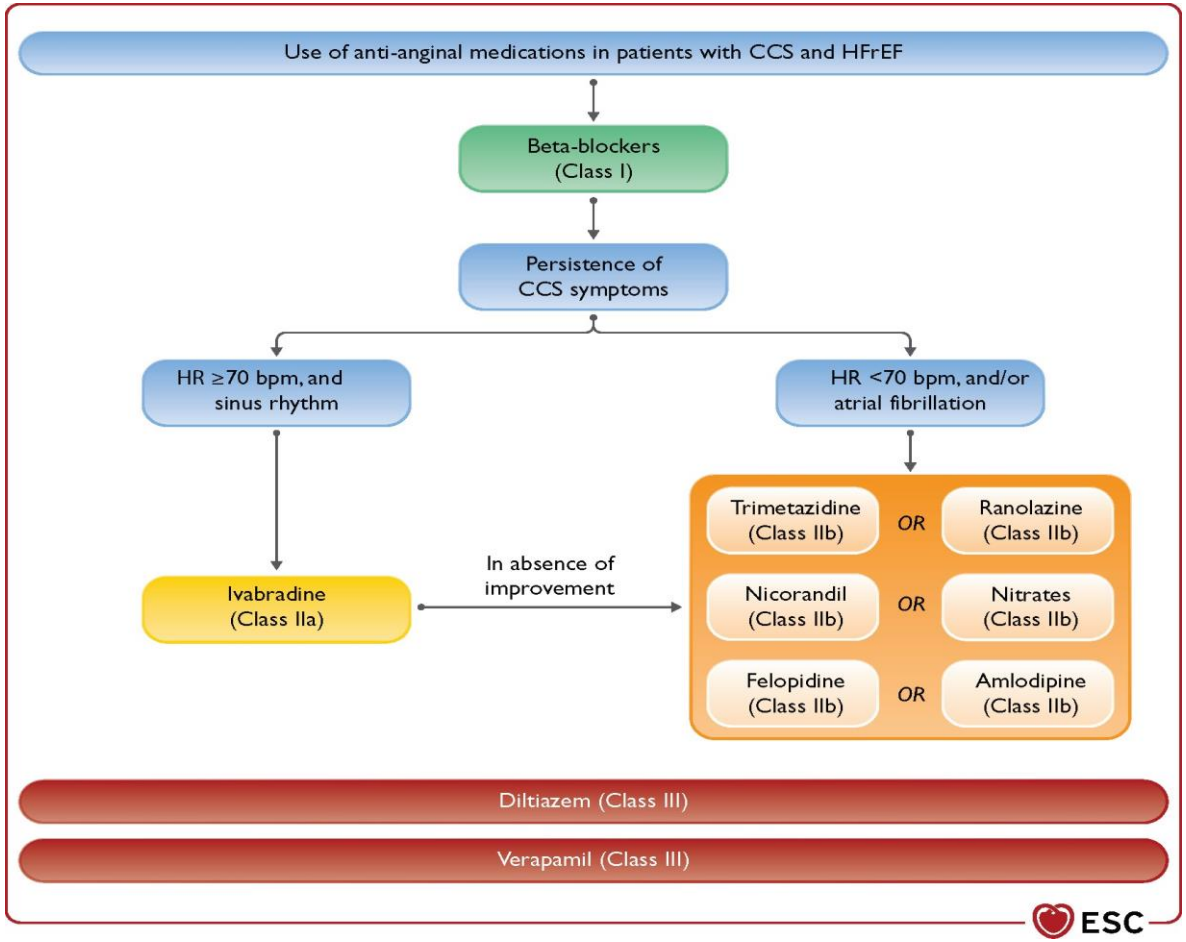

Management of patients with HFrEF
ACE-I/ARNI[a]
Beta-blocker
MRA
Dapagliflozin/Empagliflozin
Loop diuretic for fluid retention
(Class I)
A quadruple therapy
LVEF ≤35% and QRS <130 ms and where appropriate
LVEF >35% or device therapy not indicated or inappropriate
SR and LVEF ≤35% and QRS ≥130 ms
ICD
Non-ischaemic (Class IIa)
Ischaemic (Class I)
CRT-D[b]/-P
QRS 130-149 ms (Class IIa)
QRS ≥150 ms (Class I)
If symptoms persist, consider therapies with Class II recommendations
ESC

