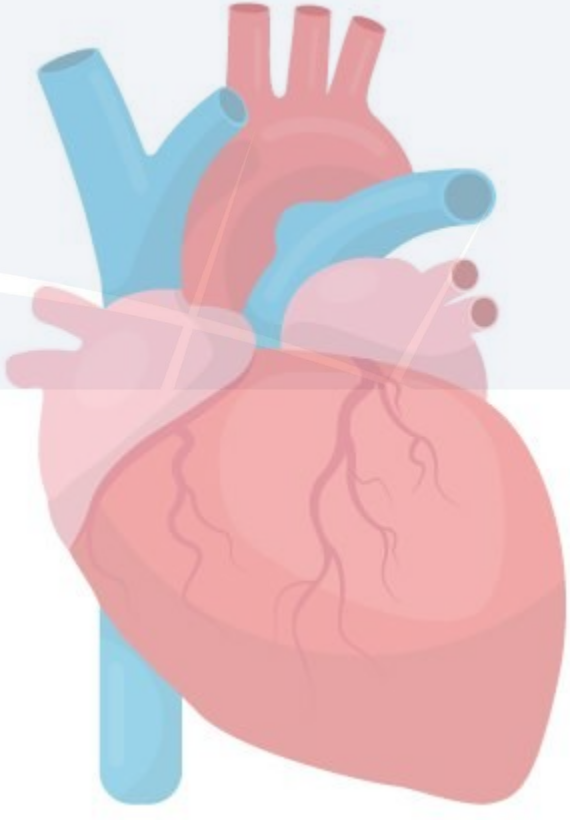
I nuovi farmaci nello scompenso cardiaco



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XIII congresso nazionale
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GENOVA 30 MAG - 1 GIU 2024

Definizione

Per scompenso cardiaco si intende una sindrome caratterizzata da una costellazione di segni e sintomi provocati da alterazioni strutturali o funzionali dell'organo cardiaco.

Tali anomalie determinano delle elevate pressioni di riempimento intracardiaco e/o un inadeguato output sistolico, a riposo o durante le attività fisiche.

Classificazione

L’insufficienza cardiaca si classifica sulla base del valore di frazione di eiezione riscontrata in differenti sottotipi con importanti risvolti terapeutici

- Insufficienza cardiaca a frazione di eiezione ridotta, FE≤40% (HFrEF)
- Insufficienza cardiaca a frazione di eiezione lievemente ridotta, FE 41-49% (HFmrEF)
- Insufficienza cardiaca a frazione di eiezione preservata, FE>50% (HFpEF)

Insufficienza cardiaca con FE «migliorata, da ≤ 40% a >40% (HFimpEF)

Insufficienza cardiaca a frazione di eiezione ridotta HFrEF

La terapia farmacologica trova imprescindibile fondamento su quattro classi farmacologiche principali:

- Beta bloccanti
- Inibitori dei recettori mineralcorticoidi
- Modulatori del sistema renina/angiotensina/aldosterone
- Inibitori del co-trasportatore sodio glucosio, SGLT2

Trovano indicazioni peculiari l'eventuale impianto di ICD e/o RCT

Insufficienza cardiaca a frazione di eiezione lievemente ridotta, HFmrEF

La terapia farmacologica si basa sull'efficacia dimostrata per i pazienti con FE inferiore a 40% e su analisi di sottogruppi dei trials per i pazienti con FE conservata.
Da ciò deriva che le attuali evidenze su questi farmaci sono solo indirette con conseguenti limitazioni

Recommendations	Class[a]	Level[b]
Diuretics are recommended in patients with congestion and HFmrEF in order to alleviate symptoms and signs.[137]	I	C
An ACE-I may be considered for patients with HFmrEF to reduce the risk of HF hospitalization and death.[11]	IIb	C
An ARB may be considered for patients with HFmrEF to reduce the risk of HF hospitalization and death.[245]	IIb	C
A beta-blocker may be considered for patients with HFmrEF to reduce the risk of HF hospitalization and death.[12,119]	IIb	C
An MRA may be considered for patients with HFmrEF to reduce the risk of HF hospitalization and death.[246]	IIb	C
Sacubitril/valsartan may be considered for patients with HFmrEF to reduce the risk of HF hospitalization and death.[13,247]	IIb	C

ACE-I = angiotensin-converting enzyme inhibitor; ARB = angiotensin-receptor blocker; HF = heart failure; HFmrEF = heart failure with mildly reduced ejection fraction; MRA = mineralocorticoid receptor antagonist; NYHA = New York Heart Association.
[a]Class of recommendation.
[b]Level of evidence.

ESC guidelines 2021

EUROPEAN SOCIETY OF CARDIOLOGY®

European Journal of Heart Failure (2016) **18**, 402–410
doi:10.1002/ejhf.471

RESEARCH ARTICLE

The real-world evidence of heart failure: findings from 41 413 patients of the ARNO database

Aldo P. Maggioni[1]*, Francesco Orso[1,2], Silvia Calabria[3], Elisa Rossi[4], Elisa Cinconze[4], Samuele Baldasseroni[5], and Nello Martini[6], on behalf of the ARNO Observatory†

Table 1 Demographics, clinical characteristics, co-morbid conditions, and cardiovascular hospitalizations in the preceding year

Characteristics	All patients ($n = 41\,413$)	Primary diagnosis ($n = 27\,126$)
Age (years), mean ± SD	78 ± 11	78 ± 11
Female, mean ± SD	80 ± 10	81 ± 10
Male, mean ± SD	75 ± 11	76 ± 11
Diabetes, *n* (%)	12 705 (30.7)	8525 (31.4)
COPD, *n* (%)	12 615 (30.5)	8340 (30.7)
Depression, *n* (%)	8687 (21.0)	5550 (20.5)
Cancer, *n* (%)	1895 (4.6)	1167 (4.3)
CKD, *n* (%)	1761 (4.3)	1224 (4.5)
Hospitalizations for HF, *n* (%)	689 (1.7)	605 (2.2)
Hospitalization for ACS, *n* (%)	1658 (4.0)	1060 (3.9)
Hospitalization for stroke/TIA, *n* (%)	1165 (2.8)	719 (2.7)
Hospitalization for arrhythmias, *n* (%)	1119 (2.7)	841 (3.1)
of which atrial fibrillation, n (%)	*782 (1.9)*	*600 (2.2)*

ACS, acute coronary syndrome; CKD, chronic kidney disease; HF, heart failure; TIA, transient ischaemic attack.

Table 2 Pharmacological treatments in patients with heart failure during the 1-year follow-up

Treatments	All patients ($n = 41\,413$)	Primary diagnosis ($n = 27\,126$)
Diuretics, *n* (%)	34 855 (84.2)	23 912 (88.2)
ARBs/ACE inhibitors, *n* (%)	27 269 (65.8)	18 182 (67.0)
Beta-blockers, *n* (%)	21 650 (52.3)	14 757 (54.4)
MRAs, *n* (%)	17 432 (42.1)	12 788 (47.1)
Digoxin, *n* (%)	11 101 (26.8)	8290 (30.6)
Ivabradine, *n* (%)	636 (1.5)	415 (1.5)

MRAs, mineralocorticoid receptor antagonists.

