

A szívelégtelenség korszerű szemlélete és kezelése



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Szívelégtelenség direkt következményei

Remodelling

- Dilatáció
- Fibrózis

Vazokonstriktció

Volumenterhelés

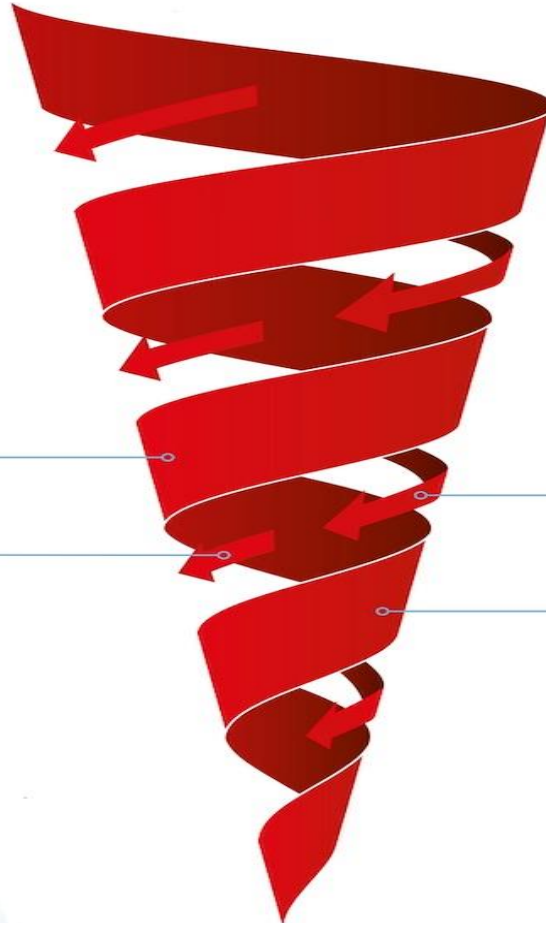
Miokardiális energetika változása

Tachikardia

Pulmonális hipertónia

Jobbszívfél elégtelenség

Szívelégtelenség



Neurohormonális aktiváció

Renin-angiotenzin-aldoszteron

Szimpatikus idegrendszer

Nátriuretikus peptidek

Vazopresszin

Endotelin

Gyulladás

Citokinek

Célszerv károsodás

Vázizom abnormalitás

Vashiány

Veseelégtelenség

Légzésszabályozás zavarai

Szorongás

Depresszió

Zavartság

Compliance zavar

Cahexia

Kardiális társbetegségek

Pitvarfibrilláció

Miokardiális iszkémia

Mitrális regurgitáció

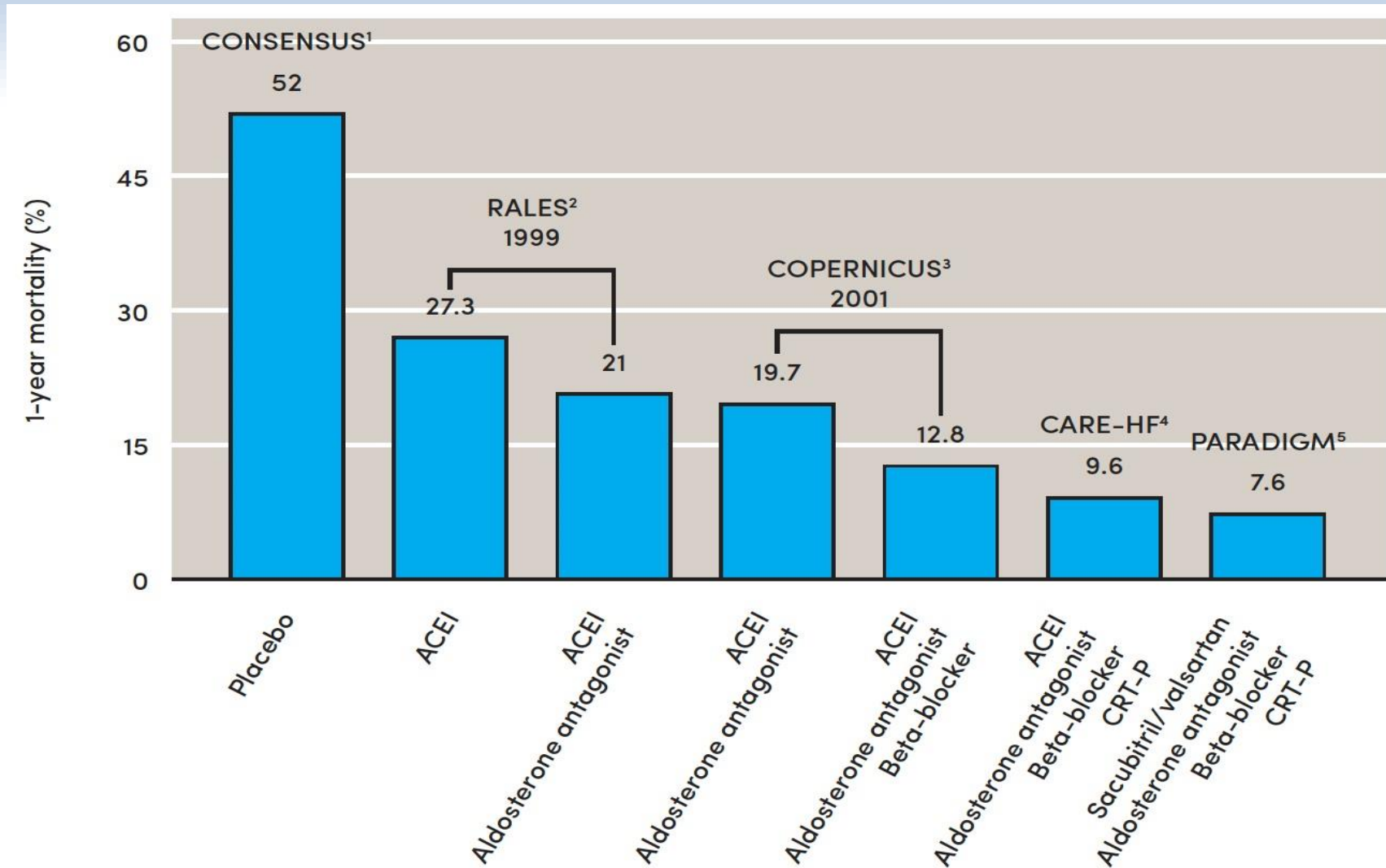
BTSZB

Kamrai rituszavarok

Halál

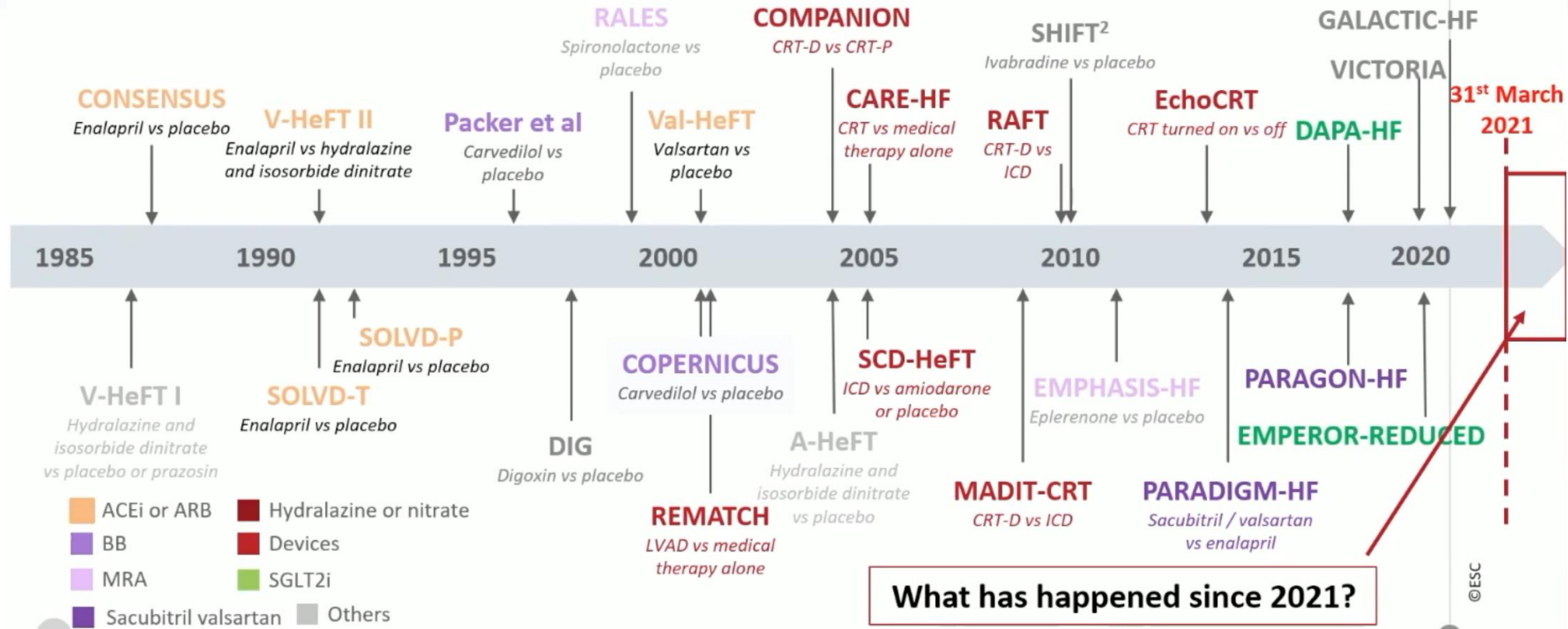
<https://www.heartfoundation.org.au>

A mortalitás csökkenése szívelégtelenségben az 1980-as évektől



1. CONSENSUS Trial Study Group. N Engl J Med. 1987;316:1429–1435; 2. Pitt et al. N Engl J Med. 1999;341:709–717; 3. Packer et al. N Engl J Med. 2001;344:1651–1658; 4. Cleland et al. N Engl J Med. 2005;352:1539–1549; 5. McMurray et al. N Engl J Med. 2014;371:993–1004.

In 2021, we had 34 years of heart failure therapy to consider

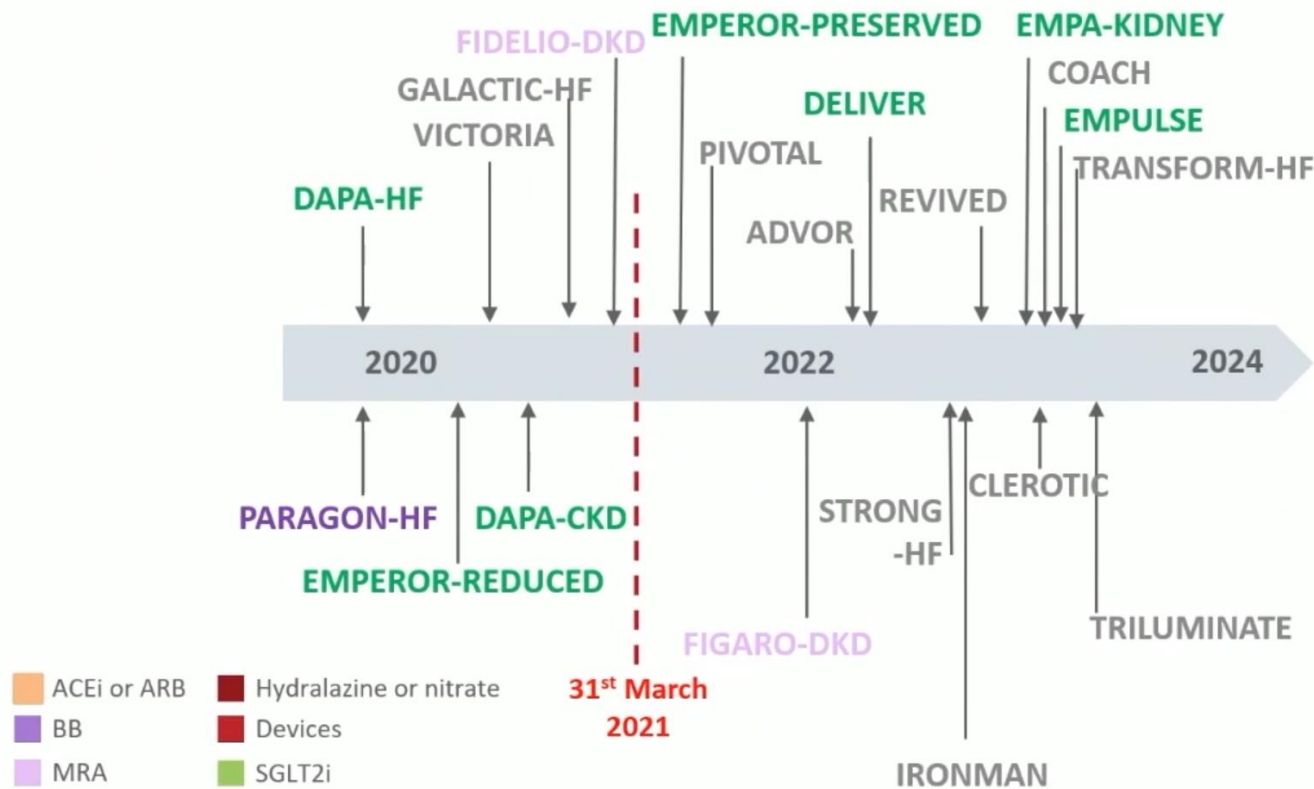


What has happened since 2021?

www.escardio.org/guidelines

2023 Focused update of the 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure (European Heart Journal; 2023 – doi:10.1093/eurheartj/ehad195)

Amazing progress in heart failure



www.escardio.org/guidelines

2023 Focused update of the 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure (European Heart Journal; 2023 – doi:10.1093/eurheartj/ehad195)

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A szívelégtelenség típusai

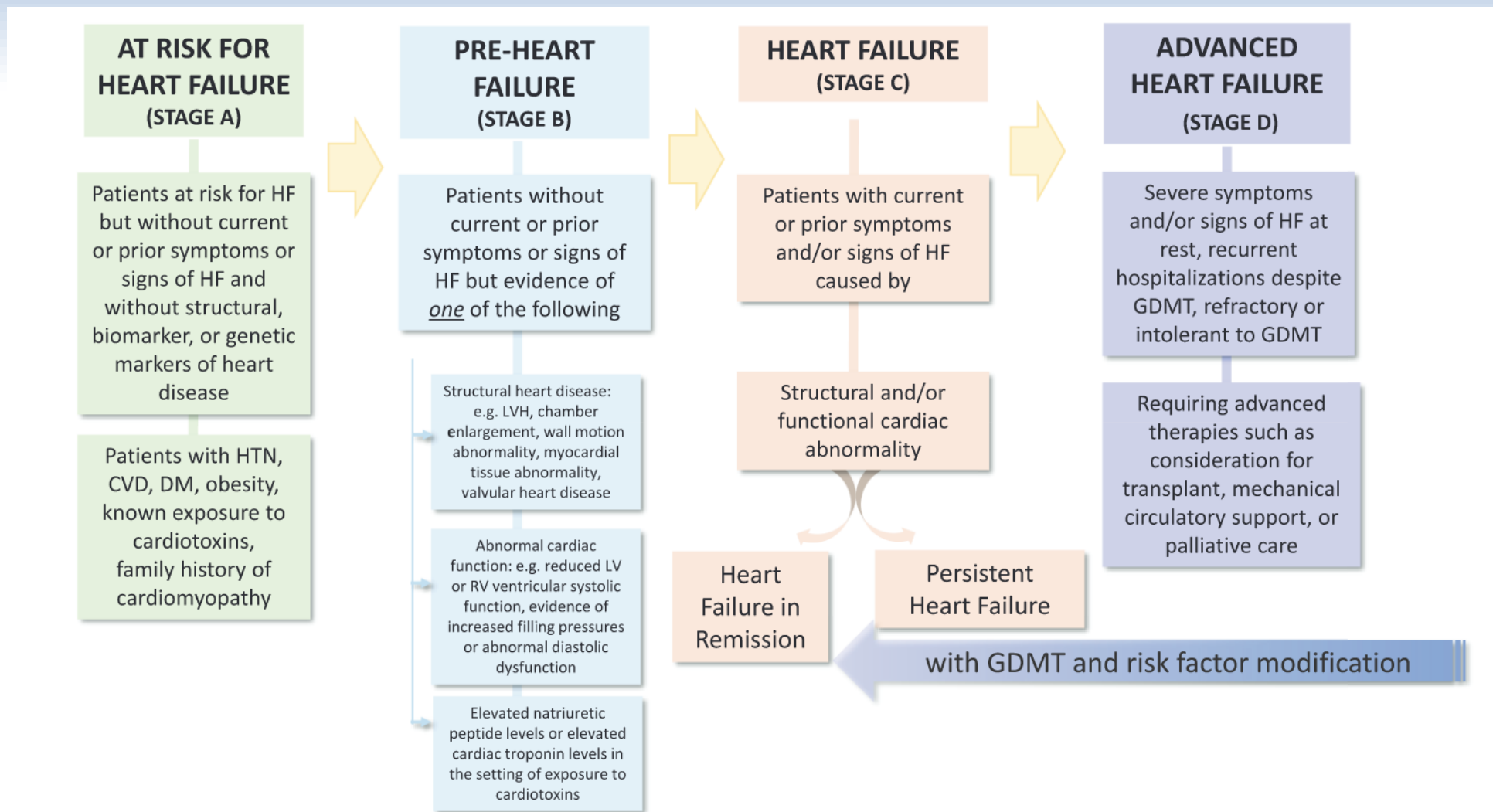
Table 1 Comparison of the ESC guidelines, AHA guidelines, and the HF universal definition

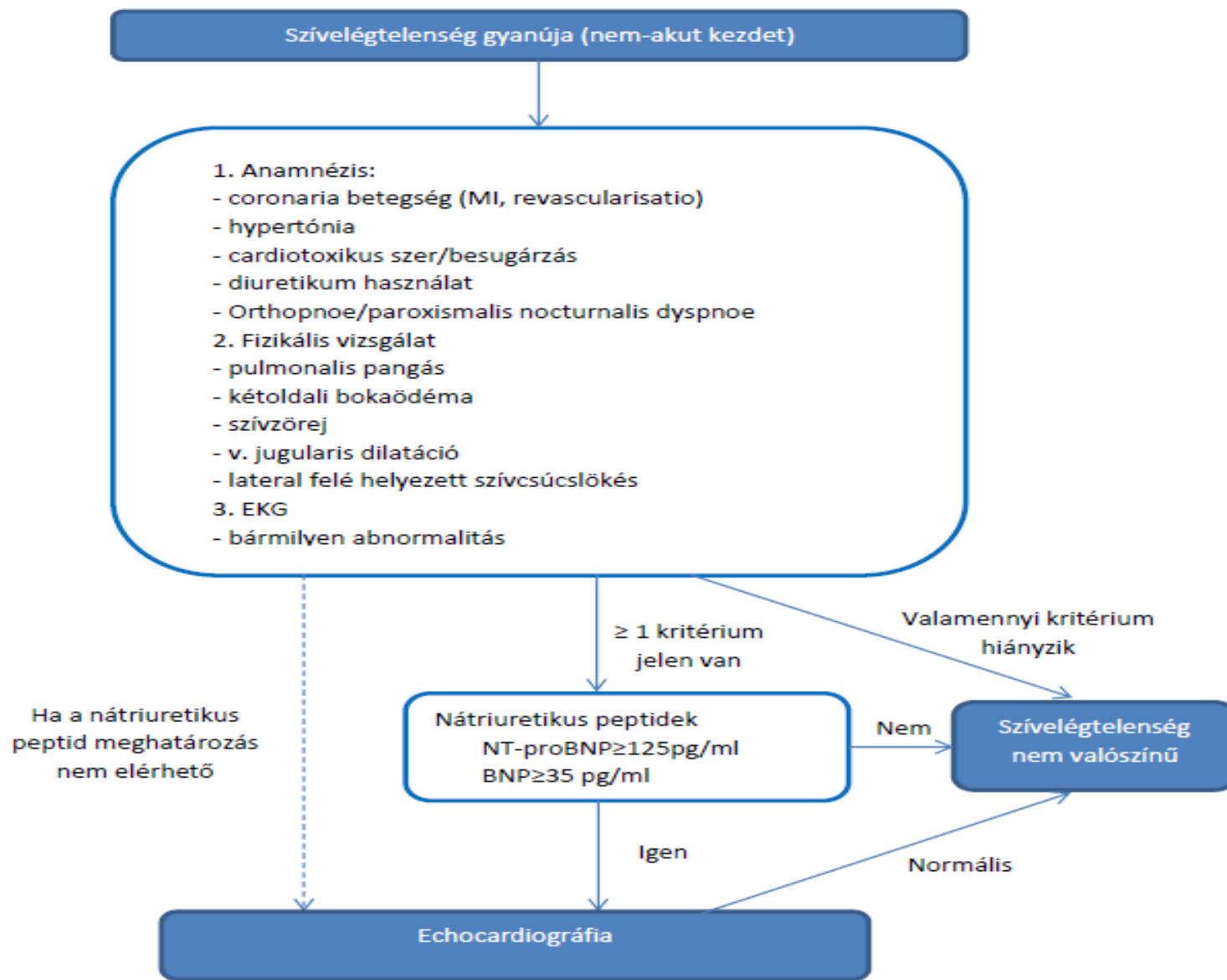
	ESC (2021)	HF universal definition (2021)	AHA (2022)
HFrEF	EF \leq 40%		
HFmrEF	EF 41-49% + sign or symptoms of HF	EF 41-49% + sign or symptoms of HF + elevated natriuretic peptides	EF 41-49% + sign or symptoms of HF + elevated left ventricle filling pressures
HFpEF	EF \geq 50% + sign or symptoms of HF + elevated natriuretic peptides		EF \geq 50% + sign or symptoms of HF + elevated left ventricle filling pressures
HFimpEF		Baseline EF \leq 40%, increase of more than 10%, subsequent EF $>$ 40%	Baseline EF \leq 40%, subsequent EF $>$ 40%

EF, ejection fraction; HF, heart failure.