2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

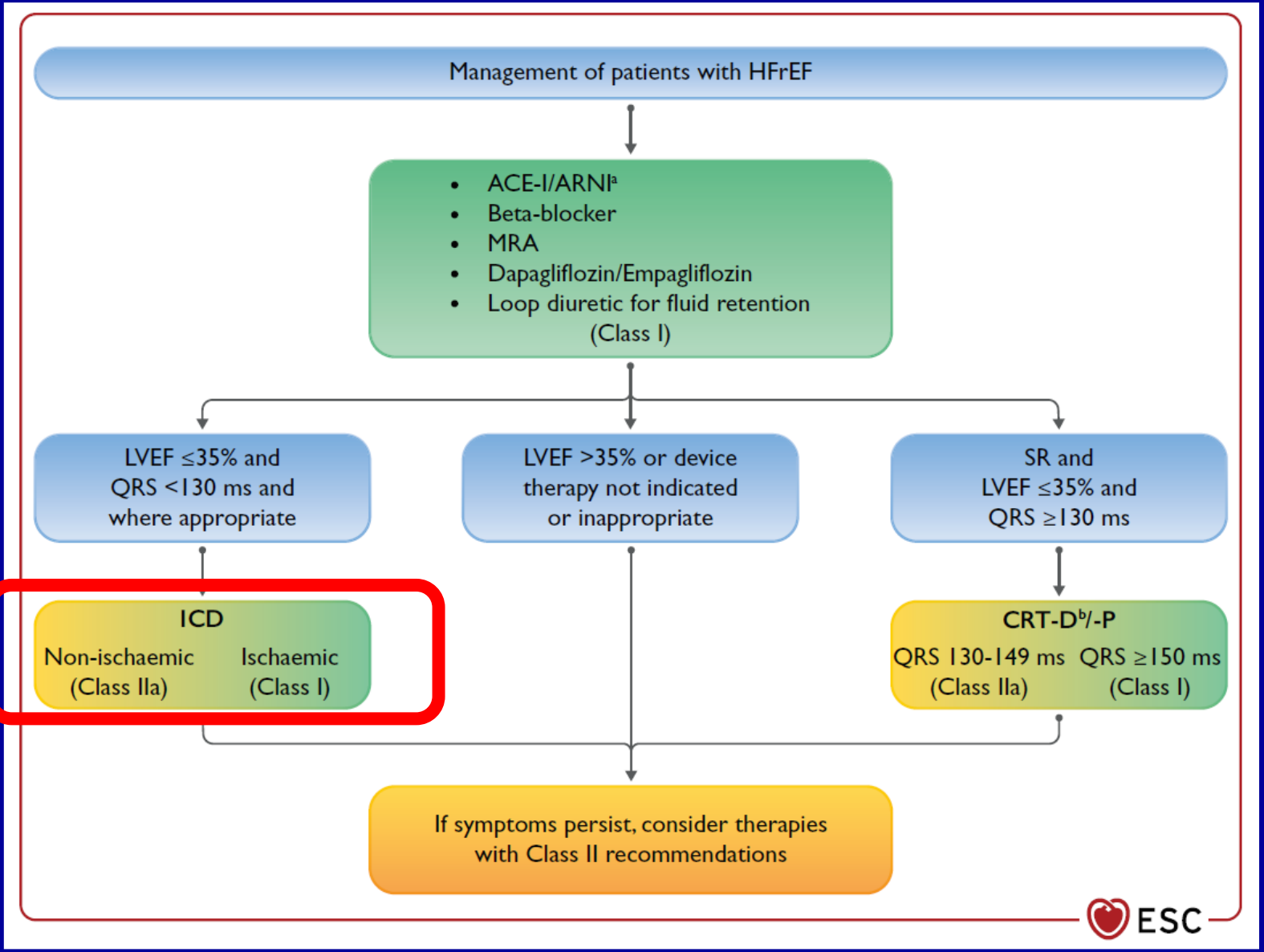
Pharmacological treatments indicated in patients with (NYHA class II–IV) heart failure with reduced ejection fraction (LVEF ≤40%)

Recommendations	Class[a]	Level[b]
An ACE-I is recommended for patients with HFrEF to reduce the risk of HF hospitalization and death.[110–113]	I	A
A beta-blocker is recommended for patients with stable HFrEF to reduce the risk of HF hospitalization and death.[114–120]	I	A
An MRA is recommended for patients with HFrEF to reduce the risk of HF hospitalization and death.[121,122]	I	A
Dapagliflozin or empagliflozin are recommended for patients with HFrEF to reduce the risk of HF hospitalization and death.[108,109]	I	A
Sacubitril/valsartan is recommended as a replacement for an ACE-I in patients with HFrEF to reduce the risk of HF hospitalization and death.[105]	I	B

Figure 15 Algorithm for the medical treatment of chronic coronary syndrome in patients with heart failure with reduced ...