The NEW ENGLAND JOURNAL of MEDICINE

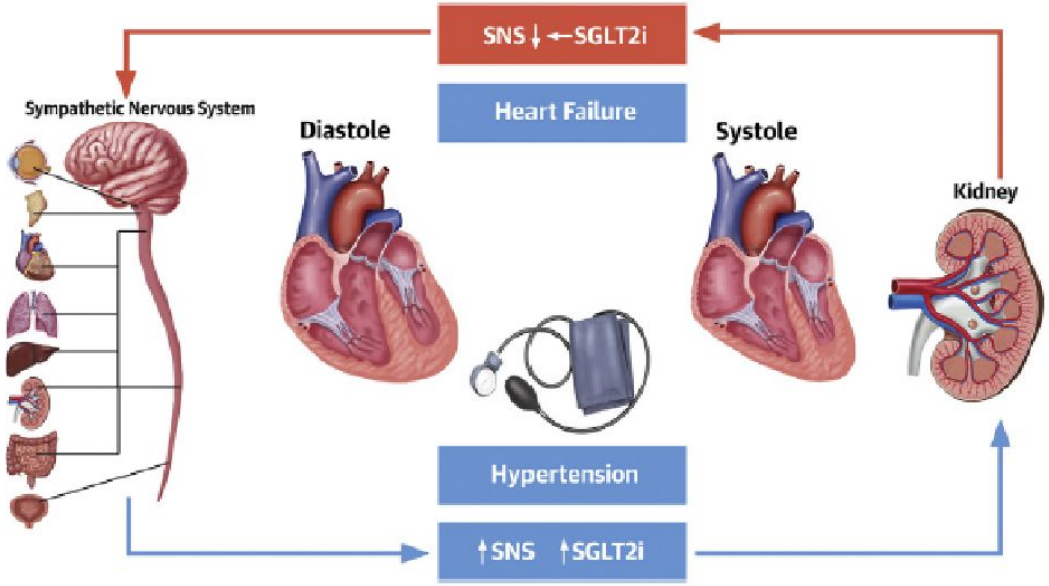
ORIGINAL ARTICLE

Empagliflozin, Cardiovascular Outcomes, and Mortality in Type 2 Diabetes

Bernard Zinman, M.D., Christoph Wanner, M.D., John M. Lachin, Sc.D., David Fitchett, M.D., Erich Bluhmki, Ph.D., Stefan Hantel, Ph.D., Michaela Mattheus, Dipl. Biomath., Theresa Devins, Dr.P.H., Odd Erik Johansen, M.D., Ph.D., Hans J. Woerle, M.D., Uli C. Broedl, M.D., and Silvio E. Inzucchi, M.D., for the EMPA-REG OUTCOME Investigators

2015

FIGURE 1 Inter-Relationships Between SGLT2i and the Sympathetic Nervous System and Illustration of the Positive Role of SGLT2i in Hypertension and Heart Failure



Adapted from Scheen (39). SGLT2i = sodium-glucose cotransporter 2 inhibitors; SNS = sympathetic nervous system.

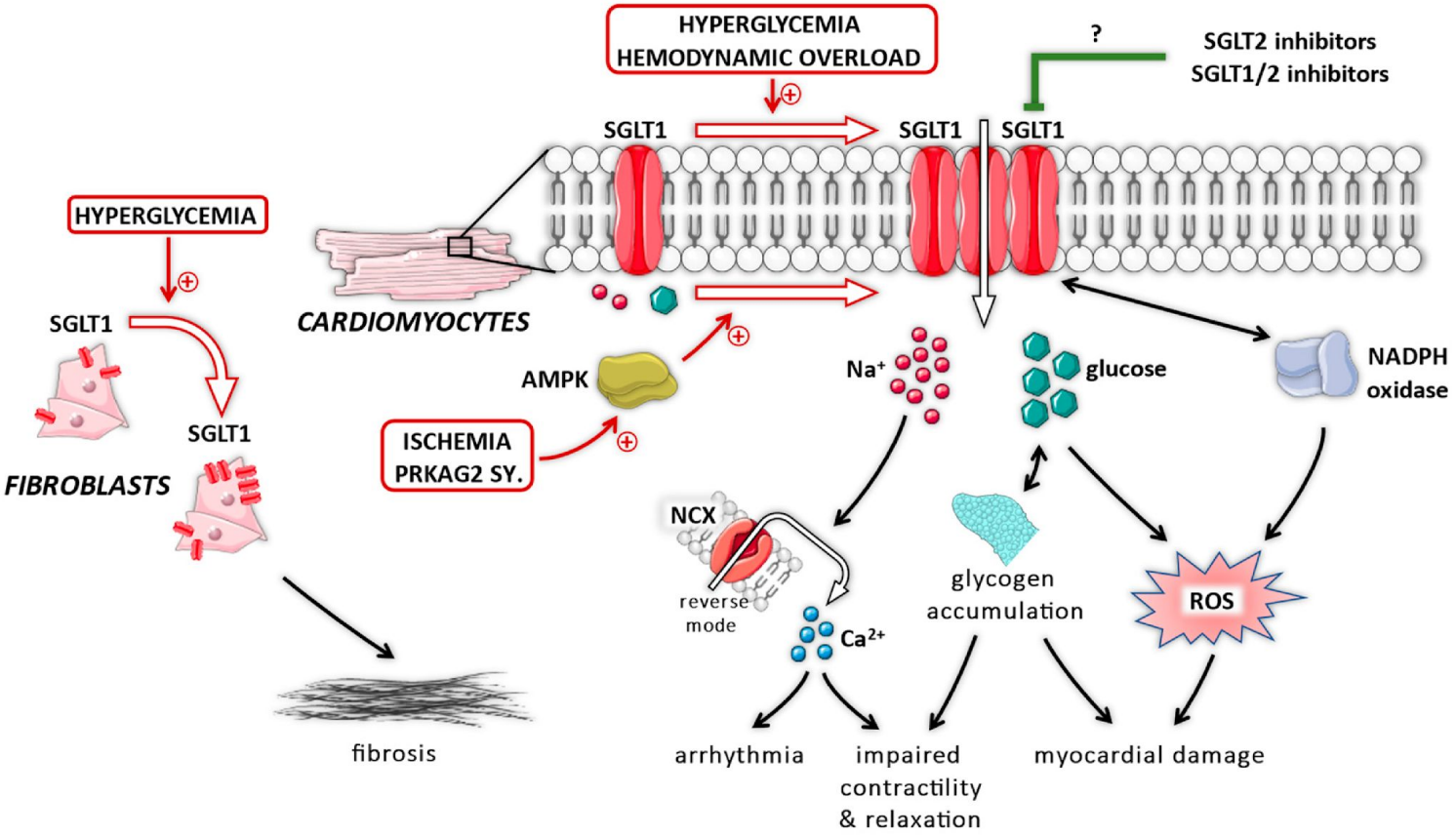
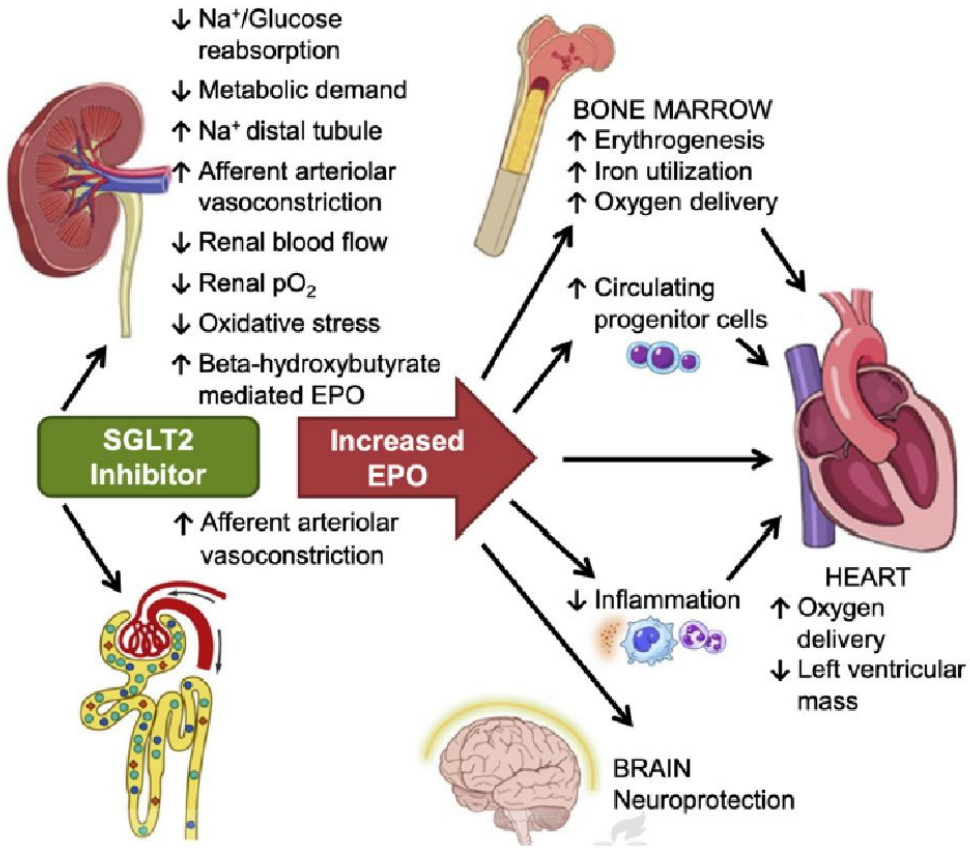