A szívelégtelenség kialakulásának és progressziójának stádiumai





Klinikai tünetek



*Shortness
of breath*



*Swelling of
feet & legs*



*Chronic lack
of energy*



*Difficulty sleeping
at night due to
breathing problems*



*Swollen or tender
abdomen with
loss of appetite*



*Cough
with frothy
sputum*

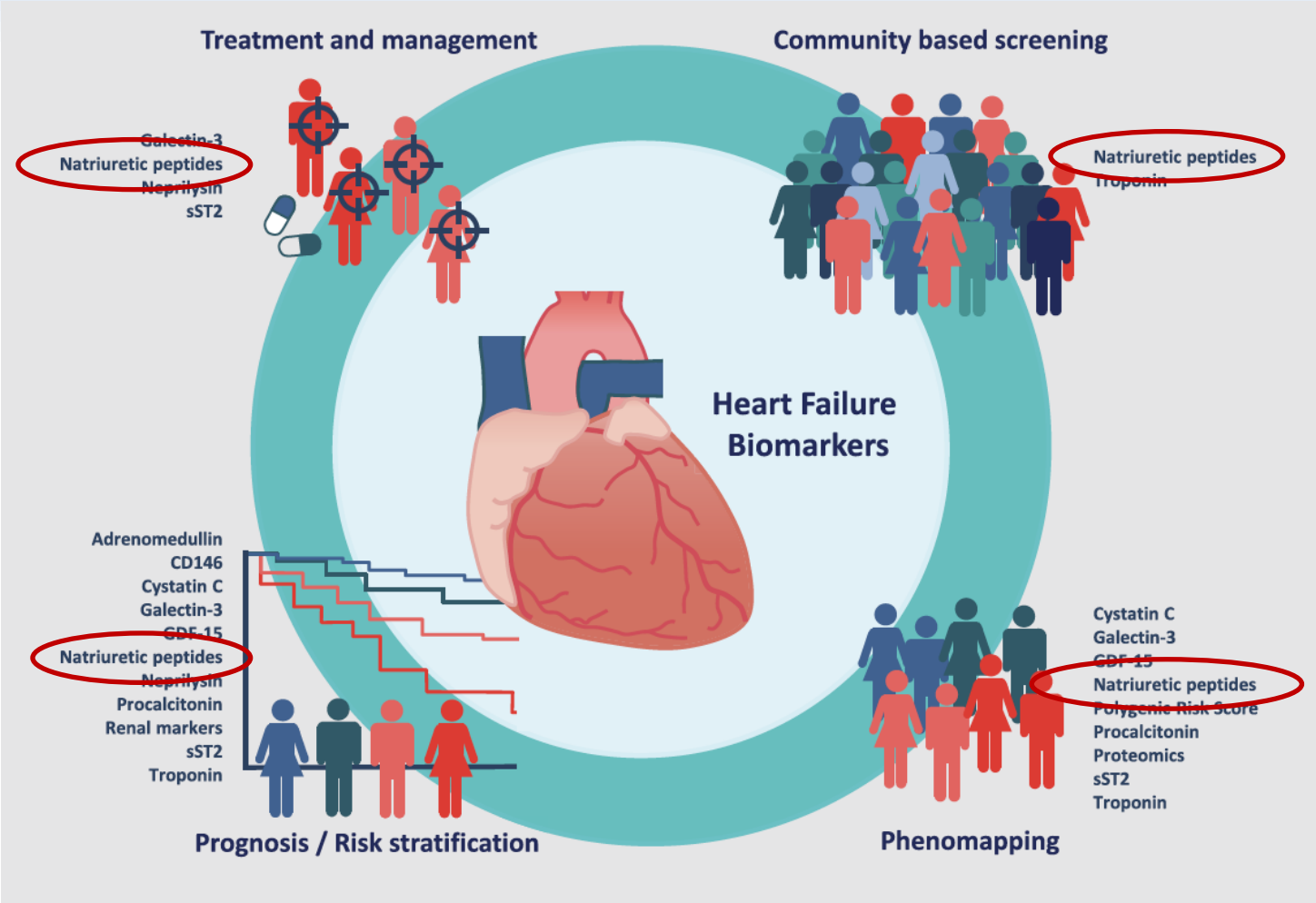


*Increased
urination
at night*



*Confusion and/or
impaired memory*

A biomarkerek alkalmazásának lehetőségei szívelégtelenségben



Kardio-onkológia

ASCC/AHA

ESC

Recommendations for Use of Biomarkers for Prevention, Initial Diagnosis, and Risk Stratification
 Referenced studies that support the recommendations are summarized in the Online Data Supplements.

COR	LOE	Recommendations
1	A	1. In patients presenting with dyspnea, measurement of B-type natriuretic peptide (BNP) or N-terminal prohormone of B-type natriuretic peptide (NT-proBNP) is useful to support a diagnosis or exclusion of HF. ¹⁻¹²
1	A	2. In patients with chronic HF, measurements of BNP or NT-proBNP levels are recommended for risk stratification. ^{11,13-29}
1	A	3. In patients hospitalized for HF, measurement of BNP or NT-proBNP levels at admission is recommended to establish prognosis. ^{11,13-19}
2a	B-R	4. In patients at risk of developing HF, BNP or NT-proBNP-based screening followed by team-based care, including a cardiovascular specialist, can be useful to prevent the development of LV dysfunction or new-onset HF. ^{30,31}
2a	B-NR	5. In patients hospitalized for HF, a predischARGE BNP or NT-proBNP level can be useful to inform the trajectory of the patient and establish a postdischarge prognosis. ^{14,17,20-29}

Recommended diagnostic tests in all patients with suspected chronic heart failure

Recommendations	Class ^a	Level ^b
BNP/NT-proBNP ^c	I	B
12-lead ECG	I	C
Transthoracic echocardiography	I	C
Chest radiography (X-ray)	I	C
Routine blood tests for comorbidities, including full blood count, urea and electrolytes, thyroid function, fasting glucose and HbA1c, lipids, iron status (TSAT and ferritin)	I	C

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Prevenió

Gyors titrálás - STRONG-HF

Recommended diagnostic tests in all patients with suspected chronic heart failure



Recommendations	Class	Level
BNP/NT-proBNP ^a	I	B
12-lead ECG	I	C
Transthoracic echocardiography	I	C
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Routine blood tests for comorbidities, including full blood count, urea and electrolytes, thyroid function, fasting glucose and HbA1c, lipids, iron status (TSAT and ferritin)	I	C

Invazív Koronarográfia

Szív MR (CMR)

Koronária CT angio (CTCA)

Terheléses EKG (ETT)

Non Invazív stress imaging (MR, Echo, SPECT, PET)

Jobbszívfél katéterezés

Szívizom biopszia (EMB)

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A kezelés céljai

* **Prevenció**

- a szívelégtelenséghez vezető betegségek megelőzése
- a szívelégtelenség progressziójának megelőzése

* **Morbiditás**

- az életminőség megtartása ill. javítása

* **Mortalitás**

- az élettartam meghosszabítása

Nem gyógyszeres kezelés

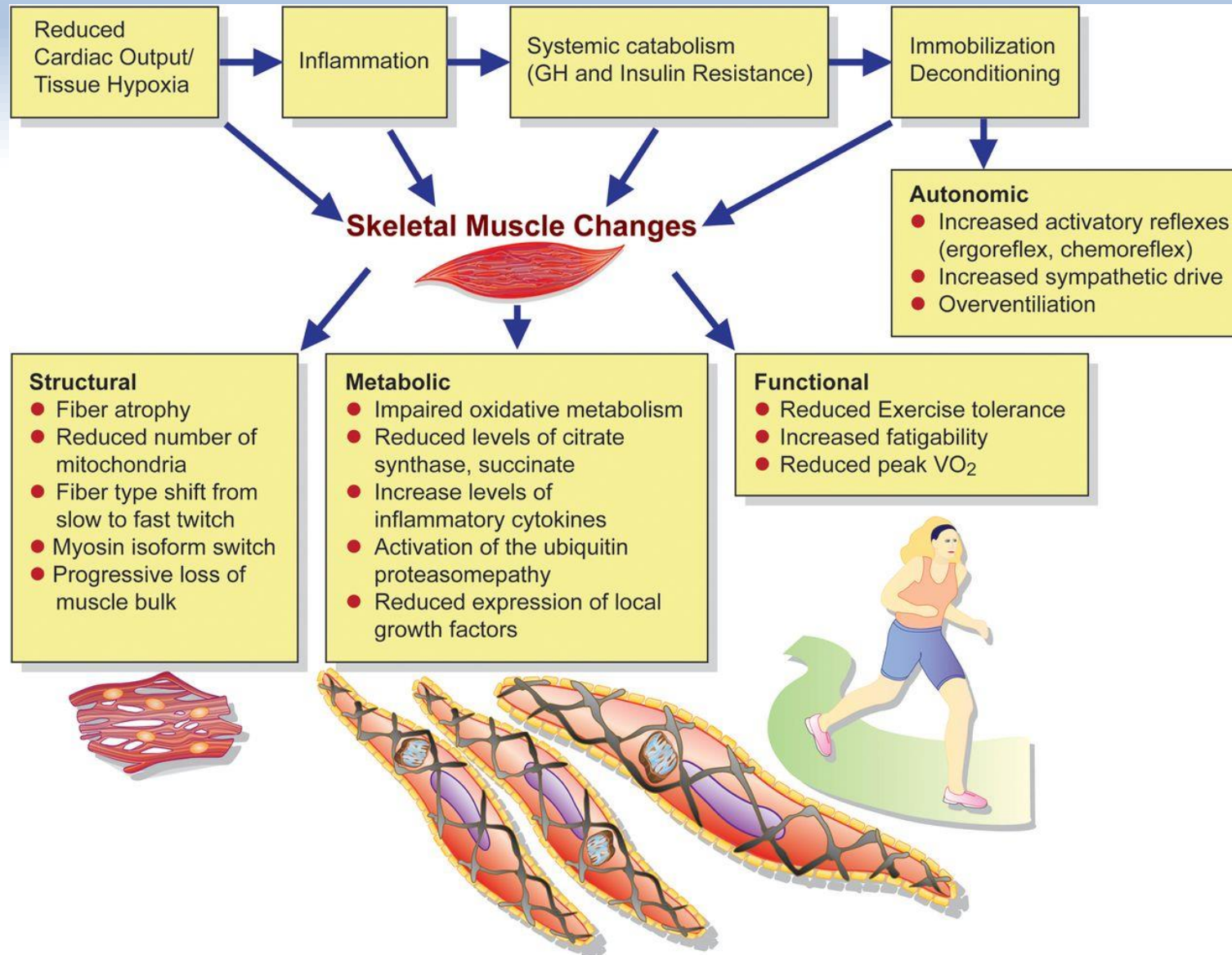
- Só- és folyadékbevitel korlátozása
- Fizikai és emocionális kímélet (akut)
- Utazás, szexuális aktivitás
- **Fizikai tréning program (krónikus)**
- Alkohol, nikotin absztinencia
- Optimalis testsúly
- Vakcináció, Kontracepció
- Adherencia, compliance
- Alvászavarok, légúti betegségek

Az alapbetegség ill. a kiváltó ok kezelése:

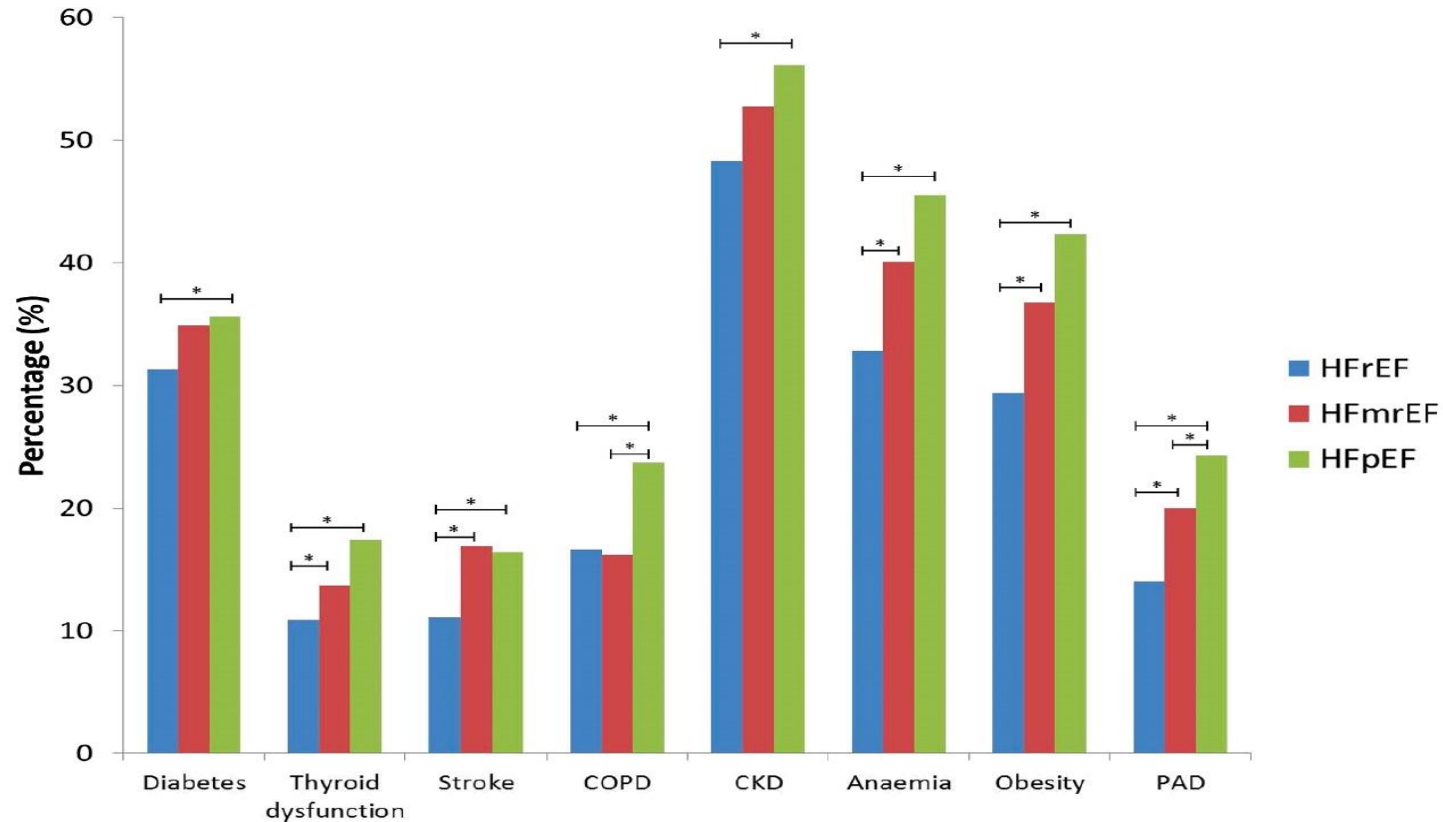
- Miokardiális iszkémia korrekciója (stunned, hibernált)
- Iatrogénia kiiktatása (nem szteroid, antidepresszáns, stb.)
- **Hipertónia, diabétesz, pajzsmirigy és egyéb társbetegségek**

A testedzésre, a multidiszciplináris gondozásra és a beteg monitorozására vonatkozó ajánlások szívelégtelenségben

Ajánlások	Osztály ^a	Szint ^b
Szívelégtelenségben ajánlott a rendszeres aerob tréning a funkcionális kapacitás és a tünetek javítása céljából.	I	A
Ajánlott a rendszeres aerob tréning stabil HFrEF betegek részére a hospitalizáció rizikójának csökkentése céljából.	I	A
Szívelégtelenségben ajánlott a betegek multidiszciplináris gondozási programban való részvétele a szívelégtelenség miatti hospitalizáció és halálozás rizikójának csökkentése céljából.	I	A