Eur Heart J, Volume 42, Issue 36, 21 September 2021, Pages 3599–3726, https://doi.org/10.1093/eurheartj/ehab368


Management of patients with HFrEF
ACE-I/ARNI[a]
Beta-blocker
MRA
Dapagliflozin/Empagliflozin
Loop diuretic for fluid retention
(Class I)
LVEF ≤35% and QRS <130 ms and where appropriate
LVEF >35% or device therapy not indicated or inappropriate
SR and LVEF ≤35% and QRS ≥130 ms
ICD
Non-ischaemic (Class IIa)
Ischaemic (Class I)
CRT-D[b]/-P
QRS 130-149 ms (Class IIa)
QRS ≥150 ms (Class I)
If symptoms persist, consider therapies with Class II recommendations
ESC

An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients with symptomatic HF (NYHA class II–III) of an ischaemic aetiology (unless they have had a MI in the prior 40 days—see below), and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than 1 year with good functional status.[161,165]	I	A
An ICD should be considered to reduce the risk of sudden death and all-cause mortality in patients with symptomatic HF (NYHA class II–III) of a non-ischaemic aetiology, and an LVEF ≤35% despite ≥3 months of OMT, provided they are expected to survive substantially longer than 1 year with good functional status.[161,166,167]	IIa	A