HYPERGLYCEMIA
HEMODYNAMIC OVERLOAD
?
SGLT2 inhibitors
SGLT1/2 inhibitors
SGLT1
SGLT1
SGLT1
HYPERGLYCEMIA
SGLT1
SGLT1
FIBROBLASTS
CARDIOMYOCYTES
AMPK
ISCHEMIA
PRKAG2 SY.
Na+
glucose
NADPH
oxidase
NCX
reverse
mode
Ca2+
glycogen
accumulation
ROS
fibrosis
arrhythmia
impaired
contractility
& relaxation
myocardial damage

FIGURE 3 Multiple Sites for the Beneficial Effects of SGLT2 Inhibition



ESC European Society of Cardiology

European Heart Journal (2022) **43**, 1029–1030
https://doi.org/10.1093/eurheartj/ehab765

CARDIOPULSE

Braunwald's Corner

SGLT2 inhibitors: the statins of the 21st century

Eugene Braunwald [1,2]*

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A relatively small number of drugs have been responsible for major advances in medical practice. The discovery, development, and elucidation of the mechanisms of action of aspirin, penicillin, and statins are remarkable success stories, each with some surprises and each crowned by a Nobel Prize. The sodium glucose co-transporter inhibitors have been proven effective in the treatment of type 2 diabetes mellitus, various forms of heart failure, and kidney failure and represent *the, or one of the*, major pharmacological advances in cardiovascular medicine in the 21st century.

1. SGLT2 inhibitors are not only glucosuric but also reduce the development and progression of heart failure and prolong life in patients with T2DM and reduced left ventricular ejection fraction.

2. *SGLT2 inhibitors improve outcomes in patients with HFrEF irrespective of the presence or absence of T2DM*, thereby greatly expanding the potential target population for these drugs.

3. *SGLT2 inhibitors appear to be beneficial in patients with chronic heart failure over a wide range of ejection fractions*, again greatly expanding the target population even further.

4. *SGLT2 inhibitors slow the development of end-stage kidney disease in patients with chronic kidney disease*. The benefit of SGLT2i in patients without T2DM but with a variety of chronic kidney diseases is under investigation.

European Heart Journal (2022) **43**, 1029–1030
https://doi.org/10.1093/eurheartj/ehab765

Recommendation Table 1 — Recommendation for the treatment of patients with symptomatic heart failure with mildly reduced ejection fraction

Recommendation	Class[a]	Level[b]
An SGLT2 inhibitor (dapagliflozin or empagliflozin) is recommended in patients with HFmrEF to reduce the risk of HF hospitalization or CV death.[c] [6,8]	I	A

CV, cardiovascular; HF, heart failure; HFmrEF, heart failure with mildly reduced ejection fraction; SGLT2, sodium–glucose co-transporter 2.
[a]Class of recommendation.
[b]Level of evidence.
[c]This recommendation is based on the reduction of the primary composite endpoint used in the EMPEROR-Preserved and DELIVER trials and in a meta-analysis. However, it should be noted that there was a significant reduction only in HF hospitalizations and no reduction in CV death.

Recommendation Table 2 — Recommendation for the treatment of patients with symptomatic heart failure with preserved ejection fraction

Recommendation	Class[a]	Level[b]
An SGLT2 inhibitor (dapagliflozin or empagliflozin) is recommended in patients with HFpEF to reduce the risk of HF hospitalization or CV death.[c] [6,8]	I	A

CV, cardiovascular; HF, heart failure; HFpEF, heart failure with preserved ejection fraction; SGLT2, sodium–glucose co-transporter 2.
[a]Class of recommendation.
[b]Level of evidence.
[c]This recommendation is based on the reduction of the primary composite endpoint used in the EMPEROR-Preserved and DELIVER trials and in a meta-analysis. However, it should be noted that there was a significant reduction only in HF hospitalizations and no reduction in CV death.

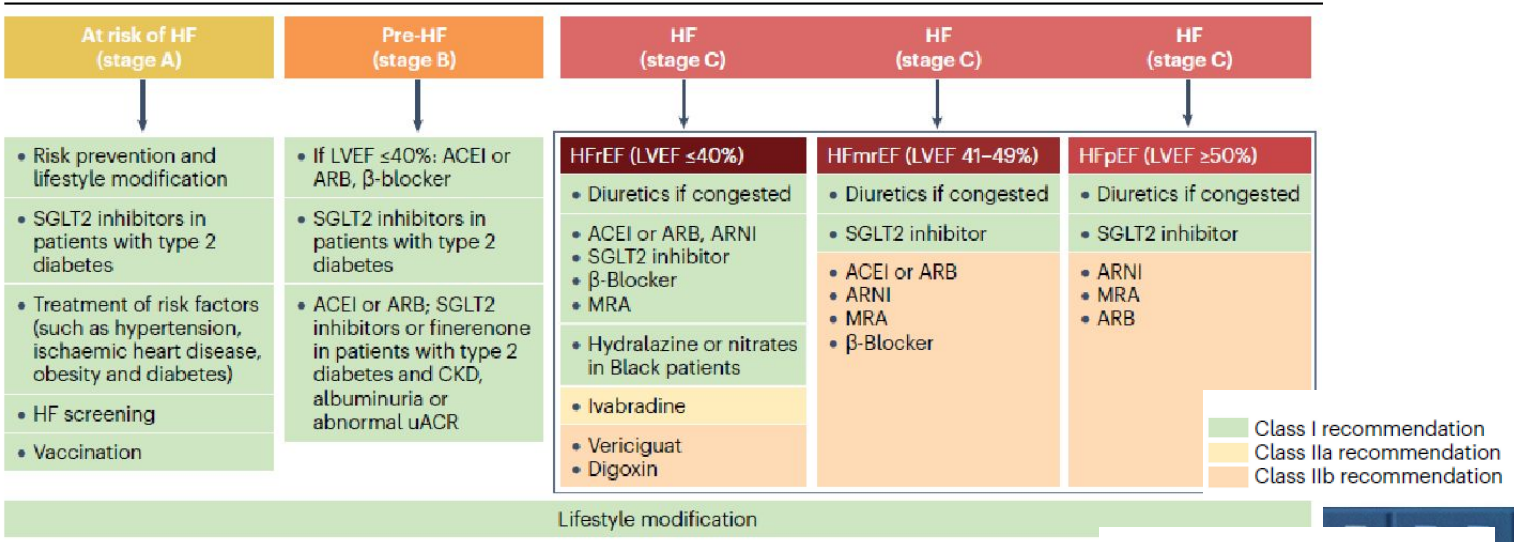
nature reviews cardiology

https://doi.org/10.1038/s41569-024-00997-0

Review article

Check for updates

Contemporary pharmacological treatment and management of heart failure



Published online: 26 March 2024

Acetazolamide

Farmaco inibitore dell'enzima anidrasi carbonica presente nel tubulo contorto prossimale renale, responsabile del riassorbimento di bicarbonato, sodio e cloro. E' caratterizzato da un modesto effetto diuretico, poiché gran parte dei liquidi vengono riassorbiti distalmente a livello dell'ansa di Henle.