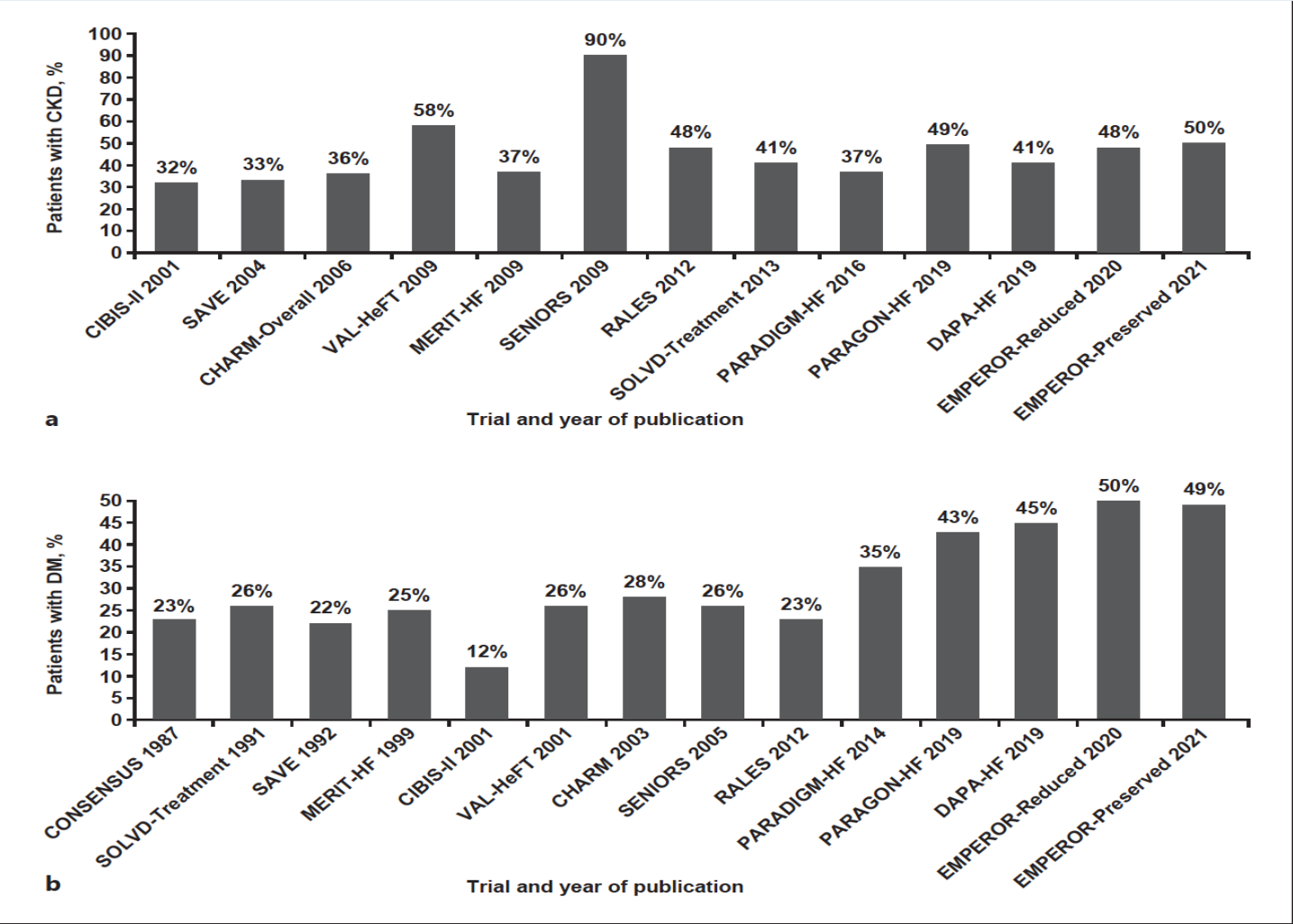


A nem kardiális társbetegségek gyakorisága, különböző típusú szívelégtelenségben



International Journal of Cardiology 2018 271, 132-139

Percentage of patients regardless of the treatment group who had CKD (a) and DM (b) in HF trials by the year of trial publication



Recommendations for the primary prevention of heart failure in patients ESC with risk factors for its development

Recommendations	Class	Level
Treatment of hypertension is recommended to prevent or delay the onset of HF, and to prevent HF hospitalizations.	I	A
Treatment with statins is recommended in patients at high risk of CV disease or with CV disease in order to prevent or delay the onset of HF, and to prevent HF hospitalizations.	I	A
SGLT2 inhibitors (canagliflozin, dapagliflozin, empagliflozin, ertugliflozin, sotagliflozin) are recommended in patients with diabetes at high risk of CV disease or with CV disease in order to prevent HF hospitalizations.	I	A
Counselling against sedentary habit, obesity, cigarette smoking, and alcohol abuse is recommended to prevent or delay the onset of HF.	I	C

CV=cardiovascular; HF=heart failure; SGLT2=sodium-glucose co-transporter 2.

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2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure
(European Heart Journal 2021 – doi:10.1093/eurheartj/ehab368)

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Recommendations for the prevention of heart failure in patients with type 2 diabetes and chronic kidney disease



Recommendations	Class	Level
In patients with T2DM and CKD, SGLT2 inhibitors (dapagliflozin or empagliflozin) are recommended to reduce the risk of HF hospitalization or CV death.	I	A
In patients with T2DM and CKD, finerenone is recommended to reduce the risk of HF hospitalization.	I	A

NEW!

NEW!

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2023 Focused update of the 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure (European Heart Journal; 2023 – doi:10.1093/eurheartj/ehad195)

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ESC 2021 HF guidelines - Diabetes



Recommendations	Class	Level
SGLT2 inhibitors (canagliflozin, dapagliflozin, empagliflozin, ertugliflozin, sotagliflozin) are recommended in patients with T2DM at risk of CV events to reduce hospitalizations for HF, major CV events, end-stage renal dysfunction, and CV death.	I	A
SGLT2 inhibitors (dapagliflozin, empagliflozin, and sotagliflozin) are recommended in patients with T2DM and HFrEF to reduce hospitalizations for HF and CV death.	I	A

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2023 Focused update of the 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure (European Heart Journal; 2023 – doi:10.1093/eurheartj/ehad195)



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HFrEF

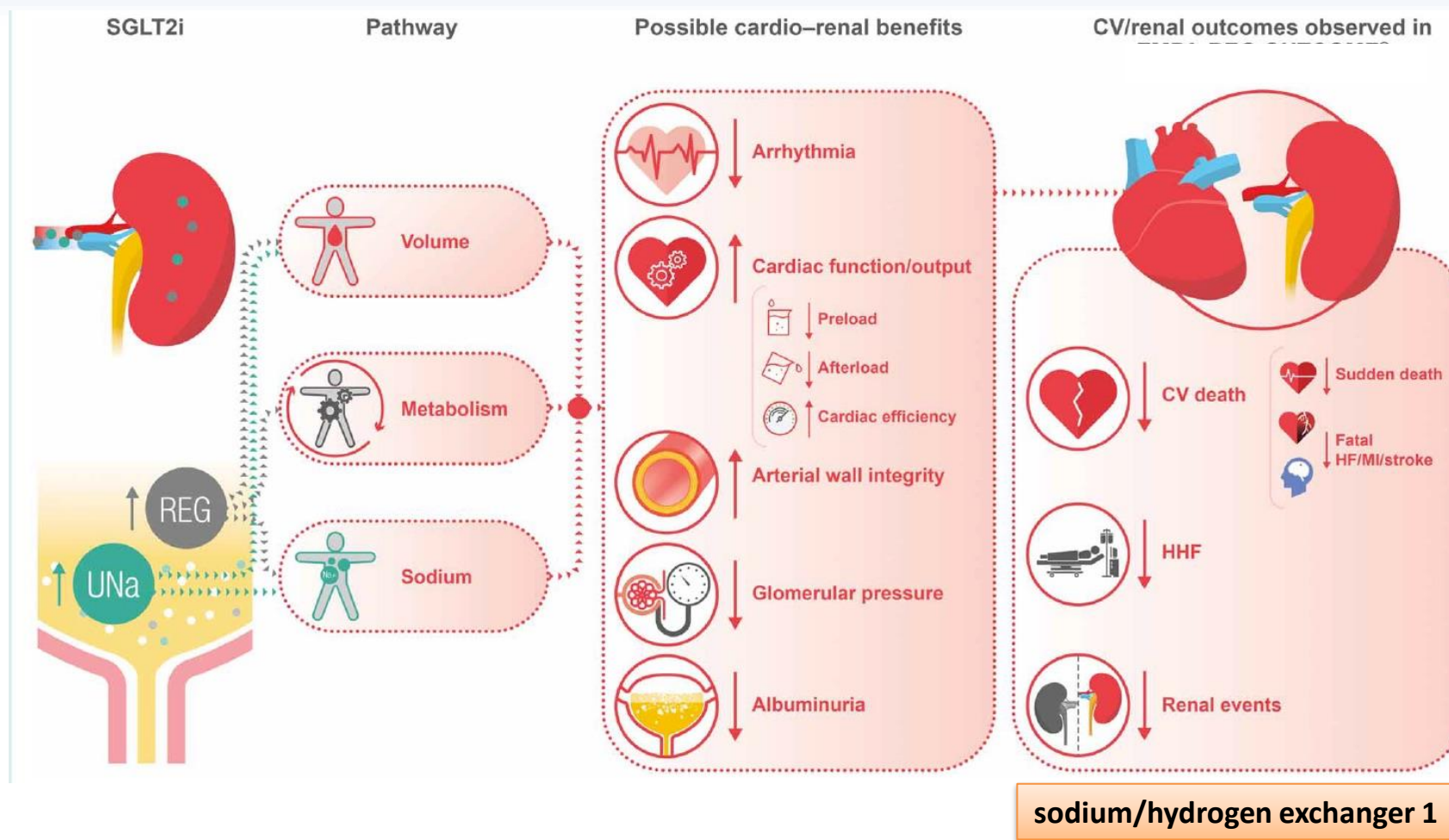


Pharmacological treatments indicated in patients with (NYHA class II-IV) heart failure with reduced ejection fraction (LVEF \leq 40%)

Recommendations	Class	Level
An ACE-I is recommended for patients with HFrEF to reduce the risk of HF hospitalization and death.	I	A
A beta-blocker is recommended for patients with stable HFrEF to reduce the risk of HF hospitalization and death.	I	A
An MRA is recommended for patients with HFrEF to reduce the risk of HF hospitalization and death.	I	A
Dapagliflozin or empagliflozin are recommended for patients with HFrEF to reduce the risk of HF hospitalization and death.	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.	I	B

ACE-I = angiotensin-converting enzyme inhibitor; HF = heart failure; HFrEF = heart failure with reduced ejection fraction; LVEF = left ventricular ejection fraction; MRA = mineralocorticoid receptor antagonist; NYHA = New York Heart Association.

Az SGLT2 gátlók hatásai

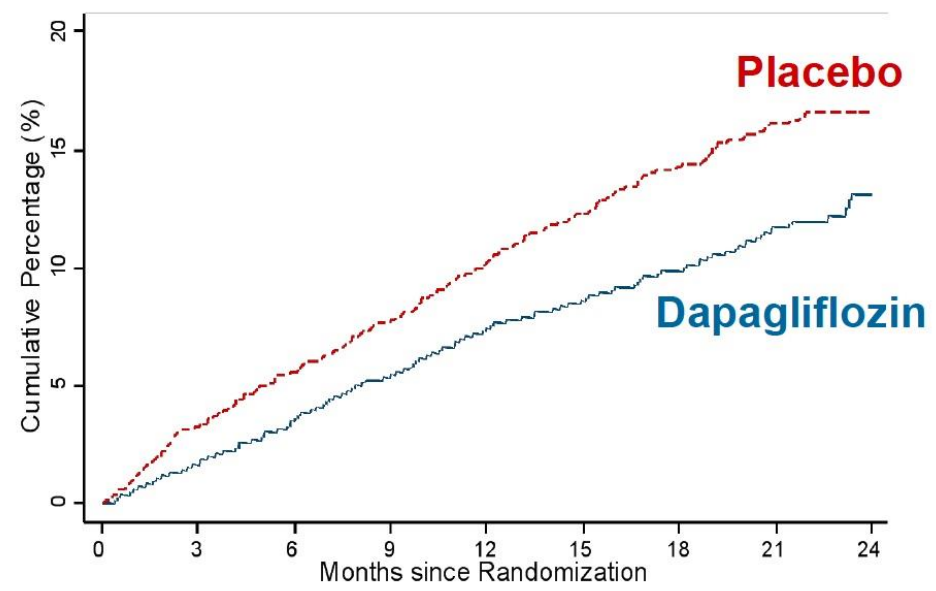


DAPA- HF trial

Components of primary outcome

Worsening HF event

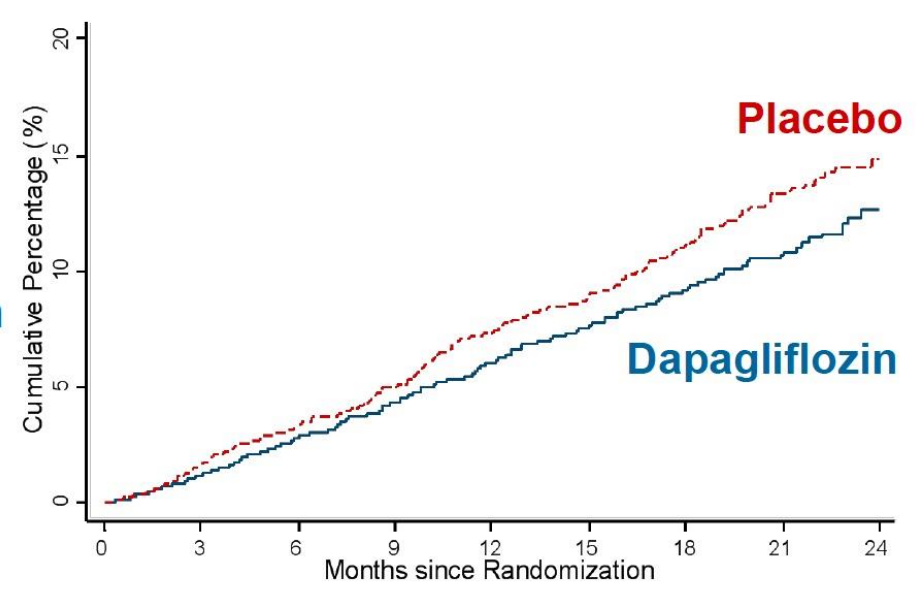
HR 0.70 (0.59, 0.83); p=0.00003



Number at Risk		0	3	6	9	12	15	18	21	24
Dapagliflozin	2373	2305	2221	2147	2002	1560	1146	612	210	
Placebo	2371	2258	2163	2075	1917	1478	1096	593	210	

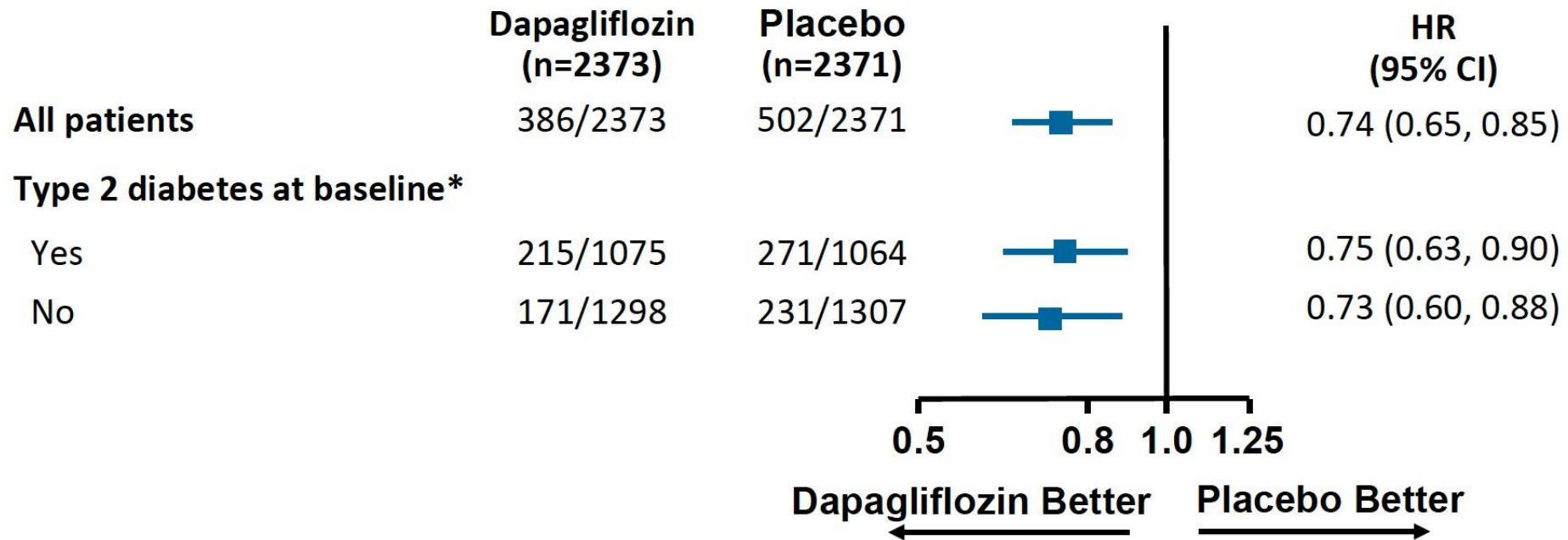
Cardiovascular death

HR 0.82 (0.69, 0.98); p=0.029



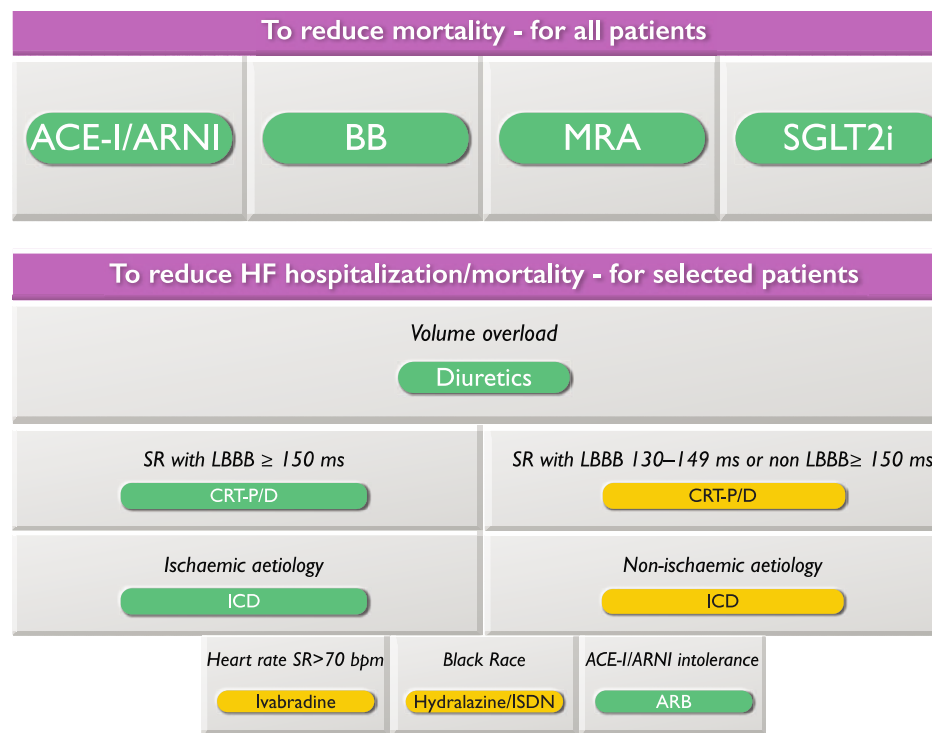
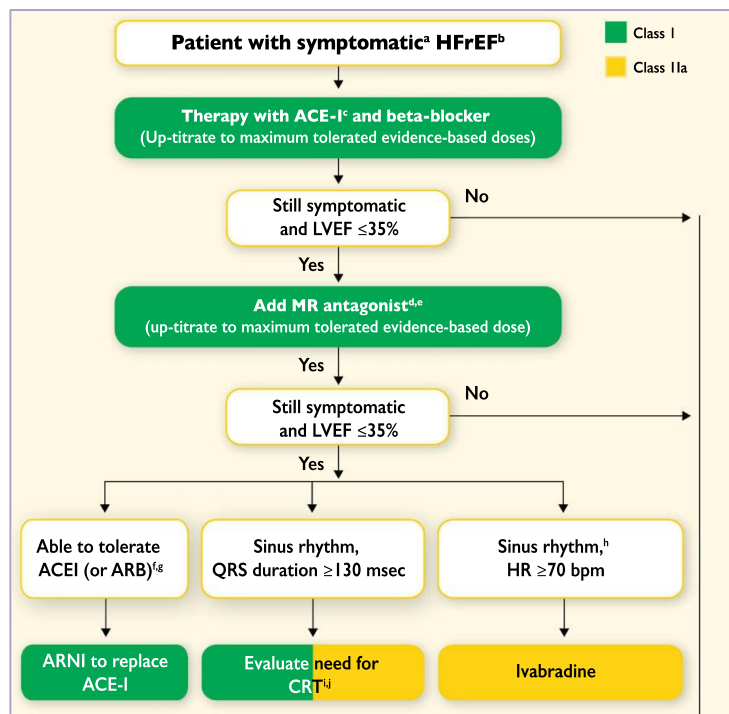
Number at Risk		0	3	6	9	12	15	18	21	24
Dapagliflozin	2373	2339	2293	2248	2127	1664	1242	671	232	
Placebo	2371	2330	2279	2230	2091	1636	1219	664	234	

No diabetes/diabetes subgroup: Primary endpoint



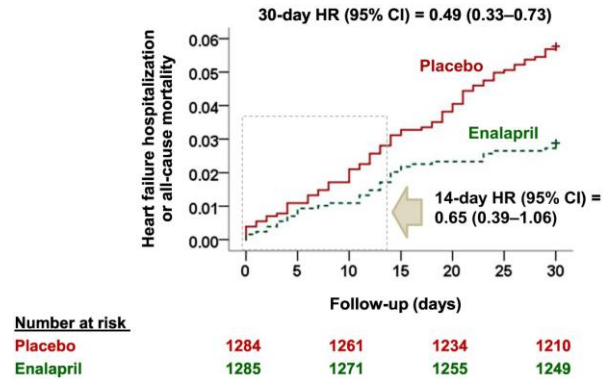
*Defined as history of type 2 diabetes or HbA1c $\geq 6.5\%$ at both enrollment and randomization visits.