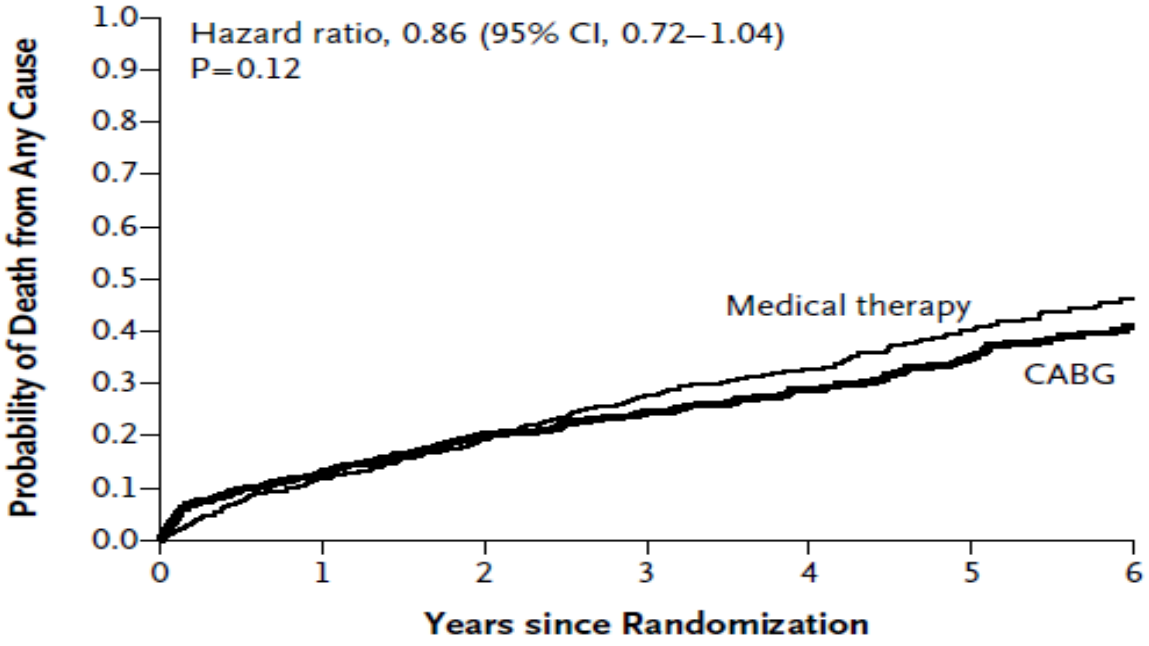
STICH
5-year-follow-up

Table 1. Baseline Characteristics of the Patients.*

Variable	Medical Therapy (N = 602)	CABG (N = 610)
Age — yr		
Median	59	60
Interquartile range	53–67	54–68
Female sex — no. (%)	75 (12)	73 (12)
Race or ethnic group — no. (%)†		
White	402 (67)	389 (64)
Hispanic, Latino, or nonwhite	200 (33)	221 (36)
Body-mass index‡		
Median	27	27
Interquartile range	24–30	24–30
Medical history — no. (%)		
Previous myocardial infarction	472 (78)	462 (76)
Hyperlipidemia	370 (61)	360 (59)
Hypertension	370 (61)	358 (59)
Diabetes	238 (40)	240 (39)
Previous percutaneous coronary intervention	74 (12)	82 (13)
Chronic renal insufficiency	45 (7)	49 (8)
Previous stroke	41 (7)	51 (8)
Previous CABG	14 (2)	22 (4)
Current smoker	122 (20)	130 (21)
Current CCS angina class§		
0	225 (37)	217 (36)
I	91 (15)	96 (16)
II	260 (43)	265 (43)
III	23 (4)	25 (4)
IV	3 (<1)	7 (1)
Current NYHA class		
I	74 (12)	65 (11)
II	307 (51)	319 (52)
III	205 (34)	207 (34)
IV	16 (3)	19 (3)
Systolic blood pressure — mm Hg		
Median	120	120
Interquartile range	110–130	110–130
Pulse — beats/min		
Median	72	74
Interquartile range	65–80	66–82
6-Minute walk distance — ft¶		
Median	1115	1145
Interquartile range	840–1345	863–1320

N Engl J Med 2011;364:1607-16.