Il suo utilizzo è indicato nel trattamento del mal di montagna acuto, ipertensione endocranica idiopatica, glaucoma acuto ad angolo chiuso

Dose utilizzata: 250-500mg, 1 o 2 volte al giorno in base all'indicazione

The NEW ENGLAND JOURNAL of MEDICINE

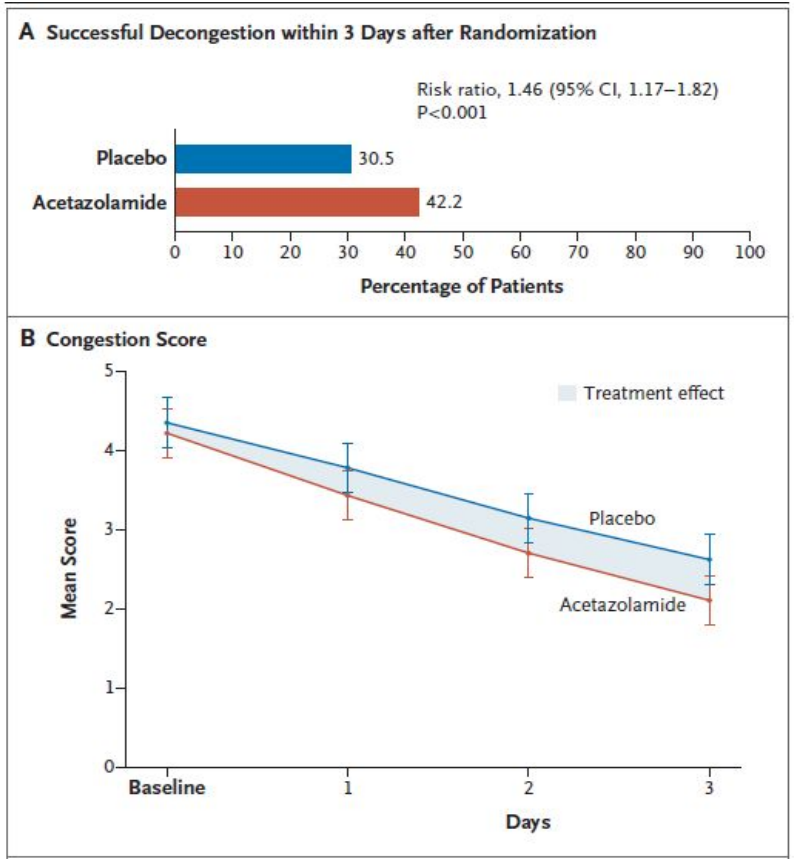
ORIGINAL ARTICLE

Acetazolamide in Acute Decompensated Heart Failure with Volume Overload

Sono stati analizzati 519 ricoverati per insufficienza cardiaca acuta divisi in due corti, una sottoposta a terapia con acetazolamide (500mg al giorno per via endovenosa) l'altra a placebo.

L'utilizzo di acetazolamide si associava a decongestione più efficace e minor incidenza di morte per cause cardiovascolari o reospedalizzazione per scompenso cardiaco a 3 mesi

Mullens et al 2022



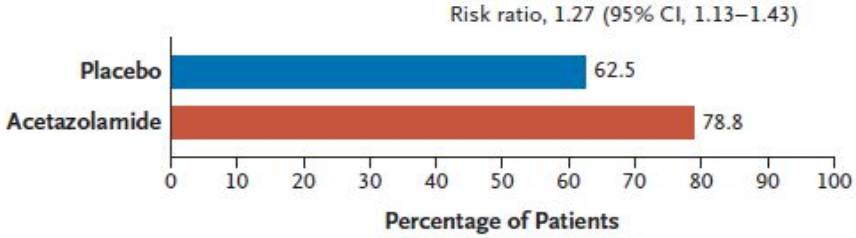


Figure 1. Successful Decongestion and Evolution of Congestion Scores.
The primary end point was successful decongestion, defined as the absence of signs of volume overload, within 3 days after randomization and without an indication for escalation of decongestive therapy. Congestion scores range from 0 to 10 and are defined as the sum of scores for the degree of edema (0 to 4), pleural effusion (0 to 3), and ascites (0 to 3); on all scales, higher scores indicate a worse condition. An exploratory analysis was conducted regarding successful decongestion at discharge among patients who were alive.

Vericiguat

Farmaco attivatore dell'enzima gualinato ciclasi solubile (sGC) e sensibilizzante tale target all'ossido nitrico endogeno

Il GMP sintetizzato attiva a cascata prima le PKG e poi ulteriori proteine con l'effetto netto di promuovere il rilasciamento cardiaco, migliorare il flusso coronarico e ostacolare i processi patologici quali flogosi, ipertrofia e fibrosi cardiaca

Verciguat è un farmaco orale, con elevata biodisponibilità se assunto con il cibo e a prevalente escrezione renale

La dose iniziale è 2,5mg, con dose target 10mg al giorno

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Vericiguat in Patients with Heart Failure and Reduced Ejection Fraction

Paul W. Armstrong, M.D., Burkert Pieske, M.D., Kevin J. Anstrom, Ph.D., Justin Ezekowitz, M.B., B.Ch., Adrian F. Hernandez, M.D., M.H.S., Javed Butler, M.D., M.P.H., M.B.A., Carolyn S.P. Lam, M.B., B.S., Ph.D., Piotr Ponikowski, M.D., Adriaan A. Voors, M.D., Ph.D., Gang Jia, Ph.D.,

5050 pazienti affetti da insufficienza cardiaca a frazione di eiezione inferiore al 45% sono stati divisi in due corti, una sottoposta a terapia con Vericiguat con dose target 10mg e l'altra a placebo

Dopo un follow-up di 10,8 mesi, la terapia con Vericiguat si associava ad una lieve riduzione del rischio di ricovero per scompenso cardiaco e di morte per cause cardiovascolari