A HFrEF alkezelésioritmususa

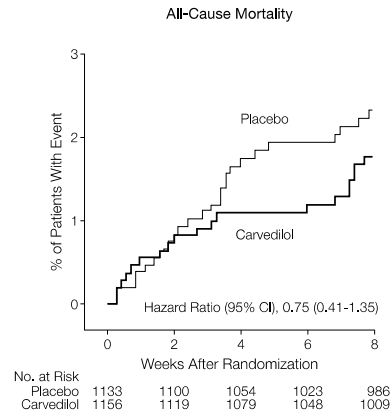


A HFrEF kezelés alapját jelentő gyógyszerek kedvező morbiditási és mortalitási hatása

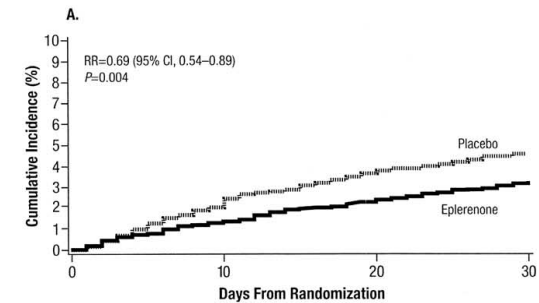
SOLVD Treatment vizsgálat¹



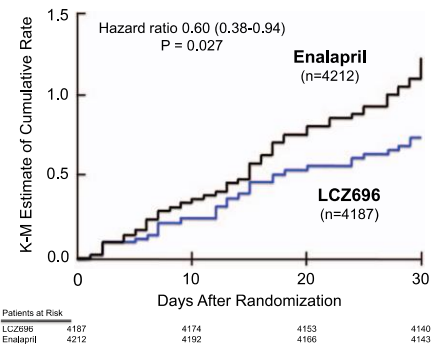
COPERNICUS vizsgálat²



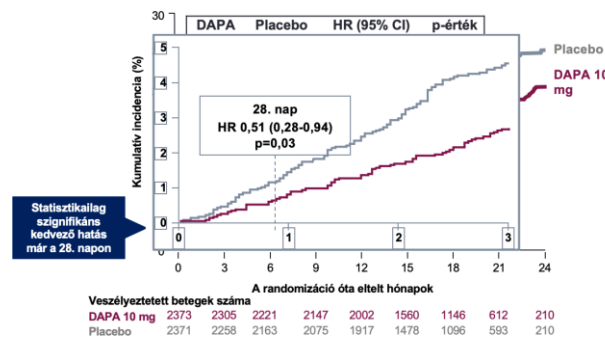
EPHESUS vizsgálat³



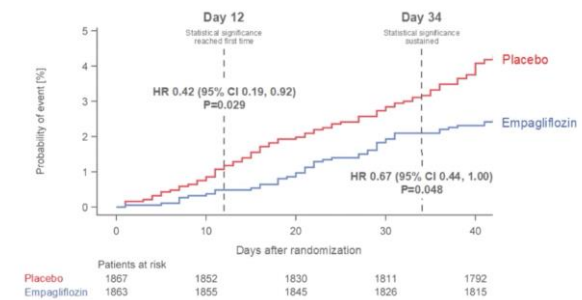
PARADIGM-HF vizsgálat⁴



DAPA-HF vizsgálat⁵

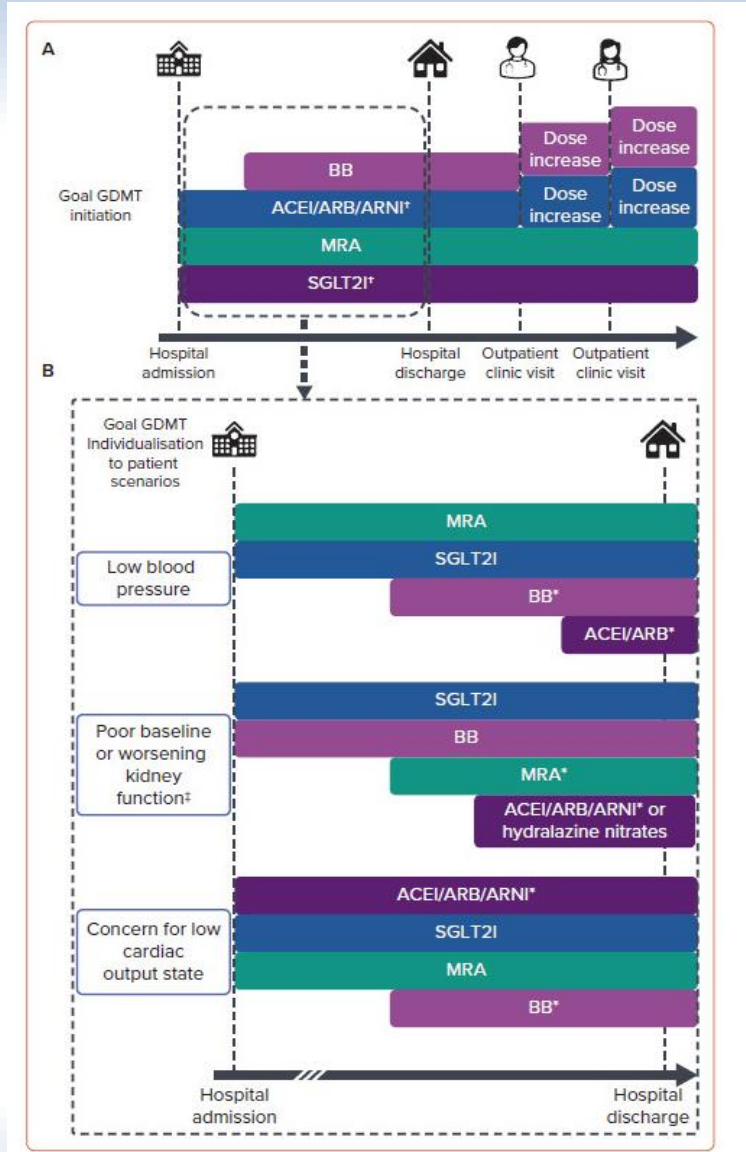


EMPEROR Reduced vizsgálat⁶



¹Lam PH et al. Am J Med 2020; 133: e25-e31. ²Krum H et al. JAMA 2003; 289: 712-718. ³Pitt B et al. J Am Coll Cardiol 2005; 46: 425-431. ⁴Packer M et al. Circulation 2015; 131: 54-61. ⁵McMurray JJV et al. N Eng J Med 2019; 381: 1995-2008. ⁶Packer M et al. N Eng J Med 2020; 383: 1413-1424

A GDMT egyénre szabása



A komorbiditások és a fenotípus szerepe



Estimating lifetime benefits of comprehensive disease-modifying pharmacological therapies in patients with HFrEF

How to implement GDMT...

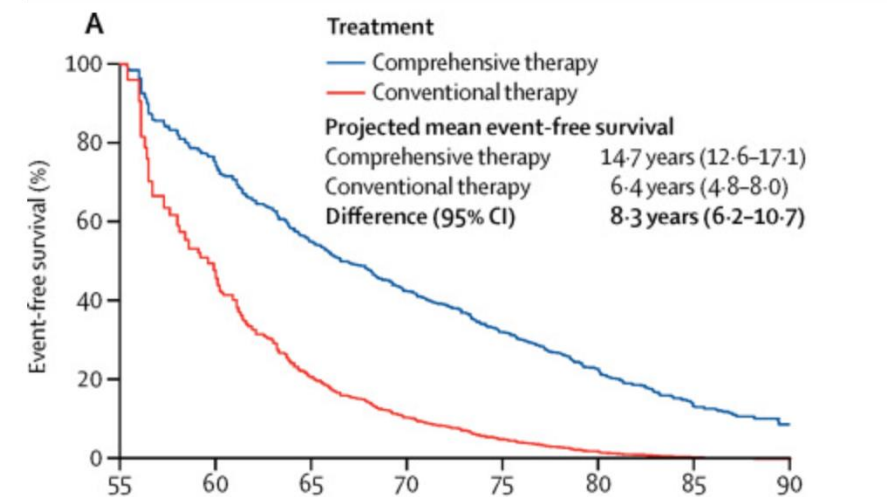
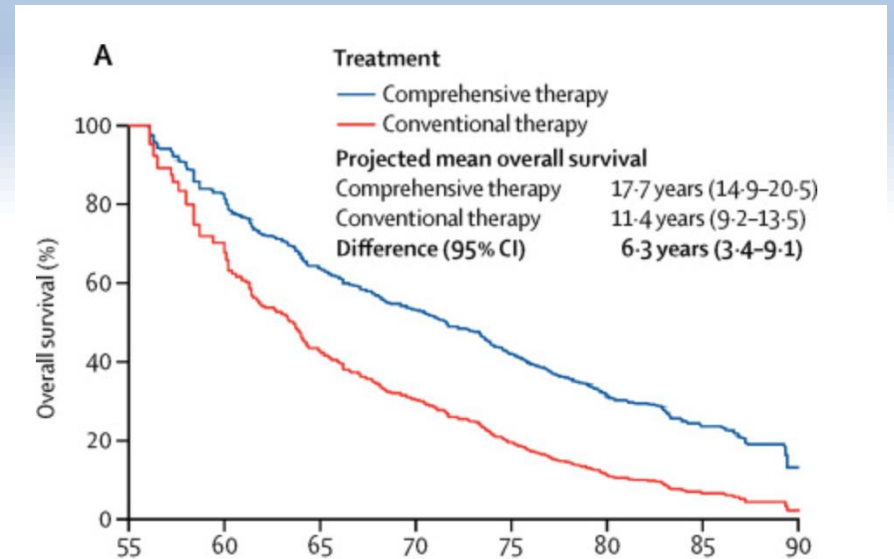
Issue 1. Initiate & Switch

Treatment algorithm for GDMT, including novel therapies (*Figures 2 and 3*)

Issue 2. Titration

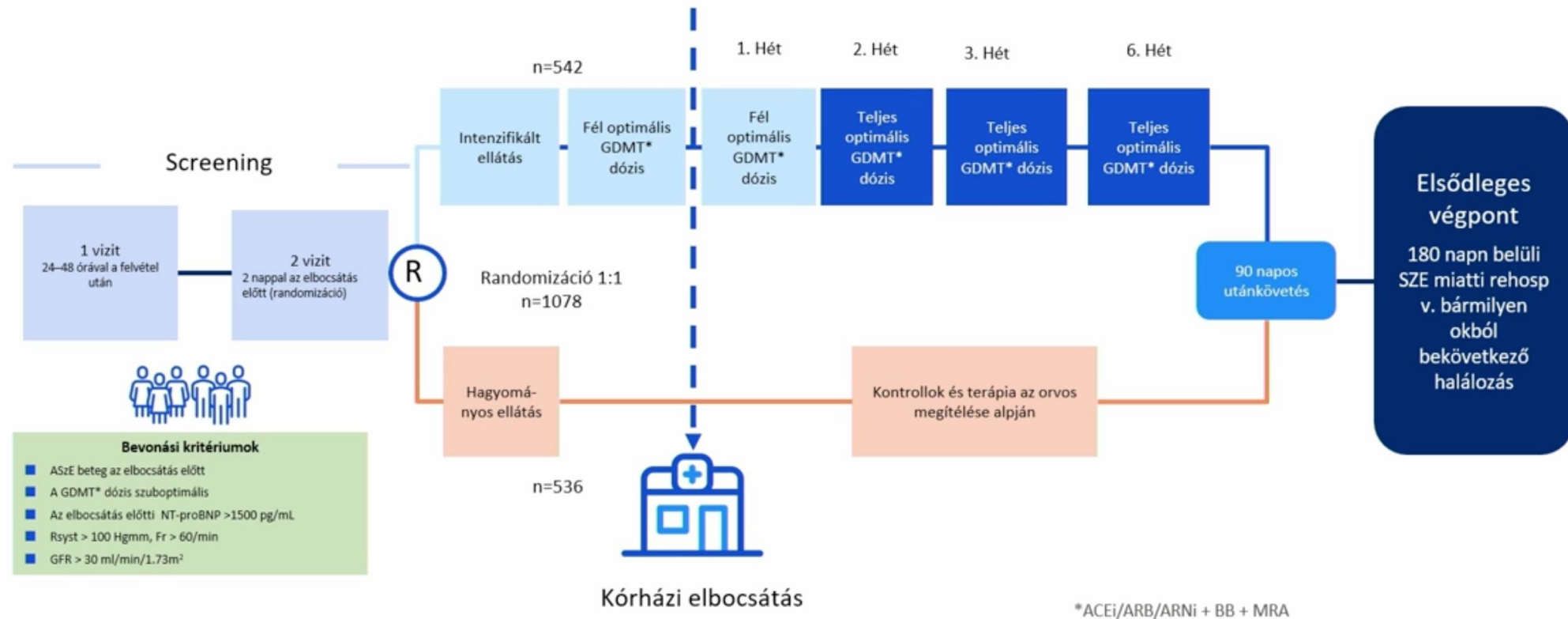
Target doses, indications, contraindications, and other considerations of select GDMT for HFrEF (*Tables 1, 2, 3, 4, 5*)