STICH
5-year-follow-up

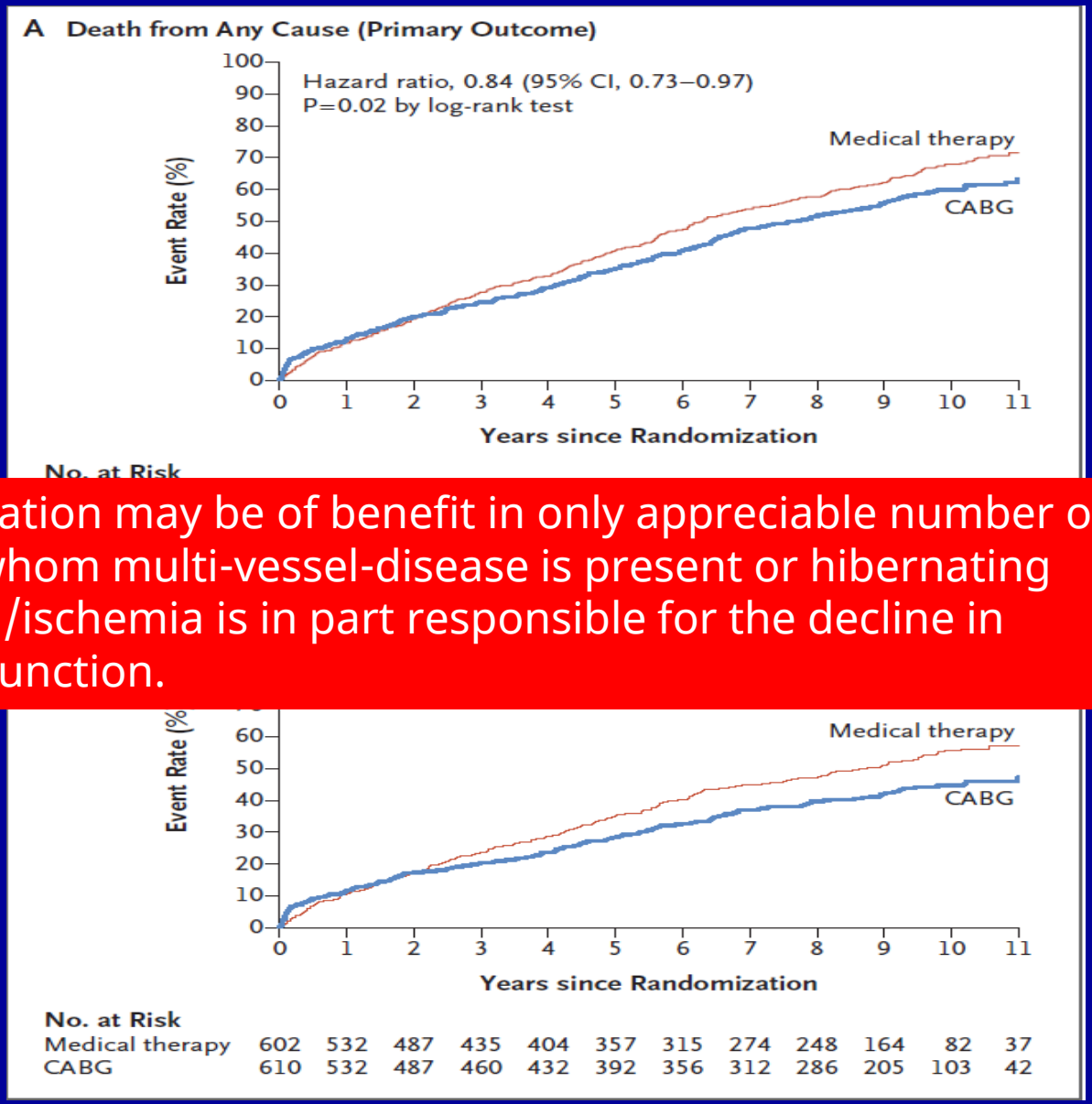


No. at Risk							
Medical therapy	602	532	487	435	312	154	80
CABG	610	532	486	459	340	174	91

Figure 1. Kaplan–Meier Curves for the Probability of Death from Any Cause.
CABG denotes coronary-artery bypass grafting.

N Engl J Med 2011;364:1607-16.