Victoria trial 2020

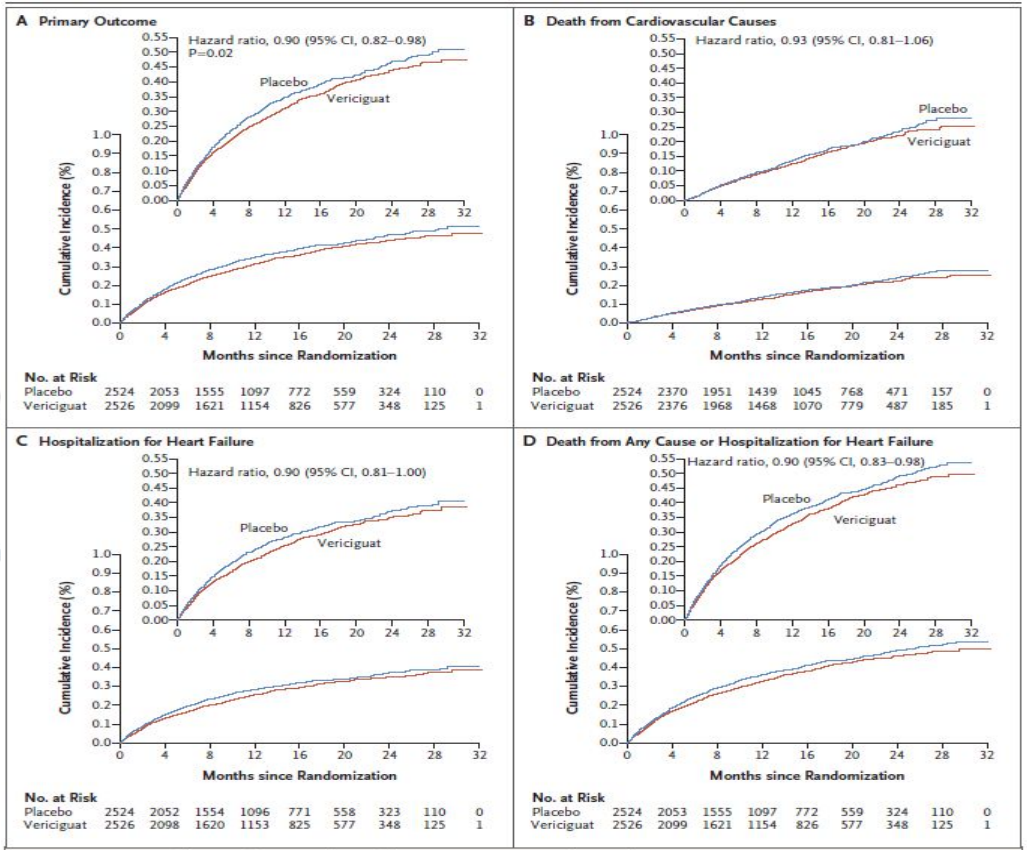
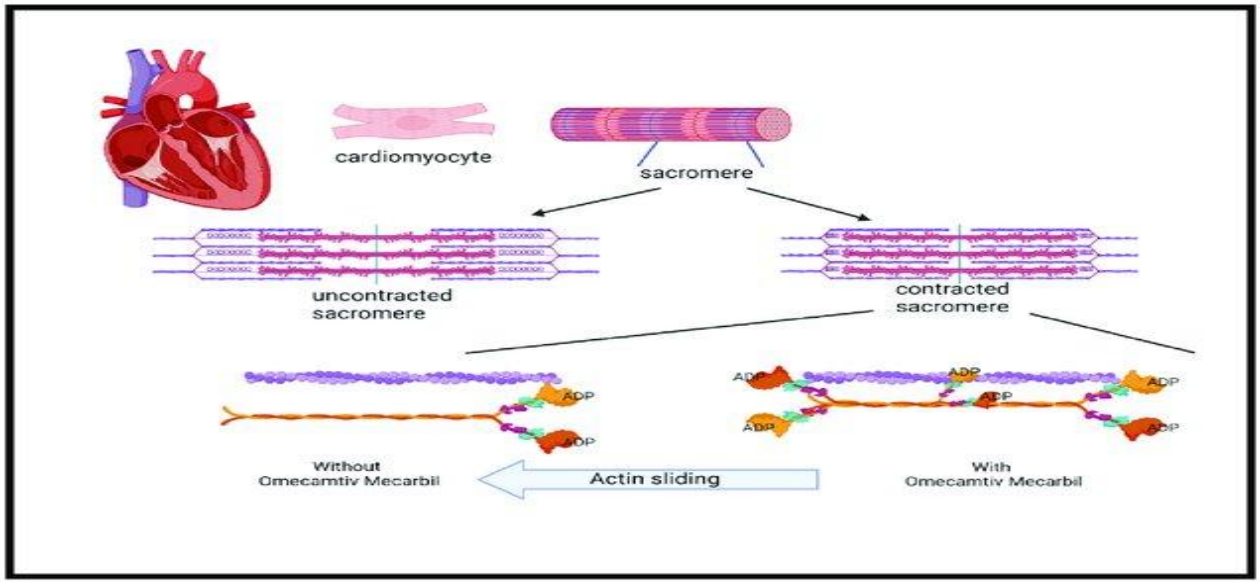


Figure 2. Estimates of the Cumulative Incidence of the Primary Outcome and Secondary Outcomes.

The primary outcome was a composite of death from cardiovascular causes or first hospitalization for heart failure (Panel A). Shown are the cumulative incidences of death from cardiovascular causes (Panel B), first hospitalization for heart failure (Panel C), and the secondary composite outcome (death from any cause or first hospitalization for heart failure) (Panel D). The inset in each panel shows the same data on an enlarged y axis.

Omecamtiv mecarbil

Farmaco attivatore della miosina cardiaca, capostipite di una nuova classe di farmaci che migliorano la contrattilità miocardica agendo direttamente a livello sarcomerico e incrementando il numero delle test miosiniche che si legano ad un filamento di actina.



The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JANUARY 14, 2021 VOL. 384 NO. 2

Cardiac Myosin Activation with Omecamtiv Mecarbil in Systolic Heart Failure

J.R. Teerlink, R. Diaz, G.M. Felker, J.J.V. McMurray, M. Metra, S.D. Solomon, K.F. Adams, I. Anand, A. Arias-Mendoza, T. Biering-Sørensen, M. Böhm, D. Bonderman, J.G.F. Cleland, R. Corbalan, M.G. Crespo-Leiro, U. Dahlström, L.E. Echeverria, J.C. Fang, G. Filippatos, C. Fonseca, E. Goncalvesova, A.R. Goudev, J.G. Howlett, D.E. Lanfear, J. Li, M. Lund, P. Macdonald, V. Mareev, S. Momomura, E. O'Meara, A. Parkhomenko, P. Ponikowski,

8256 pazienti affetti da insufficienza cardiaca a frazione di eiezione inferiore al 35% sono stati divisi in due gruppi, una sottoposta a terapia e l'altra a placebo

Dopo un follow-up di 21,8 mesi, la terapia con omecamtiv mecarbil si associava ad una riduzione dell'endpoint combinato rischio di ricovero per scompenso cardiaco e morte per cause cardiovascolari