Considerations for monitoring



B

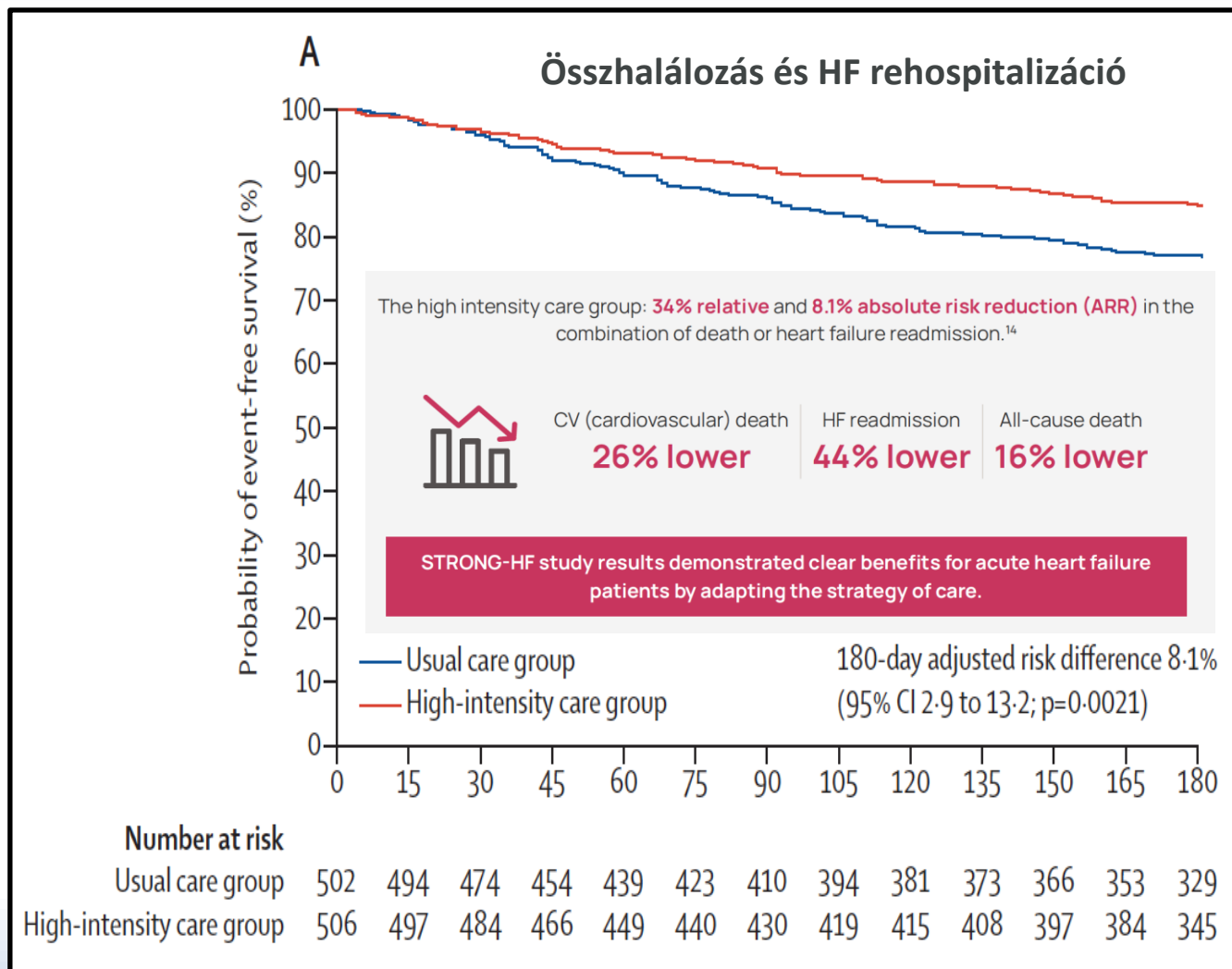
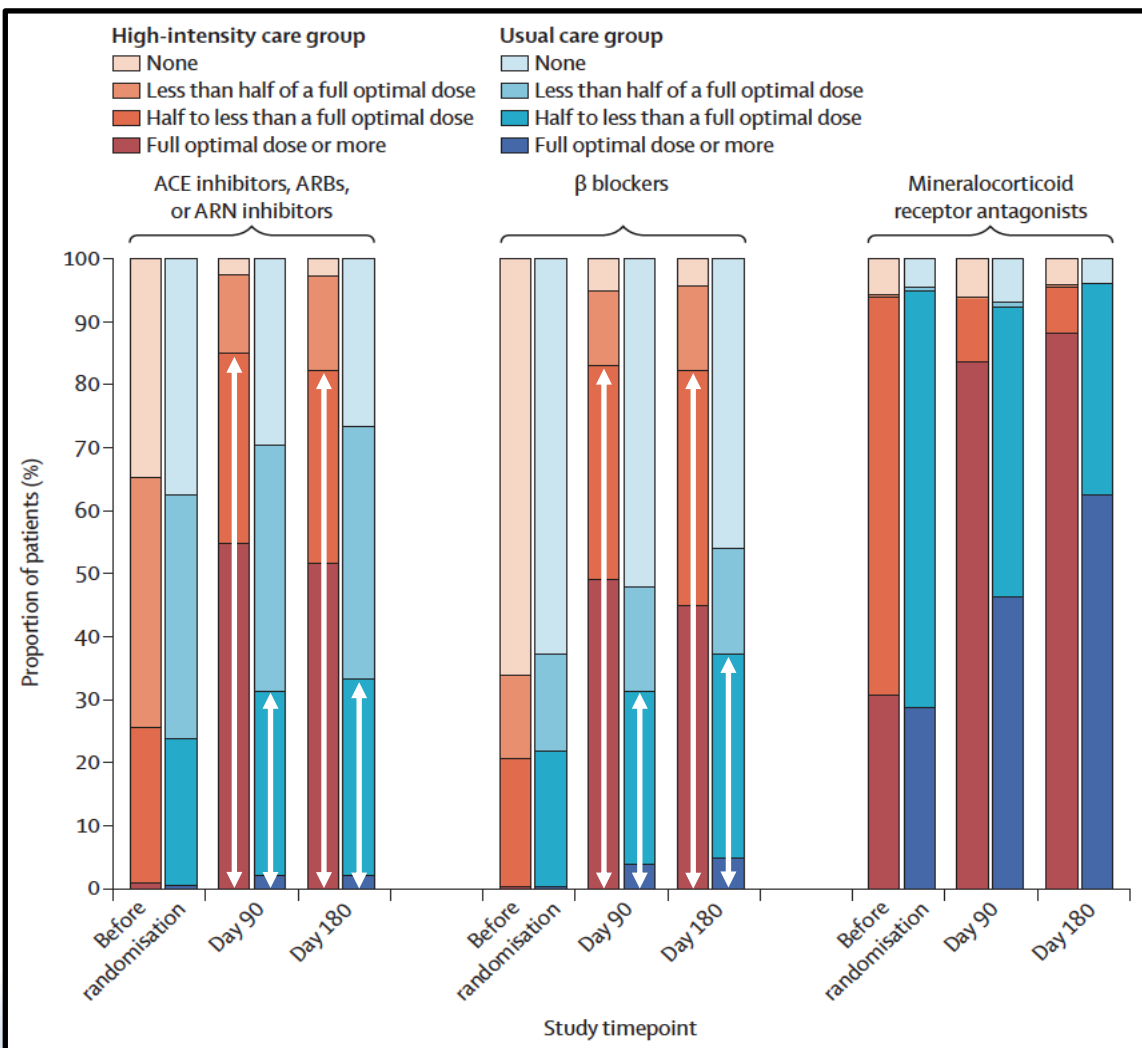
STRONG-HF vizsgálat: study design



1. Kimmoun A et al. Eur J Heart Fail 2019; 21: 1459–1467. 2. Gotter G et al. Eur J Heart Fail 2021; 23: 1981-1982. 3. Mebazaa A et al. Lancet. 2022; 400:1938-1952.

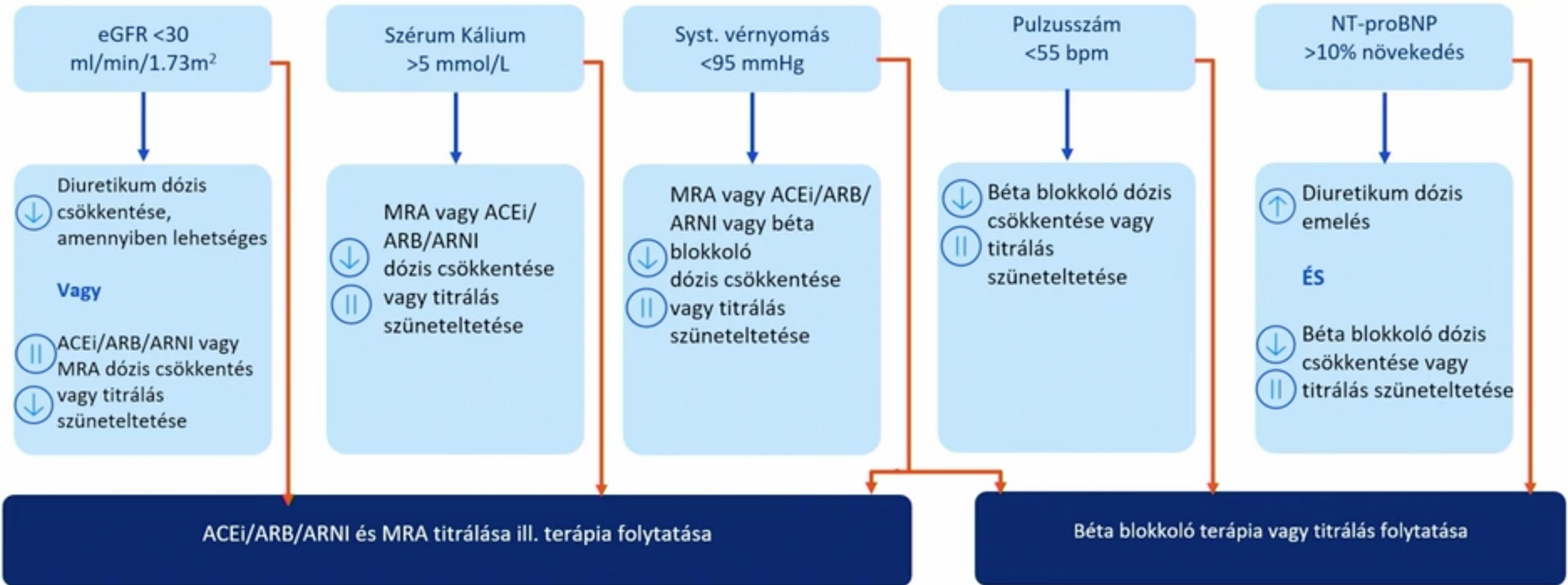
STRONG-HF vizsgálat bizonyította az intenzív kezelési stratégia jelentőségét

Akut HF miatt felvett betegeknél az irányelv szerint javasolt gyógyszerek gyors feltitrálását és szoros követést magában foglaló intenzív kezelési stratégia javította az életminőséget és csökkentette a halálozás vagy HF miatti ismételt kórházi felvétel rizikóját a hagyományos gondozáshoz képest

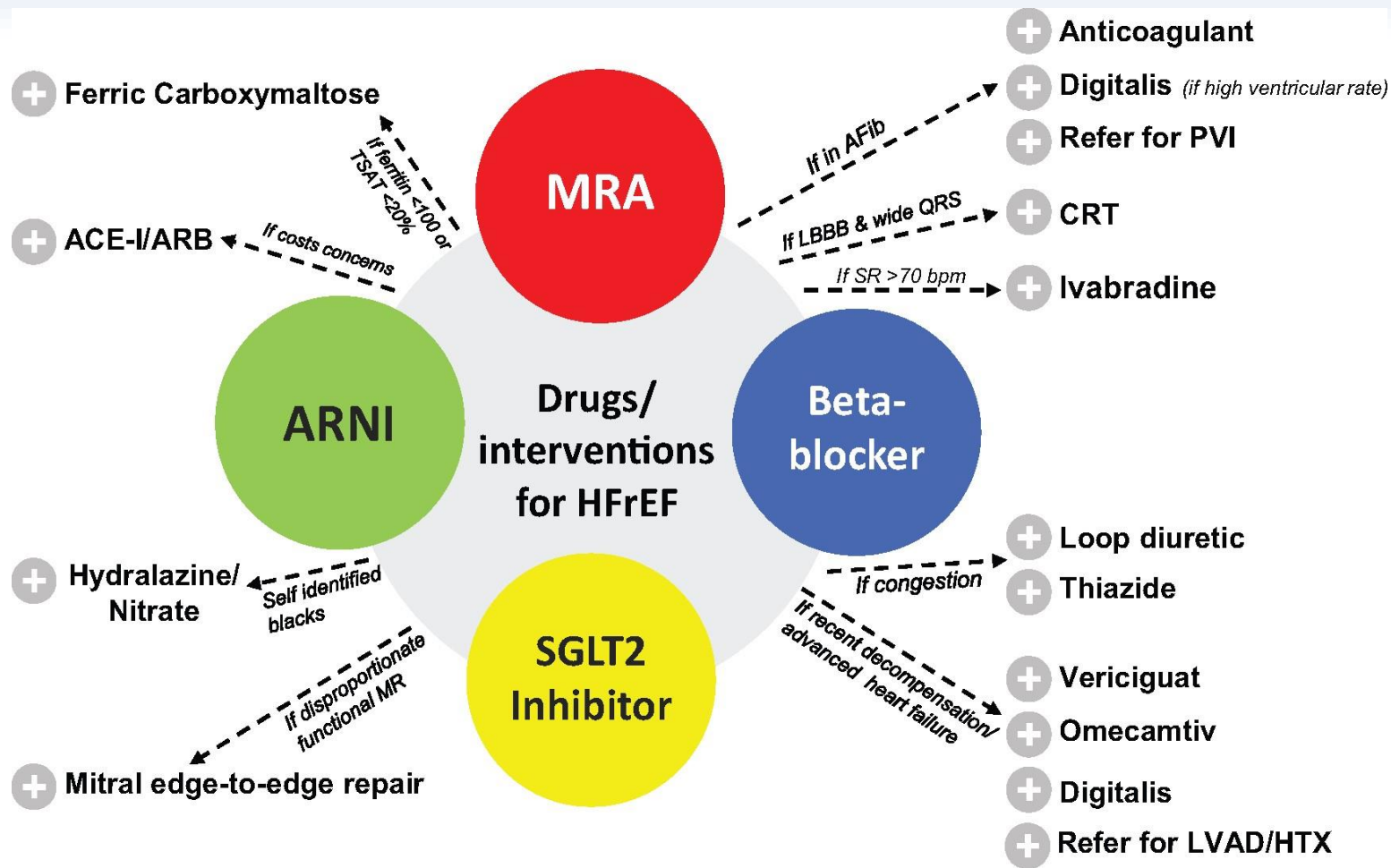


STRONG-HF vizsgálat: a GDMT feltitrálása

— Igen — Nem



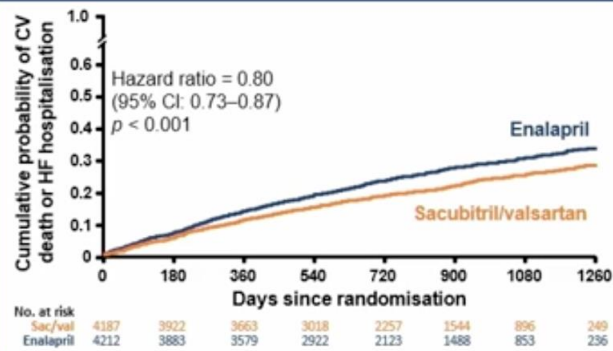
Gyógyszerek, intervenciók és eszközök a (HF_rEF) kezelésében



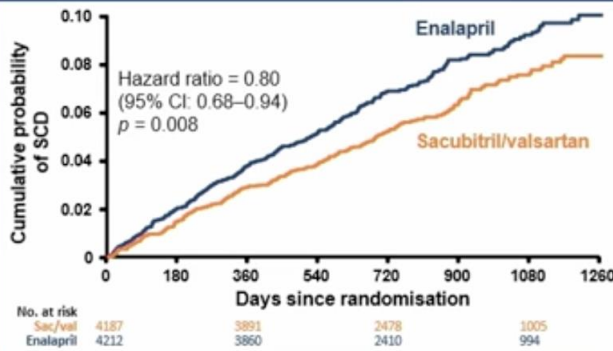
A modern kezelés fontossága ARNI vs ACEi



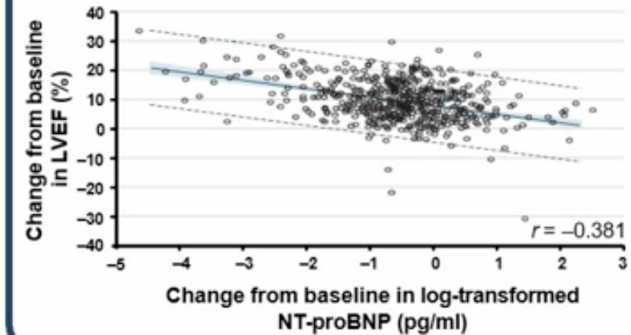
Reduced risk of death and hospitalisation for heart failure¹



Reduction in sudden cardiac death²



Reverse cardiac remodelling³



Renal benefits

Slower rate of decrease in eGFR and improved CV outcomes even in patients with chronic kidney disease⁴



Reduction in investigator-reported ventricular arrhythmias⁵

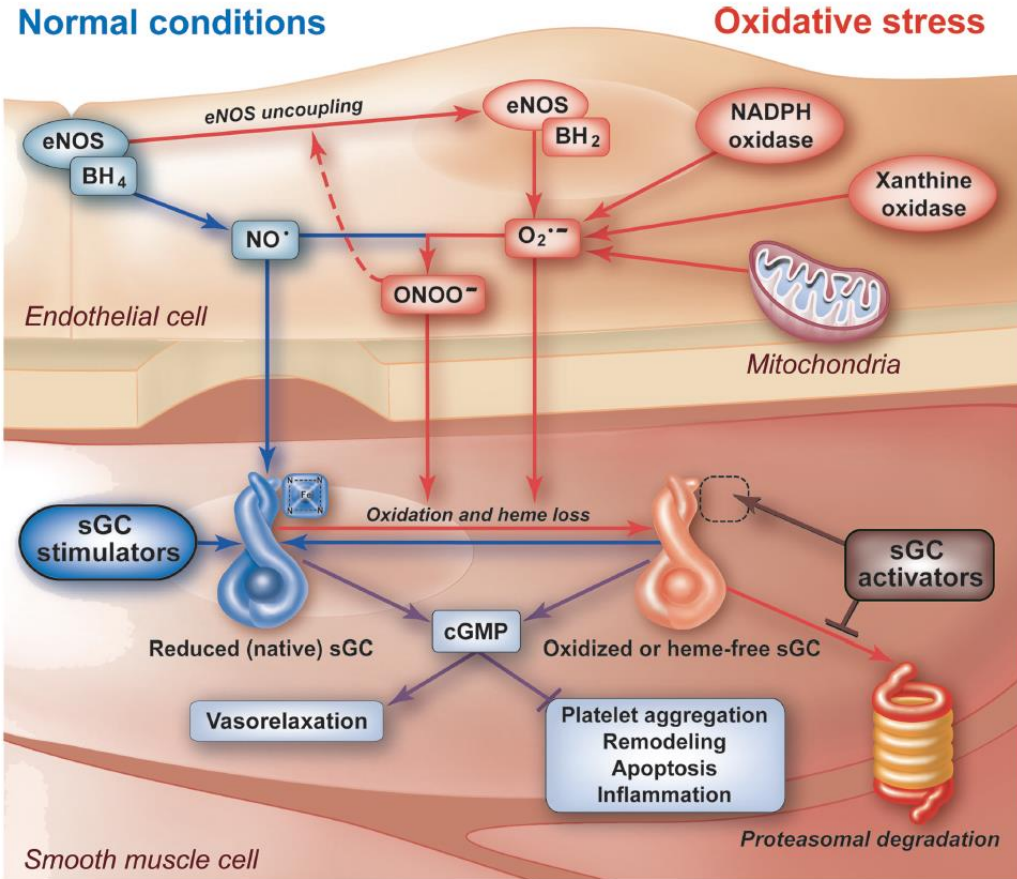
ICD
CRT
MR

Szelektált HFrEF beteg számára javasolt vagy megfontolást érdemlő gyógyszeres kezelési lehetőségek

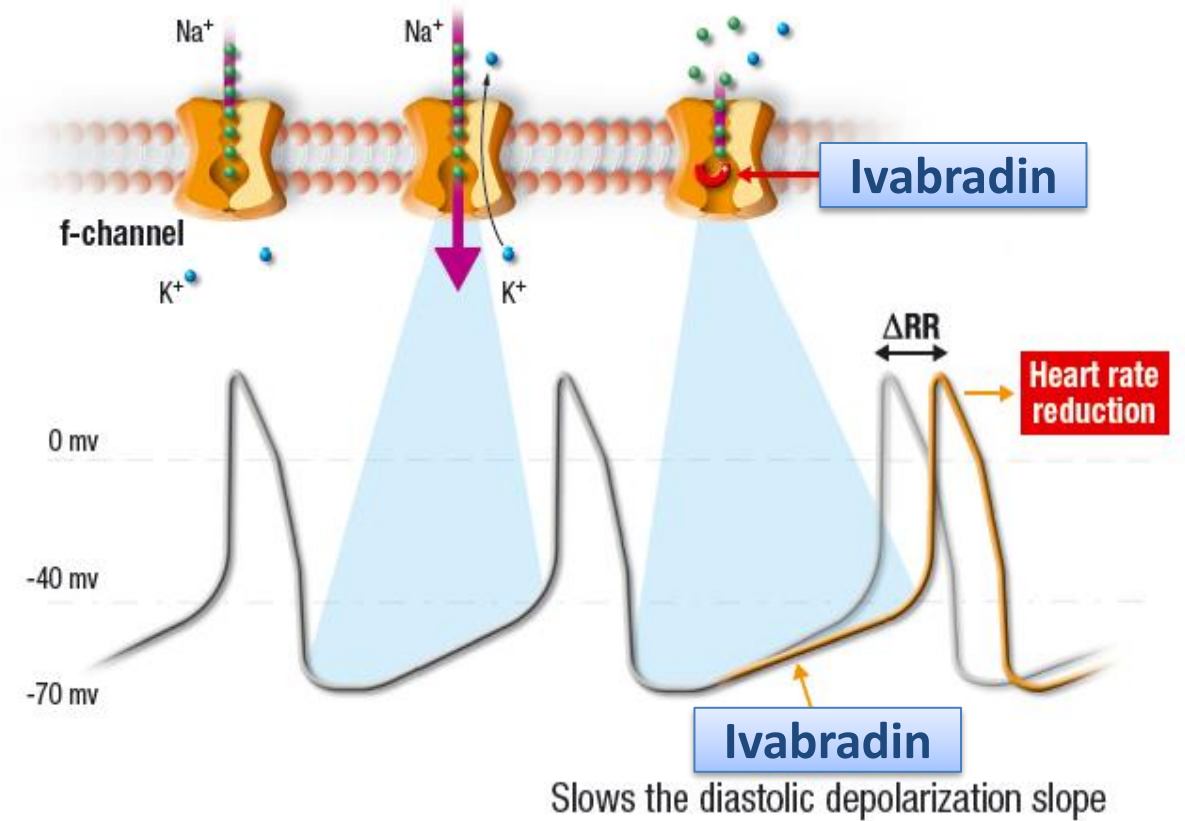
Recommendations	Class ^a	Level ^b
Loop diuretics		
Diuretics are recommended in patients with HFrEF with signs and/or symptoms of congestion to alleviate HF symptoms, improve exercise capacity, and reduce HF hospitalizations. ¹³⁷	I	C
ARB		
An ARB ^c is recommended to reduce the risk of HF hospitalization and CV death in symptomatic patients unable to tolerate an ACE-I or ARNI (patients should also receive a beta-blocker and an MRA). ¹³⁸	I	B
β-channel inhibitor		
Ivabradine should be considered in symptomatic patients with LVEF ≤35%, in SR and a resting heart rate ≥70 b.p.m. despite treatment with an evidence-based dose of beta-blocker (or maximum tolerated dose below that), ACE-I/(or ARNI), and an MRA, to reduce the risk of HF hospitalization and CV death. ¹³⁹	IIa	B
Ivabradine should be considered in symptomatic patients with LVEF ≤35%, in SR and a resting heart rate ≥70 b.p.m. who are unable to tolerate or have contraindications for a beta-blocker to reduce the risk of HF hospitalization and CV death. Patients should also receive an ACE-I (or ARNI) and an MRA. ¹⁴⁰	IIa	C