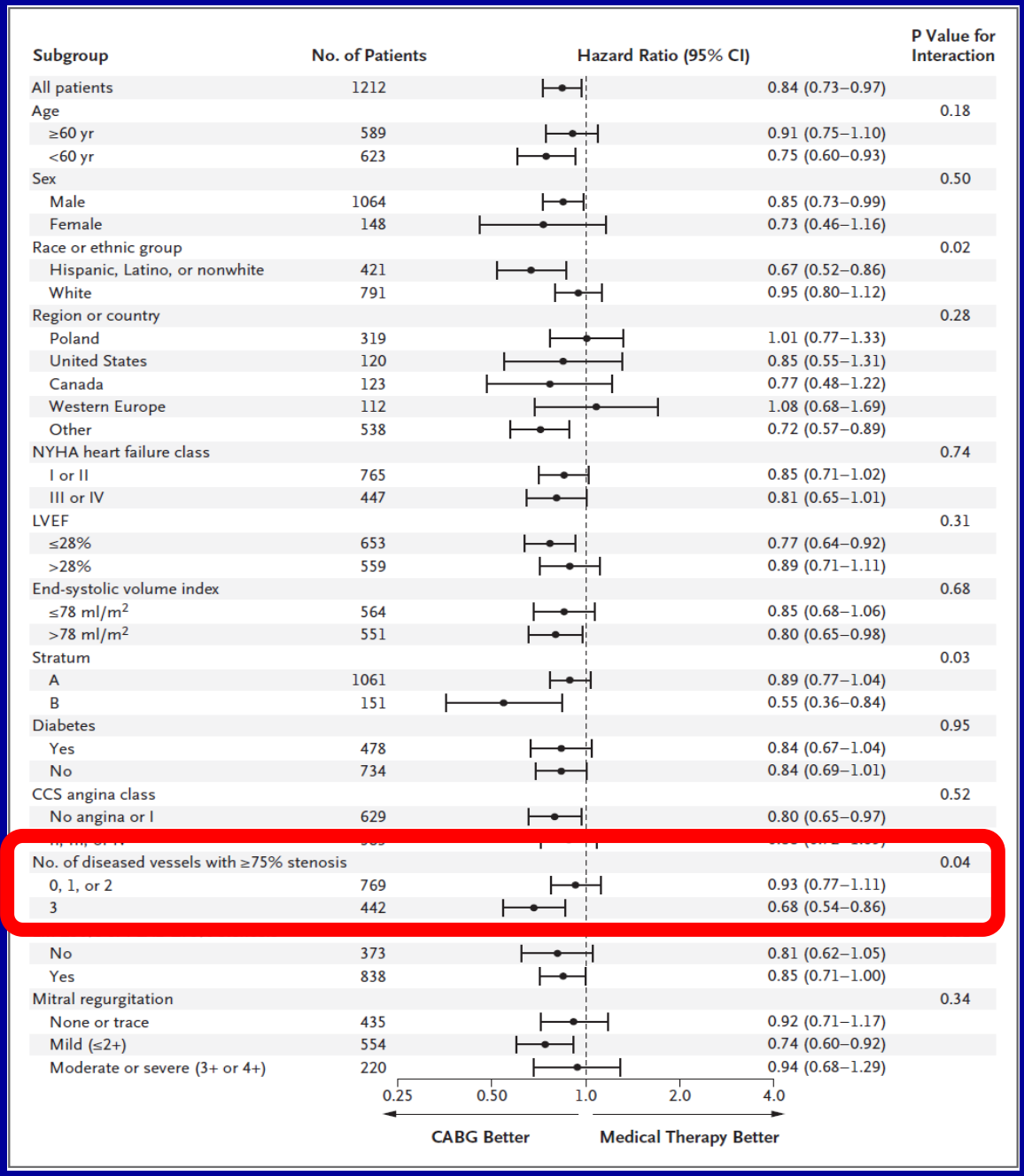
STICH
10-year-follow-up



Revascularization may be of benefit in only appreciable number of patients in whom multi-vessel-disease is present or hibernating myocardium/ischemia is in part responsible for the decline in myocardial function.

N Engl J Med 2016;374:1511-20.

STICH
10-year-follow-up



Subgroup	No. of Patients	Hazard Ratio (95% CI)	P Value for Interaction
All patients	1212	0.84 (0.73–0.97)	
Age			0.18
≥60 yr	589	0.91 (0.75–1.10)	
<60 yr	623	0.75 (0.60–0.93)	
Sex			0.50
Male	1064	0.85 (0.73–0.99)	
Female	148	0.73 (0.46–1.16)	
Race or ethnic group			0.02
Hispanic, Latino, or nonwhite	421	0.67 (0.52–0.86)	
White	791	0.95 (0.80–1.12)	
Region or country			0.28
Poland	319	1.01 (0.77–1.33)	
United States	120	0.85 (0.55–1.31)	
Canada	123	0.77 (0.48–1.22)	
Western Europe	112	1.08 (0.68–1.69)	
Other	538	0.72 (0.57–0.89)	
NYHA heart failure class			0.74
I or II	765	0.85 (0.71–1.02)	
III or IV	447	0.81 (0.65–1.01)	
LVEF			0.31
≤28%	653	0.77 (0.64–0.92)	
>28%	559	0.89 (0.71–1.11)	
End-systolic volume index			0.68
≤78 ml/m^2	564	0.85 (0.68–1.06)	
>78 ml/m^2	551	0.80 (0.65–0.98)	
Stratum			0.03
A	1061	0.89 (0.77–1.04)	
B	151	0.55 (0.36–0.84)	
Diabetes			0.95
Yes	478	0.84 (0.67–1.04)	
No	734	0.84 (0.69–1.01)	
CCS angina class			0.52
No angina or I	629	0.80 (0.65–0.97)	
No. of diseased vessels with ≥75% stenosis			0.04
0, 1, or 2	769	0.93 (0.77–1.11)	
3	442	0.68 (0.54–0.86)	
No	373	0.81 (0.62–1.05)	
Yes	838	0.85 (0.71–1.00)	
Mitral regurgitation			0.34
None or trace	435	0.92 (0.71–1.17)	
Mild (≤2+)	554	0.74 (0.60–0.92)	
Moderate or severe (3+ or 4+)	220	0.94 (0.68–1.29)	

0.25 0.50 1.0 2.0 4.0

CABG Better | Medical Therapy Better

N Engl J Med 2016;374:1511-20.

Summary

Ischemic HF differ has worse prognosis than non-ischemic HF. Larger difference in lower EF and younger age. Above differencde appear when EF >50%

Ischemic cause should be actively considered and proper investigations should be conducted based on guideline (all new onset HF with ACS, some CCS when angina is presistent or arrthythima with suspect underlying ischemia)

Therapy for ischemic HF include both GDMT for HF and anti-ischemic treatment as well as revascularization

Revascularization may be of benefit in the appreciable number of patients in whom hibernating myocardium or ischemia is in part responsible for the decline in myocardial function.