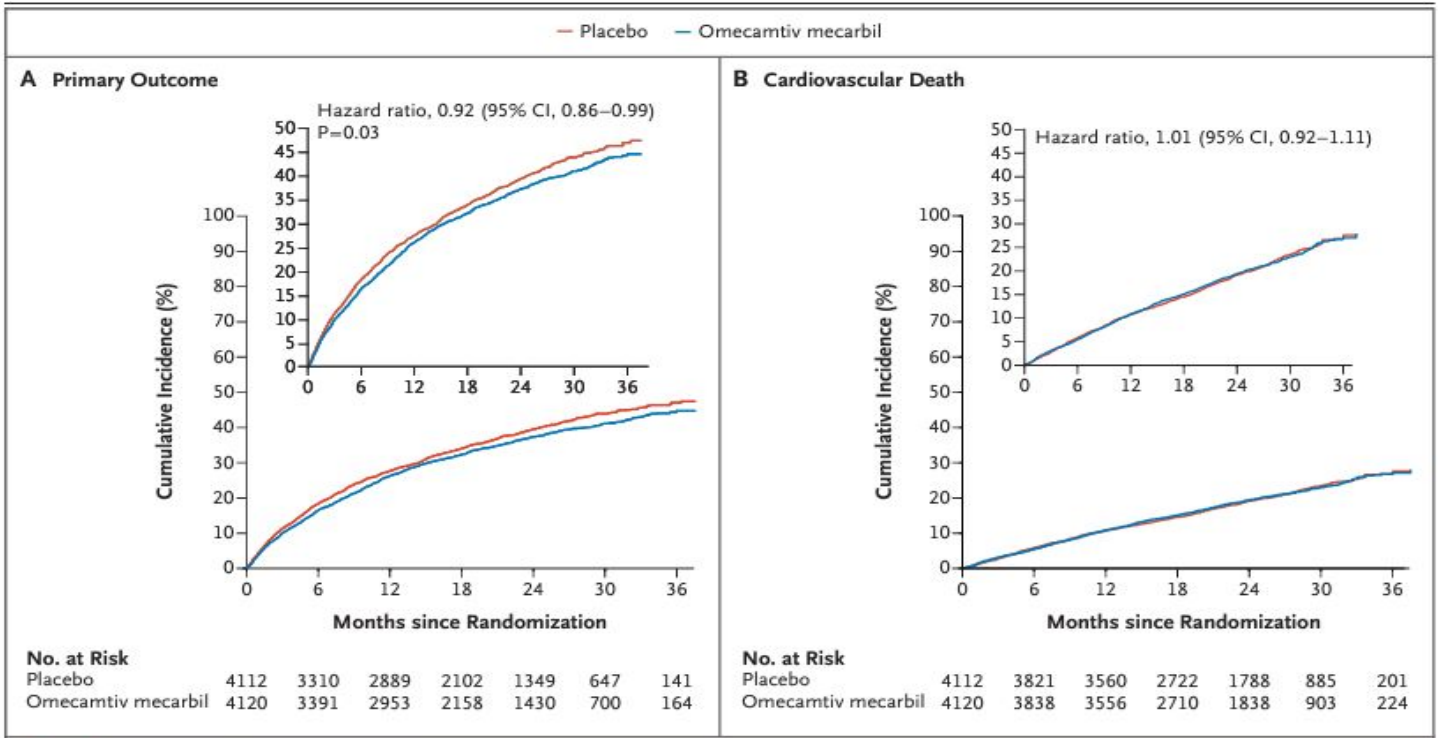
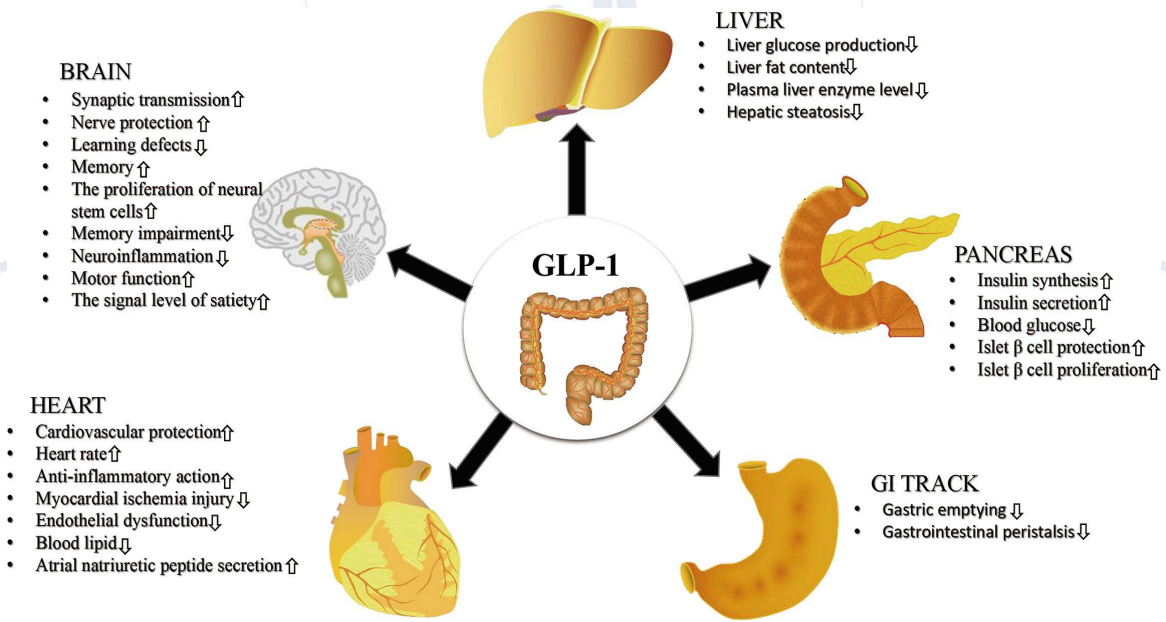


Figure 1. Primary Composite Outcome.

The primary outcome was a composite of a heart-failure event or cardiovascular death, whichever occurred first. The cumulative incidence of the primary composite outcome (Panel A) and death from cardiovascular causes (Panel B) was estimated with the use of the Kaplan–Meier method. Hazard ratios and 95% confidence intervals were estimated with the use of Cox regression models stratified according to randomization location and geographic region, with the trial group as an explanatory variable. Analyses were performed in the intention-to-treat population in the full analysis set. The inset in each panel shows the same data on an enlarged y axis.

Semaglutide

Farmaco agonista del recettore del GLP1, tipicamente utilizzato nel trattamento del diabete mellito di tipo II.
Agisce incrementando la secrezione di insulina glucosio-dipendente, rallentando lo svuotamento gastrico e riducendo l'introito di cibo e la secrezione inappropriata di glucagone.



Front. Endocrinol, Sec. Clinical Diabetes, Volume 12, 23 August 2021.

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 SEPTEMBER 21, 2023 VOL. 389 NO. 12

Semaglutide in Patients with Heart Failure with Preserved Ejection Fraction and Obesity

M.N. Kosiborod, S.Z. Abildstrøm, B.A. Borlaug, J. Butler, S. Rasmussen, M. Davies, G.K. Hovingh, D.W. Kitzman, M.L. Lindegaard, D.V. Møller, S.J. Shah, M.B. Treppendahl, S. Verma, W. Abhayaratna, F.Z. Ahmed, V. Chopra, J. Ezekowitz, M. Fu, H. Ito, M. Lelonek, V. Melenovsky, B. Merkely, J. Núñez, E. Perna, M. Schou, M. Senni, K. Sharma, P. Van der Meer, D. von Lewinski, D. Wolf, and M.C Petrie, for the STEP-HFpEF Trial Committees and Investigators*

CLINICAL TRIAL

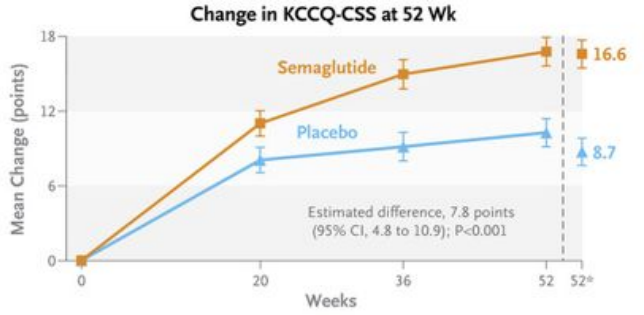
Design: A multinational, double-blind, randomized, placebo-controlled trial evaluated whether treatment with semaglutide — a glucagon-like peptide 1 receptor agonist approved for long-term weight management — would reduce heart failure–related symptoms and improve physical function, in addition to inducing weight loss, in adults with heart failure with preserved ejection fraction and obesity.