Recommendations	Class ^a	Level ^b
Soluble guanylate cyclase receptor stimulator		
Vericiguat may be considered in patients in NYHA class II–IV who have had worsening HF despite treatment with an ACE-I (or ARNI), a beta-blocker and an MRA to reduce the risk of CV mortality or HF hospitalization. ¹⁴¹	IIIb	B
Hydralazine and isosorbide dinitrate		
Hydralazine and isosorbide dinitrate should be considered in self-identified black patients with LVEF ≤35% or with an LVEF <45% combined with a dilated left ventricle in NYHA class III–IV despite treatment with an ACE-I (or ARNI), a beta-blocker and an MRA to reduce the risk of HF hospitalization and death. ¹⁴²	IIa	B
Hydralazine and isosorbide dinitrate may be considered in patients with symptomatic HFrEF who cannot tolerate any of an ACE-I, an ARB, or ARNI (or they are contraindicated) to reduce the risk of death. ¹⁴³	IIIb	B
Digoxin		
Digoxin may be considered in patients with symptomatic HFrEF in sinus rhythm despite treatment with an ACE-I (or ARNI), a beta-blocker and an MRA, to reduce the risk of hospitalization (both all-cause and HF hospitalizations). ¹⁴⁴	IIIb	B

Vericiguat - sGC stimulator

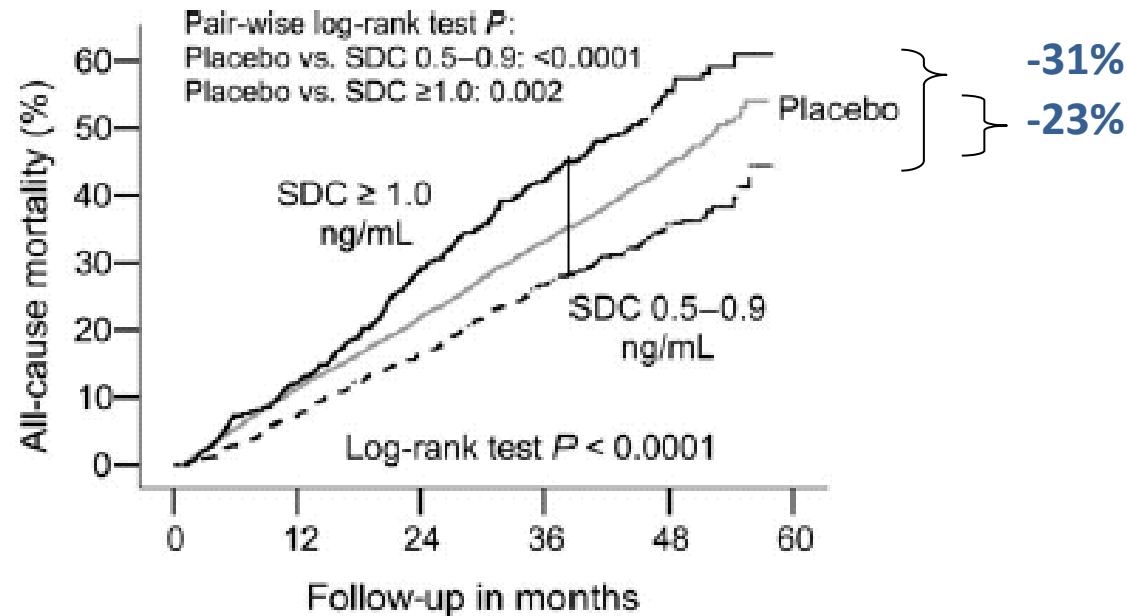


Ivabradin



DIG post-hoc analízis

5554 beteg, 1687 SeDig szint méréssel, 3861 beteg placebo
kezeléssel



No. at risk	0 month	12 months	24 months	36 months	48 months
Placebo	3861	3439	3080	2166	835
SDC 0.5–0.9	982	909	826	740	375
SDC \geq 1.0	705	623	524	455	219

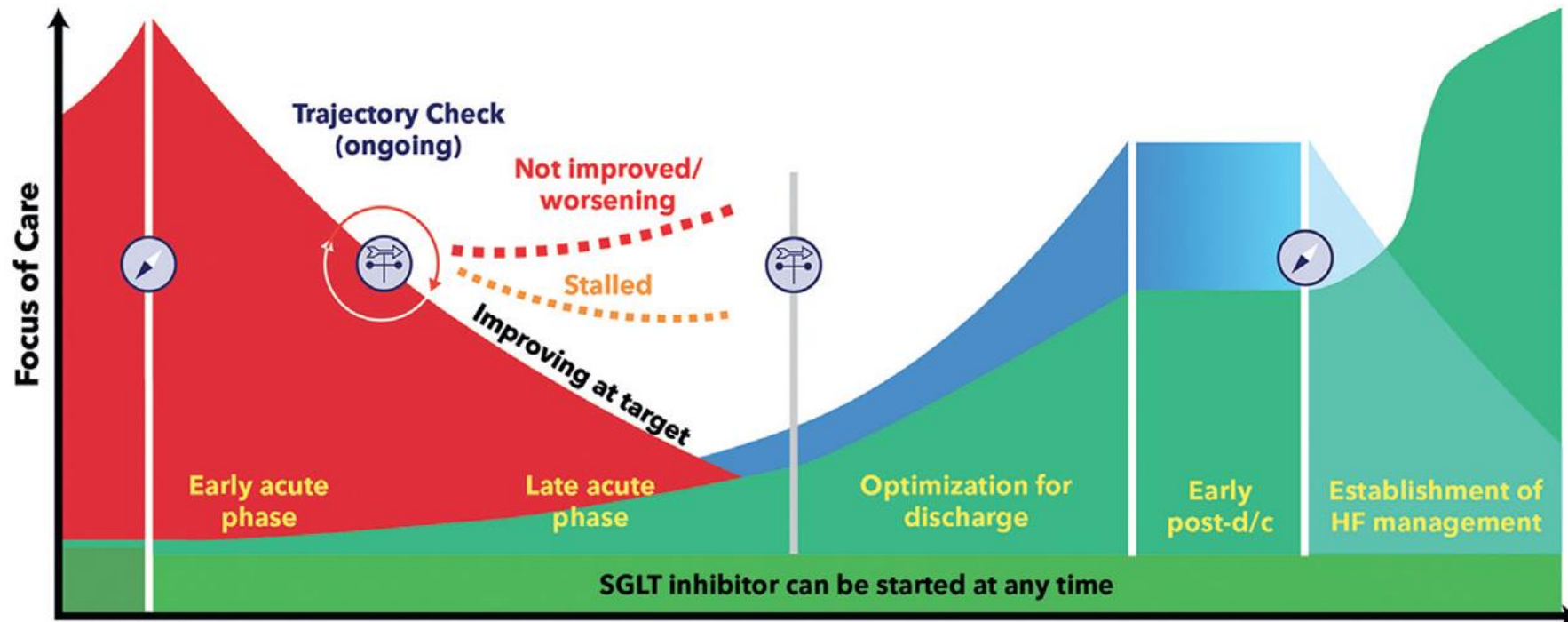
Figure 1 Kaplan-Meier plots for cumulative risk of death due to all causes by SDC.

Recommendation Table 5 — Recommendations for the management of iron deficiency in patients with heart failure

Recommendations	Class^a	Level^b
Intravenous iron supplementation is recommended in symptomatic patients with HFrEF and HFmrEF, and iron deficiency, to alleviate HF symptoms and improve quality of life. ^c 12,41,47–49	I	A
Intravenous iron supplementation with ferric carboxymaltose or ferric derisomaltose should be considered in symptomatic patients with HFrEF and HFmrEF, and iron deficiency, to reduce the risk of HF hospitalization. ^c 12,41,43–46	IIa	A

© ESC 2023

Pathway Summary Graphic—Clinical Course of Heart Failure



- Admission**
- Clinical decompensation
 - Discharge coordination
 - Optimization of guideline-directed therapy
 - Ongoing optimization of outpatient care
 - ⊗ Evaluation of short-term trajectory
 - ⊙ Evaluation of long-term trajectory
- Transition to Oral Therapies**
- Discharge**
- First Follow-up Visit**

Recommendations for pre-discharge and early post-discharge follow-up of patients hospitalized for acute heart failure



Recommendations	Class	Level
An intensive strategy of initiation and rapid up-titration of evidence-based treatment before discharge and during frequent and careful follow-up visits in the first 6 weeks following a HF hospitalization is recommended to reduce the risk of HF rehospitalization or death.	I	B
<ul style="list-style-type: none">- In STRONG-HF, the use of ACEi/ARB/ARNI, beta-blockers and MRA was evaluated in patients with HFrEF, HFmrEF and HFpEF.- Although STRONG-HF was based only on triple therapy with neurohormonal modulators, this recommendation also includes empaglifozin or dapaglifozin based on recent evidence		



6 Pre-discharge and early (1-2 weeks) follow-up visit after HF hospitalization

www.escardio.org/guidelines

2023 Focused update of the 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure (European Heart Journal; 2023 – doi:10.1093/eurheartj/ehad195)

©ESC

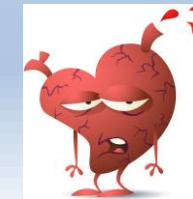
NEW

My personal approach

ENACT provided RCT support to use spot-natriuresis in AHF as a safe, reliable, easily obtainable, inexpensive, readily available and implementable marker to assess the response and to guide diuretic treatment

Acute HF			Vulnerable Phase	Chronic HF	
Day 1	Day 2	Day 3			
Natriuresis based loop diuretic dosing (ESC-HF guidelines) + ENACT			Switch IV to oral loop diuretics (only discharge when dry)	Lowest amount of loop diuretics and try to wean off	Loop diuretics
Acetazolamide 500 mg IV daily (ADVOR)			SGLT2i (EMPULSE, SOLOIST-WHF)	SGLT2i (DAPA-HF, EMPORER-Reduced, EMPORER-Preserved, DELIVER)	Proximal working agents
Continue + try to uptitrate neurohumoral blockers (STRONG-HF, ESC-HF guidelines)					Neurohumoral blockers

Mikor irányítsuk a beteget szívelégtelenség specialisához?



“I NEED HELP”

Remember acronym to assist in decision making for referral to advanced heart failure specialist:

I-NEED-HELP (also see *Table 6*)

I: Intravenous inotropes

N: NYHA IIIB/IV or persistently elevated natriuretic peptides

E: End-organ dysfunction

E: Ejection fraction $\leq 35\%$

D: Defibrillator shocks

H: Hospitalizations > 1

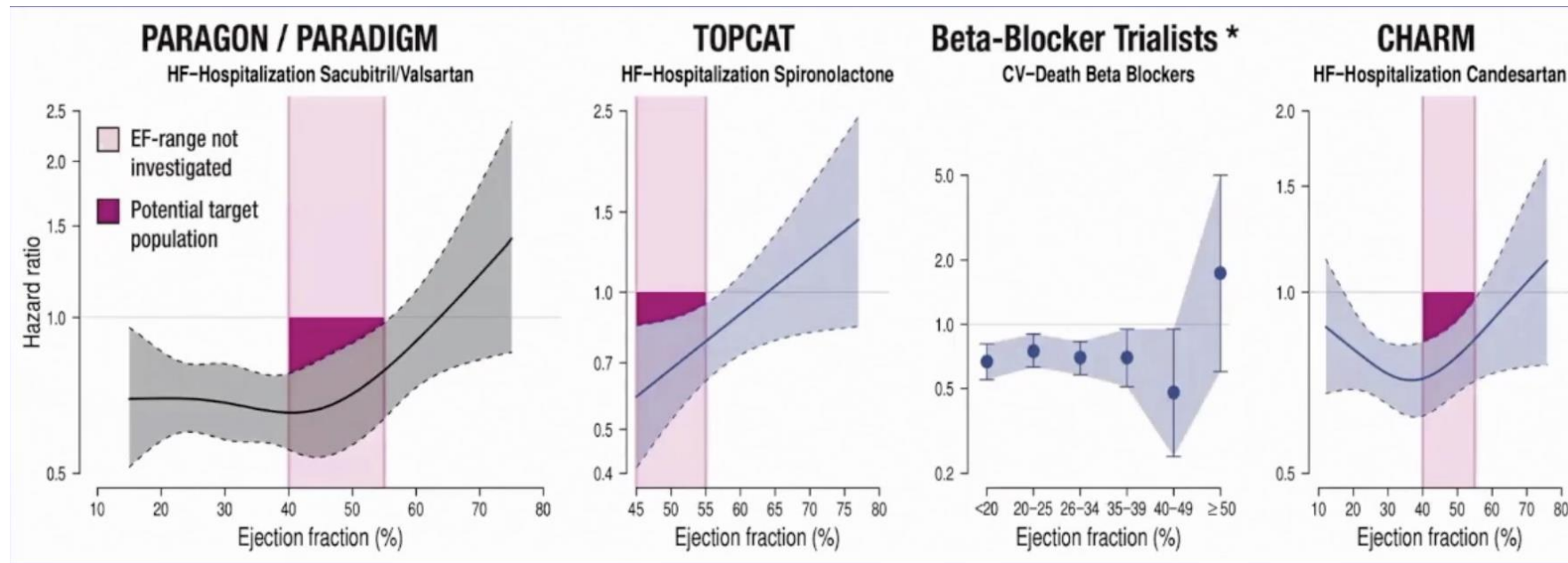
E: Edema despite escalating diuretic agents

L: Low blood pressure, high heart rate

P: Prognostic medication - progressive intolerance or down-titration of GDMT

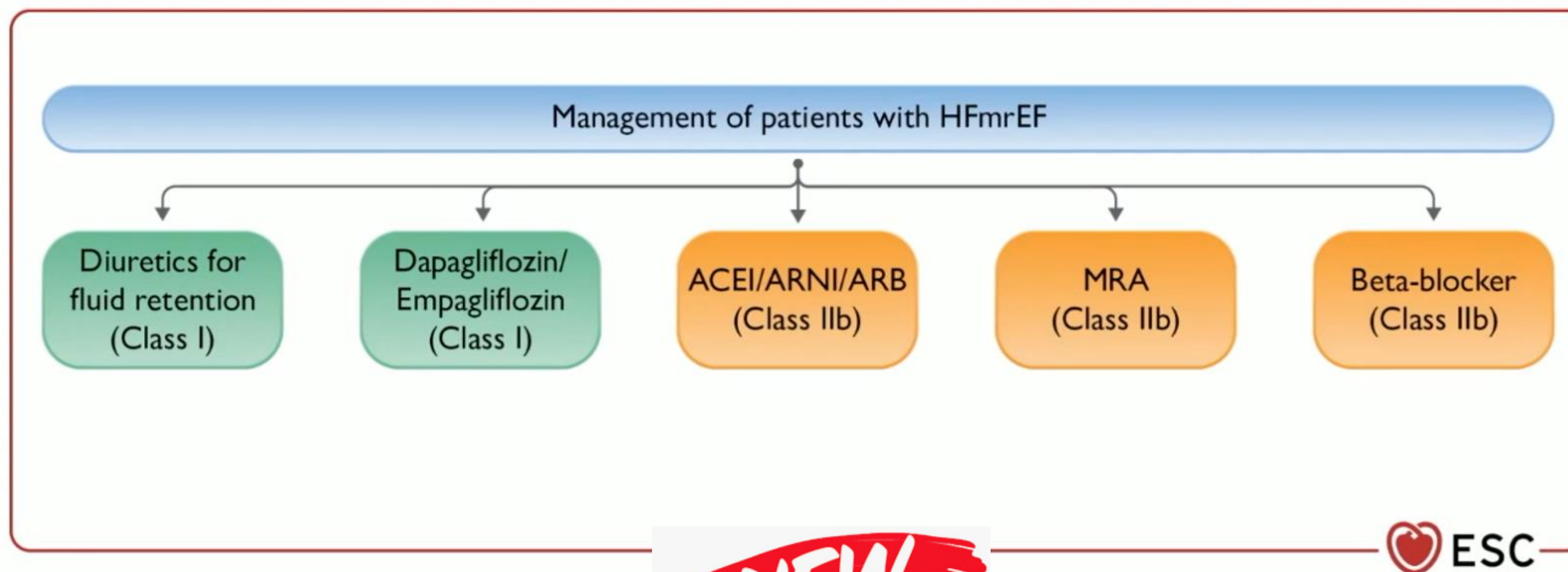
Klinikai helyzet	Részletes útmutató
1. Új keletű szívelégtelenség esetén (BKEF-től függetlenül)	<p>Cél az etiológia megállapítása</p> <p>Az ajánlásokon alapuló gyógyszeres kezelés beállítása</p> <p>Gondozásba vétel</p> <p>Fejlett képalkotó eljárások szükségessége</p> <p>Szívizom-biopszia vagy genetikai vizsgálat elbírálása</p>
2. „High risk” krónikus szívelégtelenség (az itt felsorolt 1 vagy több rizikófaktor kialakulása vagy tartós jelenléte esetén)	<p>Krónikus intravénás inotróp igény</p> <p>NYHA III–IV. funkcionális stádiummal járó pangás vagy kifejezett kimerültség</p> <p>< 90 Hgmm alatti szisztolés vérnyomás vagy tünetes hipotónia</p> <p>Kreatinin $160 \mu\text{mol/l}$ vagy urea 15 mmol/l felett</p> <p>Pitvarfibrilláció, kamrai ritmuszavarok kialakulása vagy ismétlődő ICD-sokkok esetén</p> <p>12 hónap alatt 2 vagy több sürgősségi vagy kórházi megjelenés romló szívelégtelenség miatt</p> <p>Az optimális dózisu béta-blokkolót, ARNI/ACEI/ARB-t vagy MRA-t nem tolerálja</p> <p>Klinikai hanyatlás: romló ödémahajlam vagy romló tünetek, emelkedő biomarkerek (NT-proBNP, BNP, egyéb), csökkenő terhelési kapacitás, dekompenzált hemodinamikai státusz, progresszív remodeling a képalkotó során</p> <p>Validált rizikómodellel nagy mortalitási rizikó (pl. Seattle Heart Failure Model)</p>
3. 3 hó GDMT ellenére tartósan $< 35\%$ alatti LVEF	<p>ICD vagy CRT elbírálása javasolt, ha az nem kontraindikált, vagy a korábban meghatározott kezelési céllal nem ütközik</p>
4. Ha másodvélemény szükséges az etiológia miatt, például:	<p>Koronáriaizskémia esetén revaszkularizáció hasznának elbírálására</p> <p>Billentyűbetegség esetén rekonstrukciótól várható haszon</p> <p>Myocarditis gyanúja</p> <p>Bizonyos cardiomyopathiák jelenléte vagy gyanúja (HCM, ARVD, restriktív CMP, szívscarcoidosis, amyloidosis, aorta stenosis)</p>
5. Éves ellenőrzés előrehaladott szívelégtelenségben	<p>A beteg és ellátói egyeztetnek a jelenlegi és további kezelési lehetőségekről, a prognózisról, a beteg preferenciáiról, későbbi ellátásáról</p>
6. Klinikai tanulmányba (study) való bevonás szóba jön	

HFmrEF – klinikai vizsgálatok



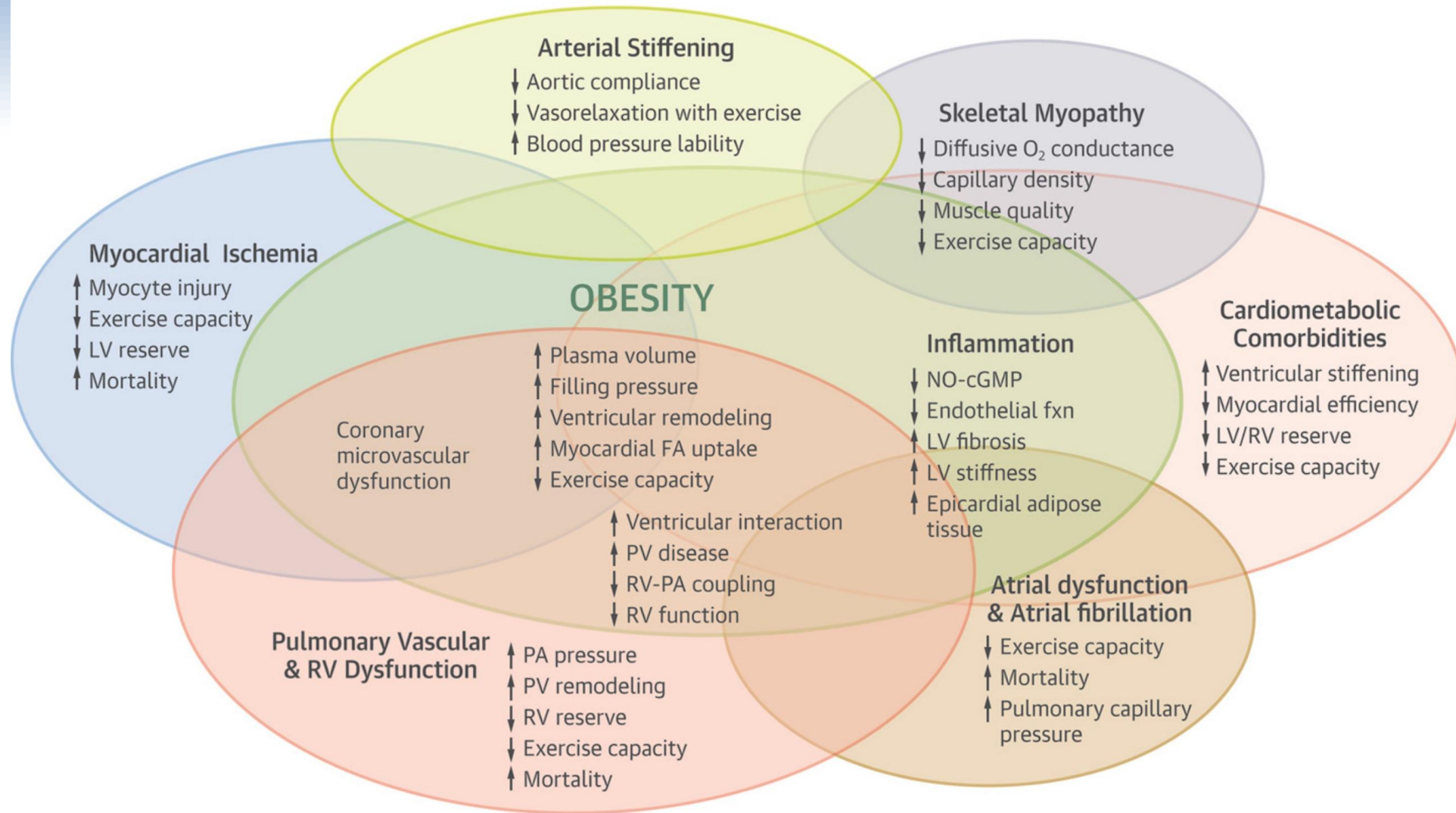
Recommendation for the treatment of patients with symptomatic heart failure with mildly reduced ejection fraction ESC

Recommendations	Class	Level
An SGLT2 inhibitor (dapagliflozin or empagliflozin) is recommended in patients with HFmrEF to reduce the risk of HF hospitalization or CV death.	I	A



NEW

PATHOPHYSIOLOGIC PHENOTYPES IN HFpEF

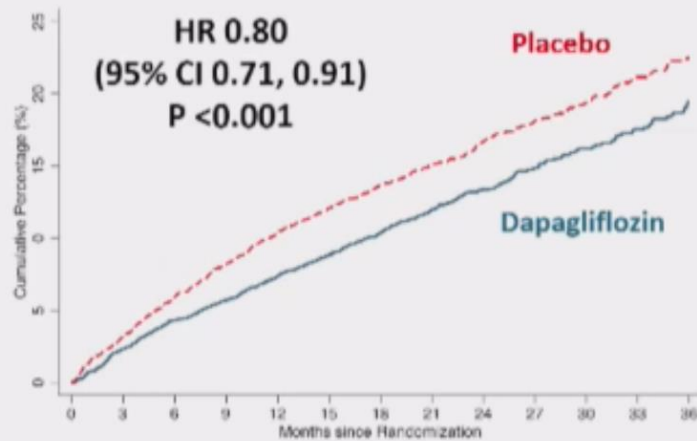


SGLT2 inhibitors in patients with HFmrEF and HFpEF

Patients with and without type 2 diabetes

DELIVER

CV Death/ HF hospitalization



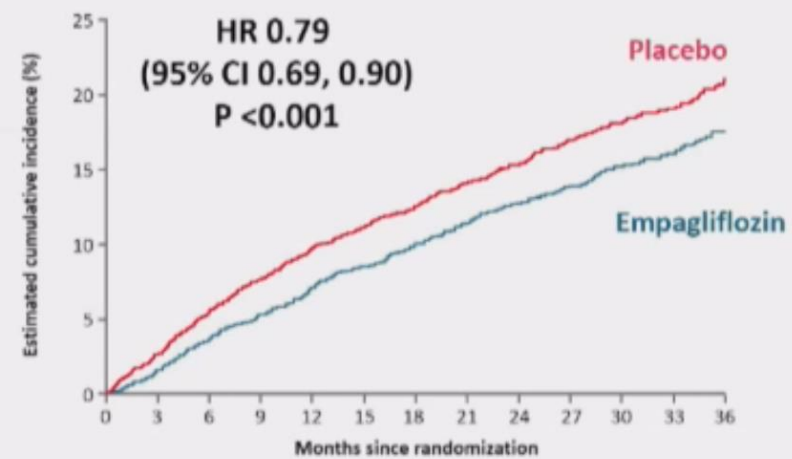
Patients at risk

Dapagliflozin	3131	3045	2993	2910	2826	2738	2627	2514	2398	1628	1197	814	398
Placebo	3132	3018	2918	2825	2738	2638	2548	2411	2363	1670	1181	789	389

Solomon, McMurray, Claggett et al
N Engl J Med. 2022 Aug 27. doi: 10.1056/NEJMoa2206286

EMPEROR-Preserved

CV Death/ HF hospitalization

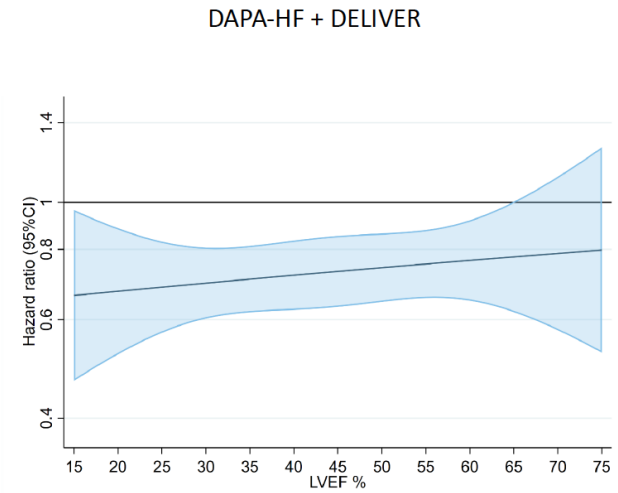
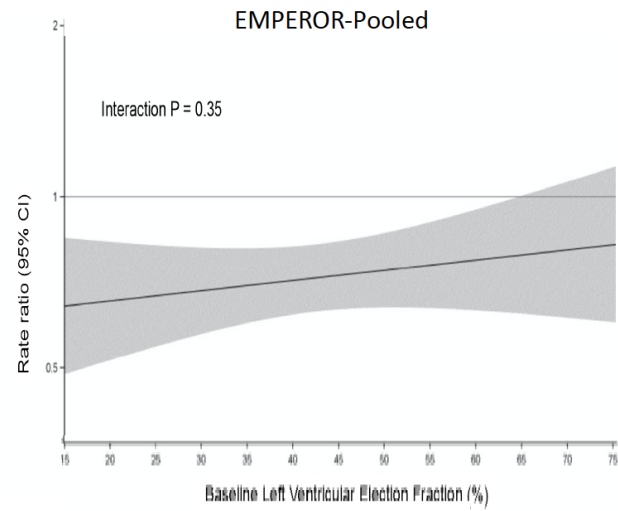


Patients at risk

Placebo	2991	2888	2786	2706	2627	2424	2066	1821	1534	1278	961	681	400
Empagliflozin	2997	2928	2843	2780	2708	2491	2134	1858	1578	1332	1005	709	402

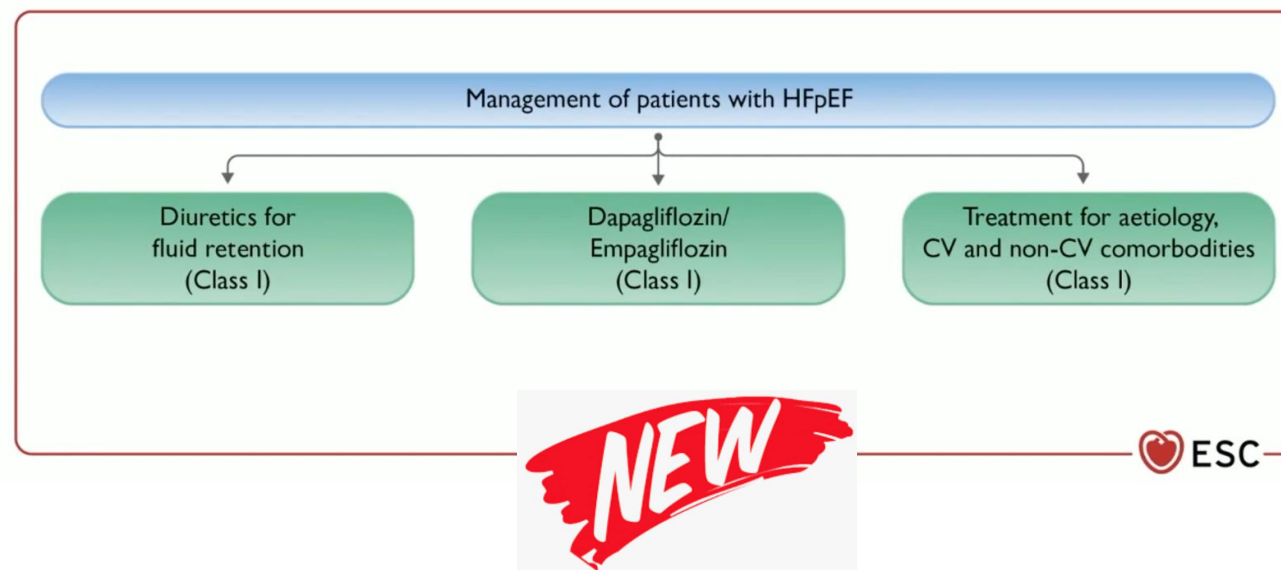
Anker, Butler, Filippatos et al
N Engl J Med. 2021; 385: 1451-1461.

SGLT2is effect on First hospitalizations for HF

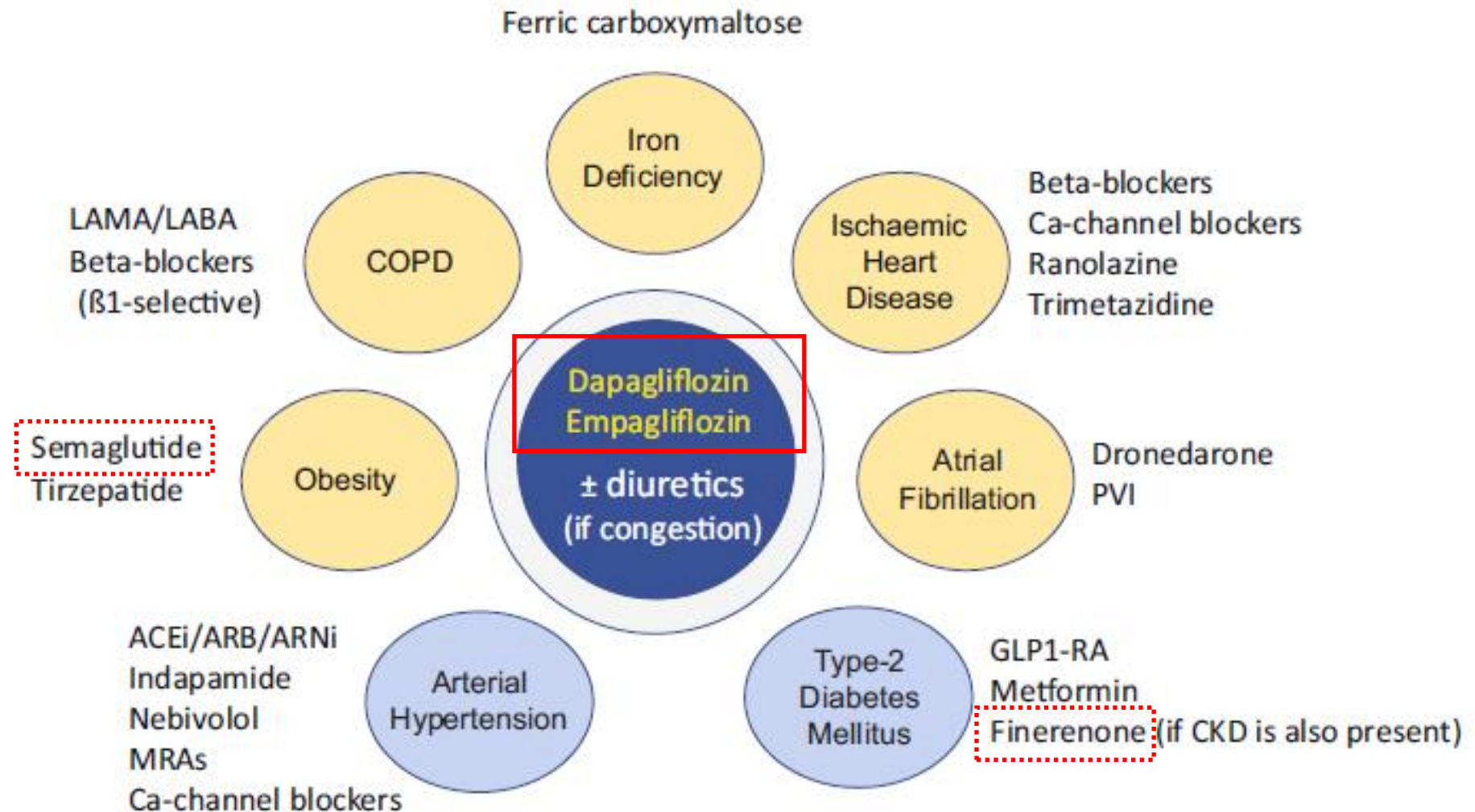


Recommendation for the treatment of patients with symptomatic heart failure with preserved ejection fraction

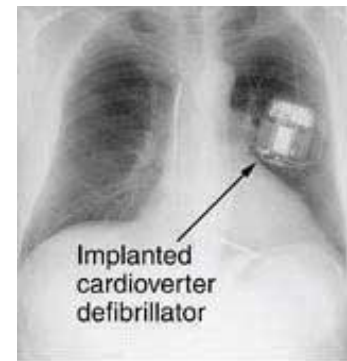
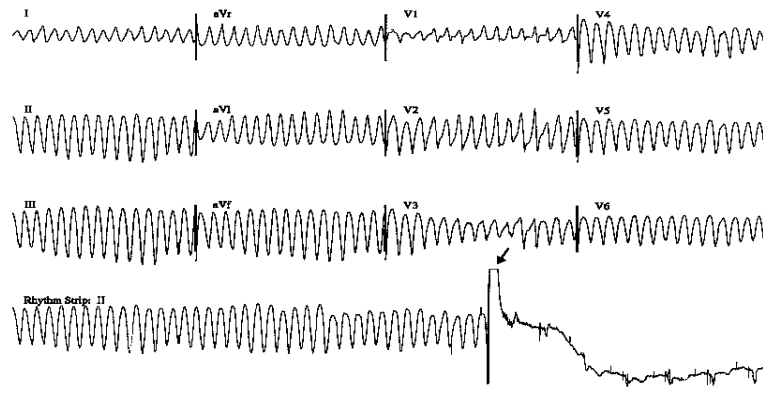
Recommendations	Class	Level
An SGLT2 inhibitor (dapagliflozin or empagliflozin) is recommended in patients with HFpEF to reduce the risk of HF hospitalization or CV death.	I	A