Intervention: 529 patients with a body-mass index of ≥30 were assigned to receive subcutaneous semaglutide (2.4 mg) or placebo once weekly for 52 weeks. The dual primary end points were the change in the Kansas City Cardiomyopathy Questionnaire clinical summary score (KCCQ-CSS), which quantifies heart failure–related symptoms and physical function, and the change in body weight from baseline to week 52.

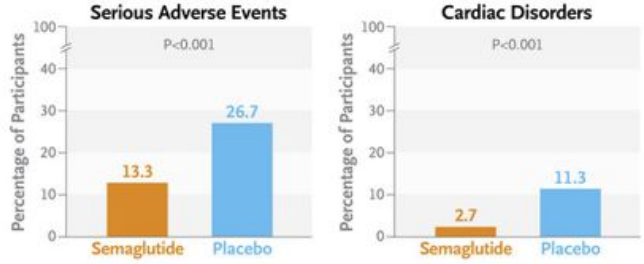
RESULTS

Efficacy: The mean change in KCCQ-CSS and the mean percentage change in body weight were significantly greater with semaglutide than with placebo.

Safety: Serious adverse events occurred less often with semaglutide than with placebo, primarily because fewer cardiac disorders occurred in the semaglutide group. Adverse events leading to treatment discontinuation were more common with semaglutide.



Week 52 data are based on ANCOVA and imputation of missing data.



Finerenone Reduces Risk of Incident Heart Failure in Patients With Chronic Kidney Disease and Type 2 Diabetes: Analyses From the FIGARO-DKD Trial

Gerasimos Filippatos, MD; Stefan D. Anker, MD, PhD; Rajiv Agarwal, MD, MS; Luis Peter Rossing, MD; George L. Bakris, MD; Christoph Tasto, PhD; Amer Joseph, MBBS Andrea Lage, MD; Bertram Pitt, MD; on behalf of the FIGARO-DKD Investigators

BACKGROUND: Chronic kidney disease and type 2 diabetes are independently assoc cause of morbidity and mortality. In the FIDELIO-DKD (Finerenone in Reducing K in Diabetic Kidney Disease) and FIGARO-DKD (Finerenone in Reducing Cardiovas Kidney Disease) trials, finerenone (a selective, nonsteroidal mineralocorticoid recep outcomes in patients with albuminuric chronic kidney disease and type 2 diabe FIGARO-DKD assessed the effect of finerenone on clinically important HF outcom

METHODS: Patients with type 2 diabetes and albuminuric chronic kidney disease (u <300 mg/g and estimated glomerular filtration rate ≥25 to ≤90 mL per min per 1.73 ≥300 to ≤5000 mg/g and estimated glomerular filtration rate ≥60 mL per min per reduced ejection fraction, were randomized to finerenone or placebo. Time-to-first-e (first hospitalization for HF [HHF] in patients without a history of HF at baseline); related death or first HHF; first HHF; cardiovascular death or total (first or recurren and total HHF. Outcomes were evaluated in the overall population and in prespecifie

RESULTS: Overall, 7352 patients were included in these analyses; 571 (7.8%) had a hi was significantly reduced with finerenone versus placebo (1.9% versus 2.8%; hazard *P*=0.0162). In the overall population, the incidences of all HF outcomes analyzed w than placebo, including an 18% lower risk of cardiovascular death or first HHF (HR a 29% lower risk of first HHF (HR, 0.71 [95% CI, 0.56–0.90]; *P*=0.0043) and a 30% lower rate of total HHF (rate ratio, 0.70 [95% CI, 0.52–0.94]). The effects of finerenone on improving HF outcomes were not modified by a history of HF. The incidence of treatment-emergent adverse events was balanced between treatment groups.

CONCLUSIONS: The results from these FIGARO-DKD analyses demonstrate that finerenone reduces new-onset HF and improves other HF outcomes in patients with chronic kidney disease and type 2 diabetes, irrespective of a history of HF.