Célzott HFpEF-terápia



A BEÜLTETHETŐ KARDIOVERTER DEFIBRILLÁTOR ALKALMAZÁSÁRA VONATKOZÓ AJÁNLÁSOK SZÍVELÉGTELENSÉGBEN



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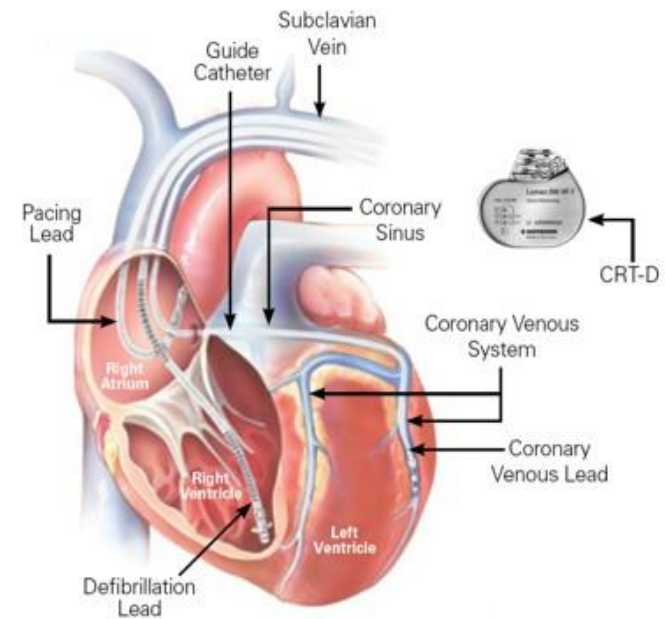
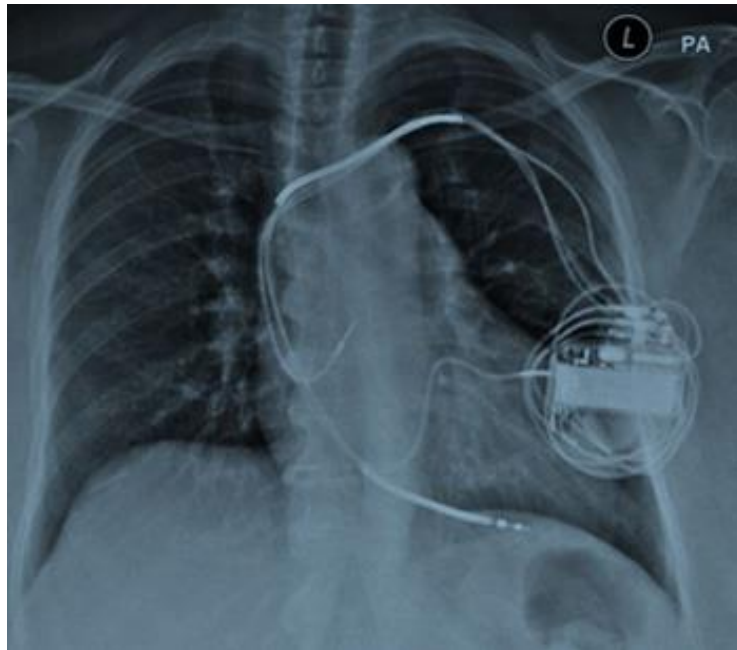
Beültethető (implantálható) cardioverter defibrillátor (ICD)

Recommendations	Class ^a	Level ^b
Secondary prevention		
An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients who have recovered from a ventricular arrhythmia causing haemodynamic instability, and who are expected to survive for <u>>1 year with good functional status</u> , in the absence of reversible causes or unless the ventricular arrhythmia has occurred <48 h after a MI. ^{162–164}	I	A
Primary prevention		
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 <u>≥3 months of OMT</u> , 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



Recommendations	Class ^a	Level ^b
Primary prevention		
Patients should be carefully evaluated by an experienced cardiologist before generator replacement, because management goals, the patient's needs and clinical status may have changed. ^{168–172}	IIa	B
A wearable ICD may be considered for patients with HF who are at risk of sudden cardiac death for a limited period or as a bridge to an implanted device. ^{173–176}	IIb	B
ICD implantation is not recommended within 40 days of a MI as implantation at this time does not improve prognosis. ^{177,178}	III	A
ICD therapy is not recommended in patients in NYHA class IV with severe symptoms refractory to pharmacological therapy unless they are candidates for CRT, a VAD, or cardiac transplantation. ^{179–183}	III	C

A KARDIÁLIS RESZINKRONIZÁCIÓS KEZELÉSRE VONATKOZÓ AJÁNLÁSOK SZÍVELÉGTELENSÉGBEN



Kardiális reszinkronizációs kezelés (CRT)

Recommendations	Class ^a	Level ^b
CRT is recommended for symptomatic patients with HF in SR with a QRS duration ≥ 150 ms and LBBB QRS morphology and with LVEF $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality. ^{205–215}	I	A
CRT rather than RV pacing is recommended for patients with HFrEF regardless of NYHA class or QRS width who have an indication for ventricular pacing for high degree AV block in order to reduce morbidity. This includes patients with AF. ^{216–219}	I	A
CRT should be considered for symptomatic patients with HF in SR with a QRS duration ≥ 150 ms and non-LBBB QRS morphology and with LVEF $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality. ^{205–215}	IIa	B



Recommendations	Class ^a	Level ^b
CRT should be considered for symptomatic patients with HF in SR with a QRS duration of 130–149 ms and LBBB QRS morphology and with LVEF $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality. ^{211,220}	IIa	B
Patients with an LVEF $\leq 35\%$ who have received a conventional pacemaker or an ICD and subsequently develop worsening HF despite OMT and who have a significant proportion of RV pacing should be considered for 'upgrade' to CRT. ²²¹ CRT may be considered for symptomatic patients with HF in SR with a QRS duration of 130–149 ms and non-LBBB QRS morphology and with LVEF $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality. ^{208,213}	IIa	B
CRT may be considered for symptomatic patients with HF in SR with a QRS duration of 130–149 ms and non-LBBB QRS morphology and with LVEF $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality. ^{208,213}	IIb	B
CRT is not recommended in patients with a QRS duration < 130 ms who do not have an indication for pacing due to high degree AV block. ^{222–224}	III	A



Conduction System Pacing

BUDAPEST CRT Upgrade trial #ESCCongress

CRT upgrade in HF with RV pacing

Conclusion



Upgrade to cardiac resynchronisation therapy with a defibrillator (CRT-D) reduces morbidity and mortality and improves left ventricular reverse remodelling in select patients with heart failure and reduced ejection fraction (HFrEF) and intermittent or permanent right ventricular (RV) pacing.

Impact on clinical practice



HFrEF patients with a pacemaker or ICD should be strictly followed in clinical practice and in those with intermittent or permanent RV pacing, a CRT upgrade should be performed immediately without deferring the procedure to a later date (e.g. battery replacement).

Study objectives



BUDAPEST CRT Upgrade was the first trial to compare the efficacy and safety of a CRT upgrade, compared to ICD alone, in HFrEF patients with a pacemaker or ICD and intermittent or permanent RV pacing.

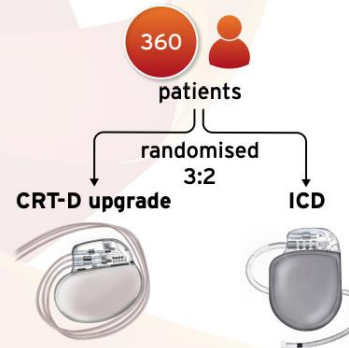
Study population

HFrEF patients

- with ejection fraction $\leq 35\%$
- had received a pacemaker or ICD >6 months previously
- had HF symptoms
- had a wide paced QRS complex
- had a high burden of RV pacing
- treated with guideline-directed medical therapy

Patients were excluded if they were eligible for CRT according to current guidelines

Who and what?



Where?



7 countries



17 sites



Median follow-up

12.4 months

Primary endpoint

Composite of HF hospitalisation, all-cause mortality, or $<15\%$ reduction of left ventricular end-systolic volume



Rate%

32.4%



Adjusted odds ratio 0.11
95% CI 0.06-0.19; $p < 0.001$

Secondary endpoint

Composite of HF hospitalisation and all-cause mortality reduced with



Adjusted hazard ratio 0.28
95% CI 0.17-0.46; $p < 0.001$

NEW



Nem gyógyszeres kezelési lehetőségek

Ultrafiltratio - UNLOAD study Ila B

Intraaortikus ballon-pumpa

Őssejt beültetés

Vagus stimulálás

Sebészi kezelés

Revascularisatio (Viabilitás) STICH

Billentyű műtét, TAVI, Mitra clip

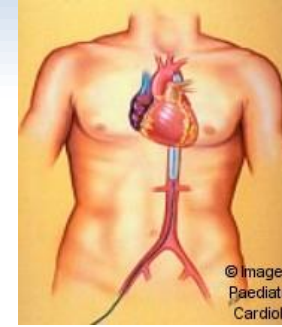
Szívtranszplantáció I C

85-90%-os egy éves túlélés

60-75%-os öt éves túlélés

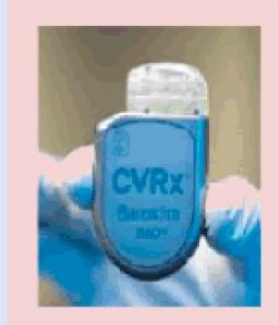
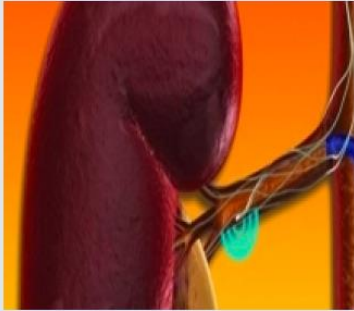
Assist device – LVAD, RVAD, BiVAD

Tréningprogram, Multidiszciplináris kezelés, Palliatív kezelés

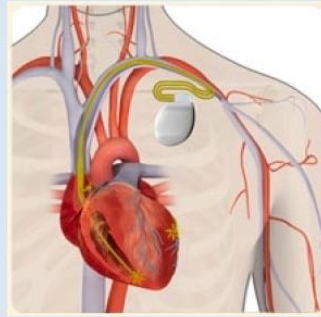


Devices and HFPEF Therapy Options

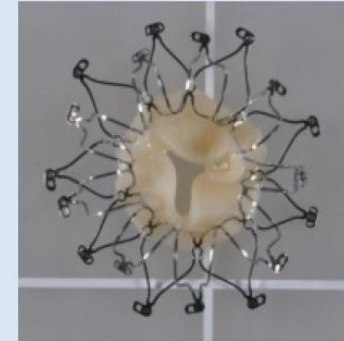
Autonomic modulation



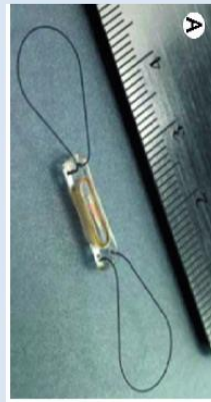
Defi/ CRT /CCM



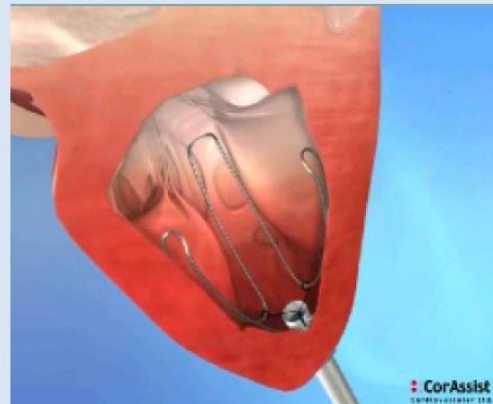
Shunts



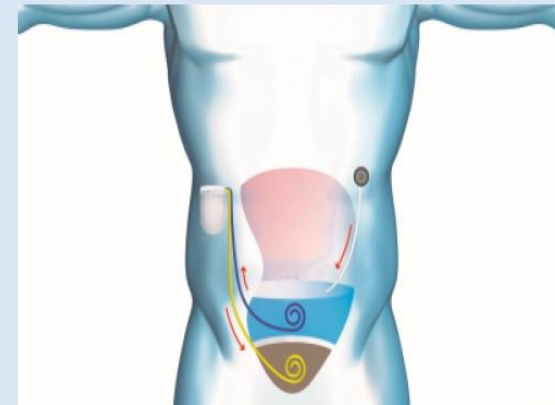
Congestion monitoring

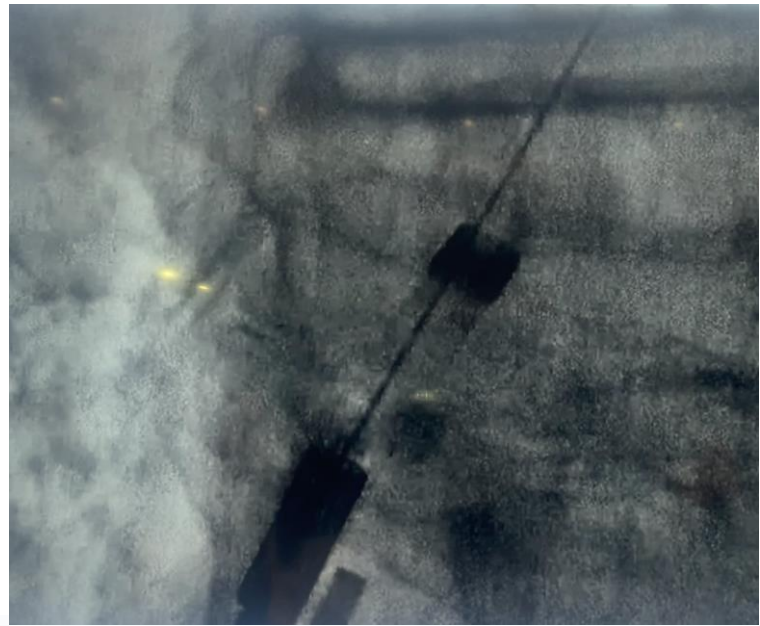
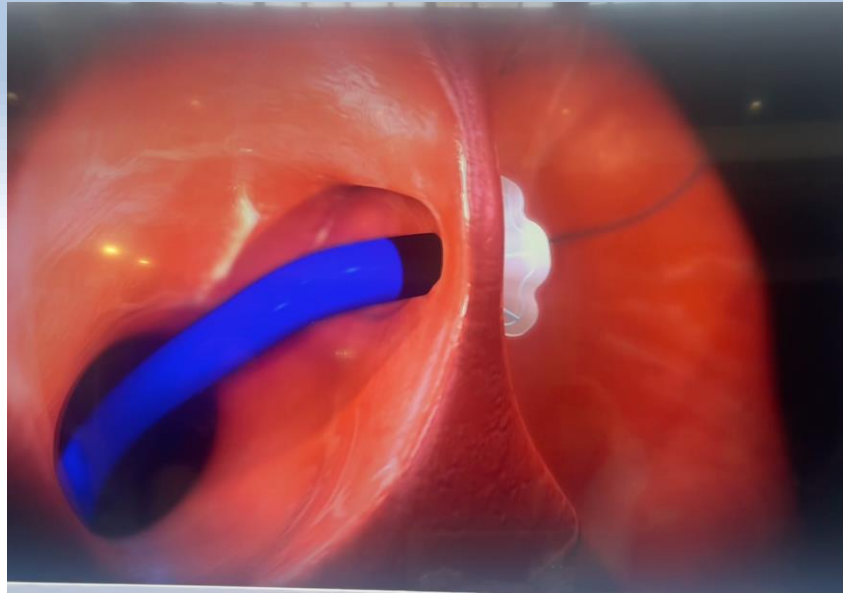


Mechanical „relaxation“

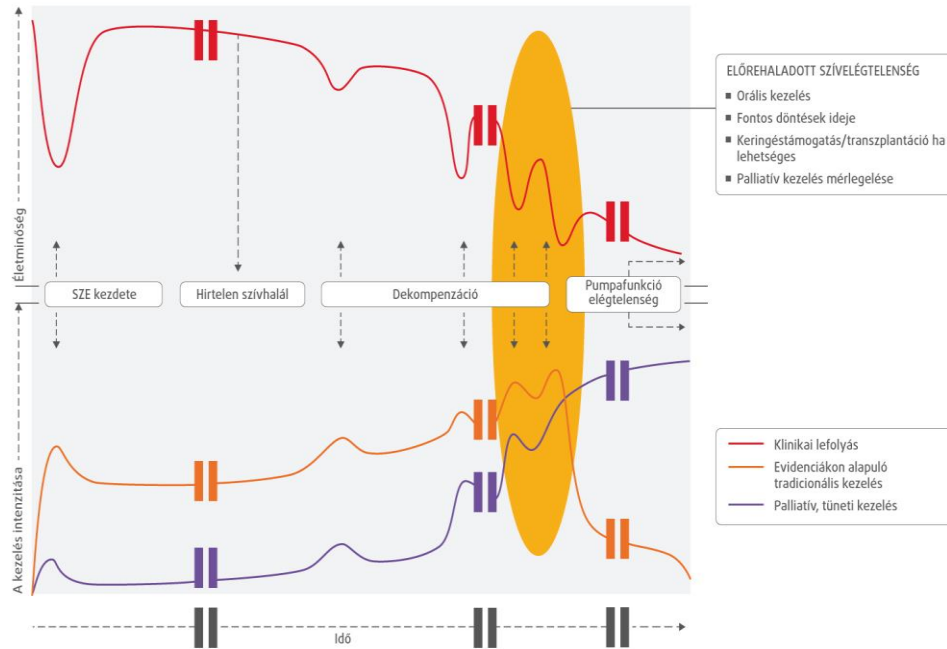


Overload management

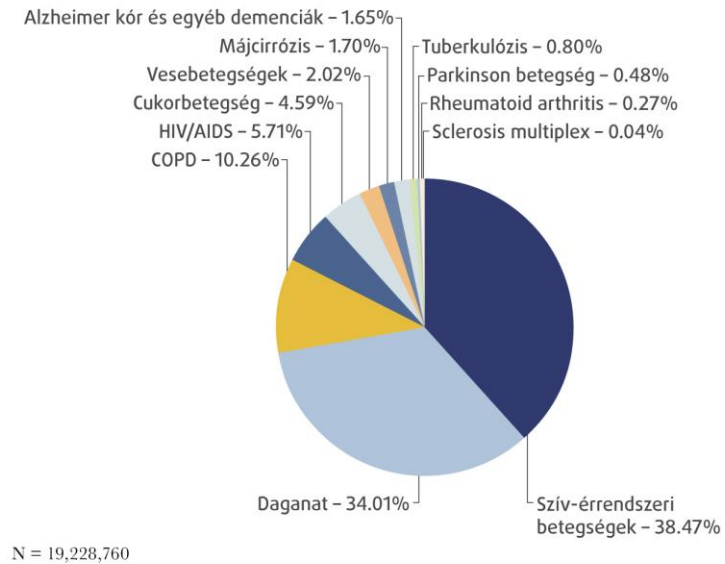




Palliatív kezelés



A szívelégtelenség kórlefolyása
(Circulation. 2012; 125(15): 1928-52.)



**Az életvégi palliatív ellátás szükségessége
felnőtt betegekben, betegségek szerint.**

(Global Atlas of Palliative Care at the End of Life,
World Health Organization)

Köszönöm a figyelmet!



AZ ŐSZ MOSOLYA