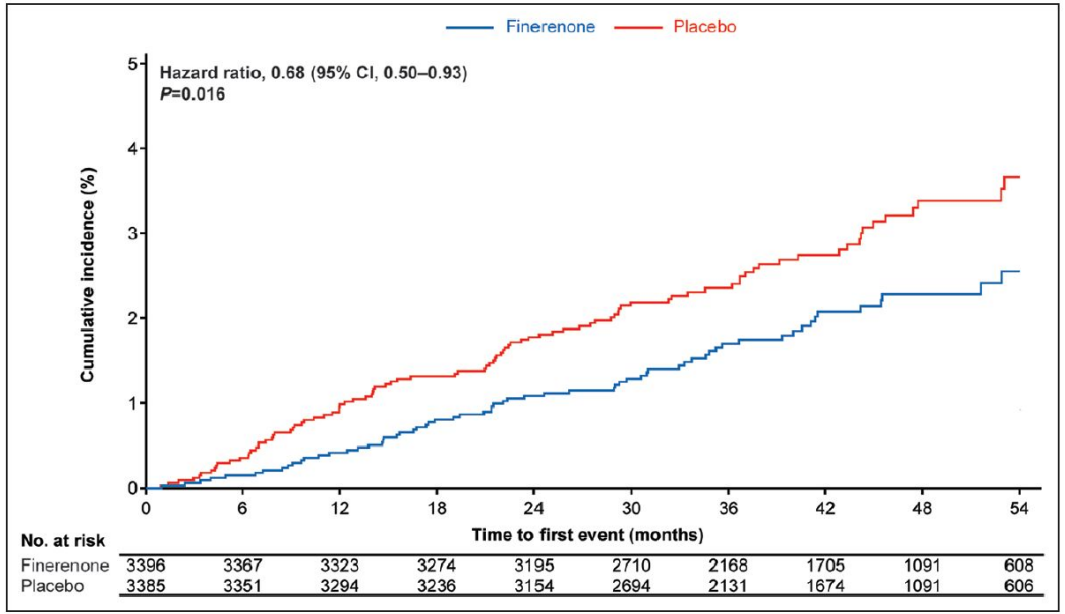
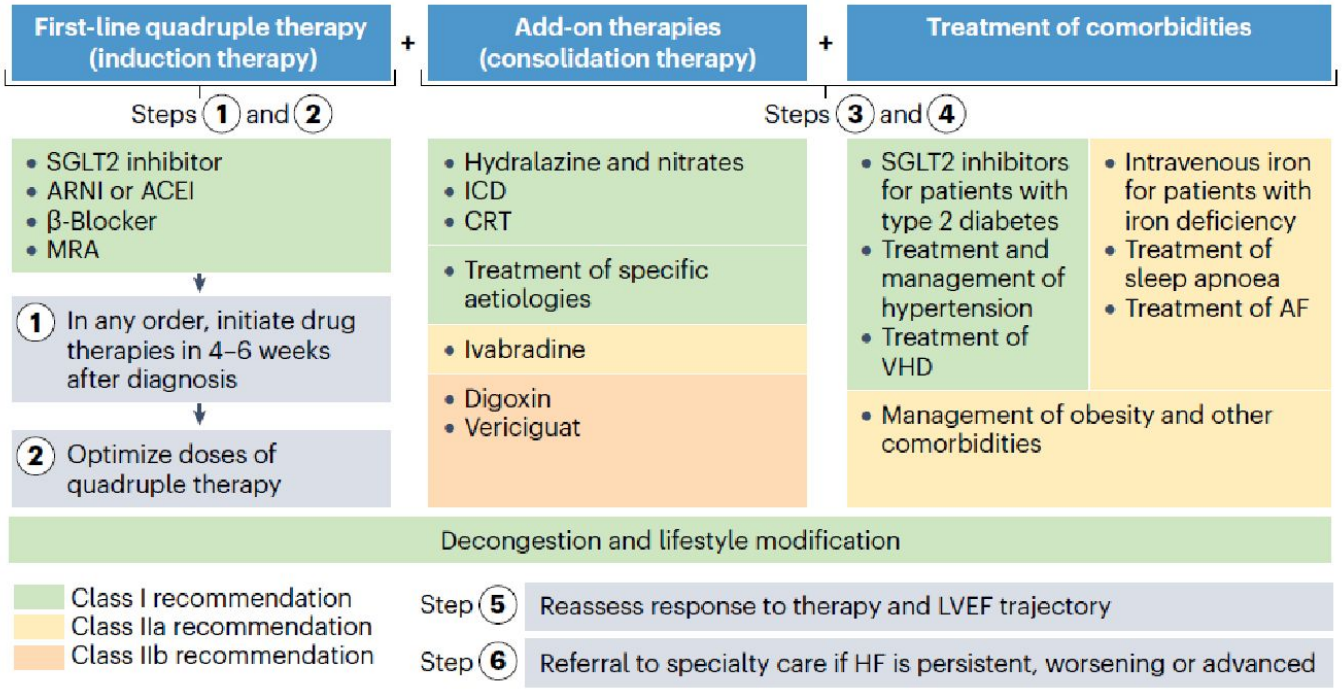
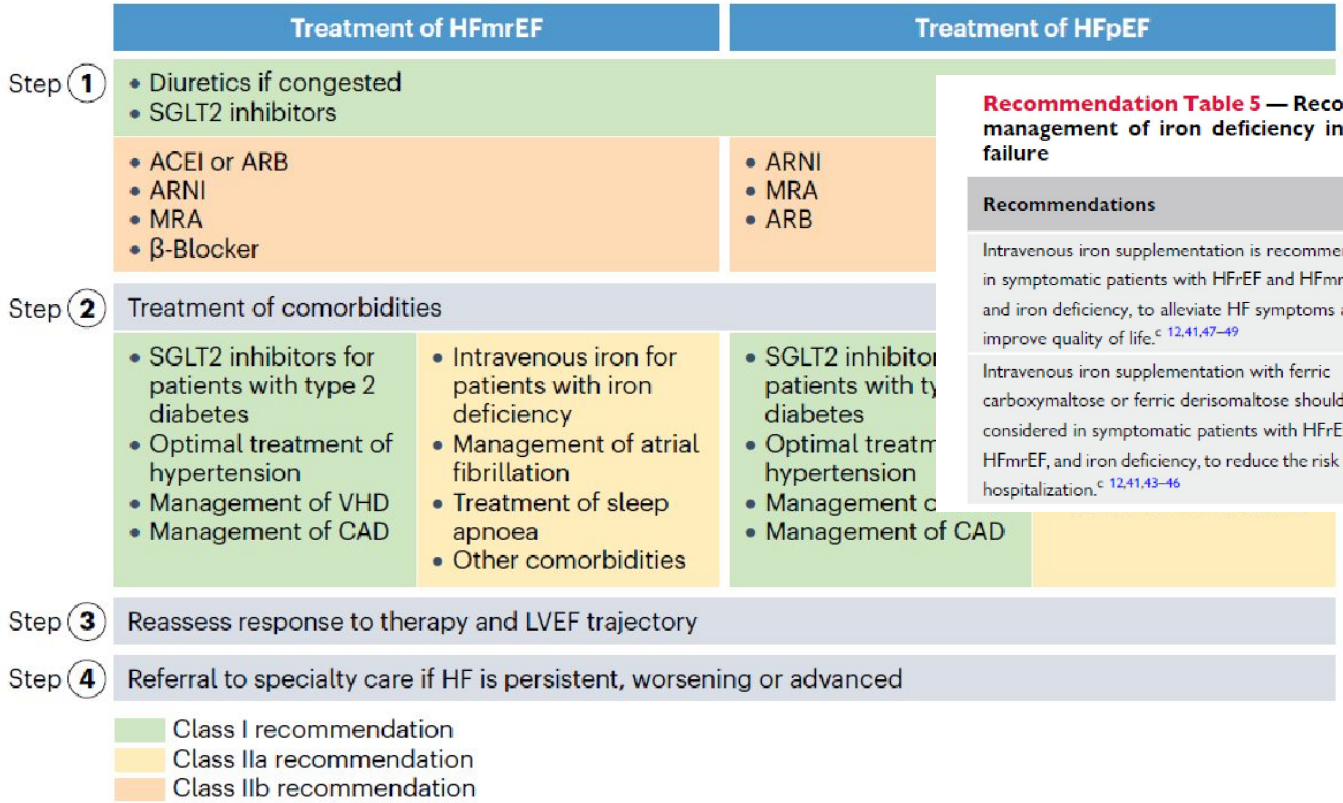


Figure 1. Kaplan-Meier estimate of time to new-onset HF (first hospitalization for HF in patients without a history of HF at baseline).
HF indicates heart failure.

Stepwise initiation and optimization of pharmacologic therapy in heart failure with reduced EF



Stepwise initiation and optimization of pharmacologic therapy in heart failure with mr EF and pEF



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

Randomized Controlled Trial Lancet. 2022 Dec 3;400(10367):1938-1952.
doi: 10.1016/S0140-6736(22)02076-1. Epub 2022 Nov 7.

Safety, tolerability and efficacy of up-titration of guideline-directed medical therapies for acute heart failure (STRONG-HF): a multinational, open-label, randomised, trial

Alexandre Mebazaa [1], Beth Davison [2], Ovidiu Chioncel [3], Alain Cohen-Solal [4], Rafael Diaz [5],

usual care or high-intensity care. Usual care followed usual local practice, and high-intensity care involved the up-titration of treatments to 100% of recommended doses within 2 weeks of discharge and four scheduled outpatient visits over the 2 months after discharge that closely monitored clinical status, laboratory values, and N-terminal pro-B-type natriuretic peptide (NT-proBNP) concentrations. The primary endpoint was 180-day readmission to hospital due to heart failure or all-cause death.

I dati dell'ambulatorio scompenso del PS-OB Careggi dal 2022 al 2023

Caratteristiche cliniche	Numero (151)
Età	80,44±8,33
Genere	
Uomini	89 (58,94%)
Donne	62 (41,05%)
	(27,8%)
	(38,4%)
	(33,8%)
	(31,78%)
	6 (90,06%)
Obesità	24 (15,89%)
Tabagismo	25 (16,55%)
Cardiopatia ischemica	32 (21,29%)
Fibrillazione atriale	61 (40,39%)
Malattia renale cronica	78 (51,65%)

Farmaci prescritti alla dimissione	N
ACE inibitori	50
ARB	51
Beta bloccante	48
Diuretici dell'ansa	112 (74,2%)
MRA	58 (38,41%)
ARNI	58 (38,41%)
Glifozine	24 (15,89%)

Recommendation Table 3 — Recommendation for pre-discharge and early post-discharge follow-up of patients hospitalized for acute heart failure

Recommendation	Class[a]	Level[b]
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.[c,d,e] [16]	I	B

Conclusioni

- Le glifozine costituiscono un nuovo paradigma della terapia dell'insufficienza cardiaca a prescindere dalla presenza o meno di diabete, dalla frazione di eiezione dimostrando una azione diuretica nefroprotettiva

- Una vasta gamma di farmaci di nuova generazione sono in corso di studio e valutazione con apertura a breve di nuovi scenari terapeutici

- Appare fondamentale la creazione di percorsi per la rivalutazione dei pazienti a breve termine (1 settimana/ 1mese)

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