DIBATTITO: L'importanza del controllo dei fattori di rischio cardio-metabolico con la terapia del diabete tipo 2

Roberto Minutolo
Università della Campania Luigi Vanvitelli

Disclosures

Il prof. Roberto Minutolo dichiara di aver ricevuto negli ultimi due anni compensi o finanziamenti dalle seguenti Aziende Farmaceutiche e/o Diagnostiche:

- Amgen
- Astellas
- Astrazeneca
- Bayer
- Boehringer
- CSL Vifor
- Eli Lily
- Novo Nordisk,

Dichiara altresì il proprio impegno ad astenersi, nell'ambito dell'evento, dal nominare, in qualsivoglia modo o forma, aziende farmaceutiche e/o denominazione commerciale e di non fare pubblicità di qualsiasi tipo relativamente a specifici prodotti di interesse sanitario (farmaci, strumenti, dispositivi medico-chirurgici, ecc.).

Global, regional, and national burden of chronic kidney disease in adults, 1990–2023, and its attributable risk factors: a systematic analysis for the Global Burden of Disease Study 2023

*GBD 2023 Chronic Kidney Disease Collaborators**

Lancet 2025; 406: 2461–82

	Prevalence		
	Count (thousands), 2023	Age-standardised prevalence (%), 2023	Percentage change in age-standardised prevalence between 1990 and 2023 (%)
Global	788 000 (743 000 to 843 000)	14·2% (13·4 to 15·2)	3·5% (2·7 to 4·1)
Low SDI	111 000 (103 000 to 120 000)	15·2% (14·4 to 16·2)	−3·2% (−3·8 to −2·5)
Low-middle SDI	106 000 (99 000 to 114 000)	16·1% (15·2 to 17·3)	−6·5% (−7·1 to −5·8)
Middle SDI	96 800 (90 600 to 104 000)	16·3% (15·3 to 17·6)	4·3% (3·7 to 5·0)
High-middle SDI	185 000 (175 000 to 197 000)	15·1% (14·3 to 16·2)	3·0% (2·0 to 3·9)
High SDI	283 000 (267 000 to 303 000)	12·2% (11·5 to 13·1)	4·4% (3·4 to 5·3)

SDI=Sociodemographic Index

	Prevalence		
	Count (thousands), 2023	Age-standardised prevalence (%), 2023	Percentage change in age-standardised prevalence between 1990 and 2023 (%)
Italy	6120 (5760 to 6560)	8·2% (7·7 to 8·8)	−3·9% (−4·5 to −3·2)

Burden of disease scenarios for 204 countries and territories, 2022–2050: a forecasting analysis for the Global Burden of Disease Study 2021

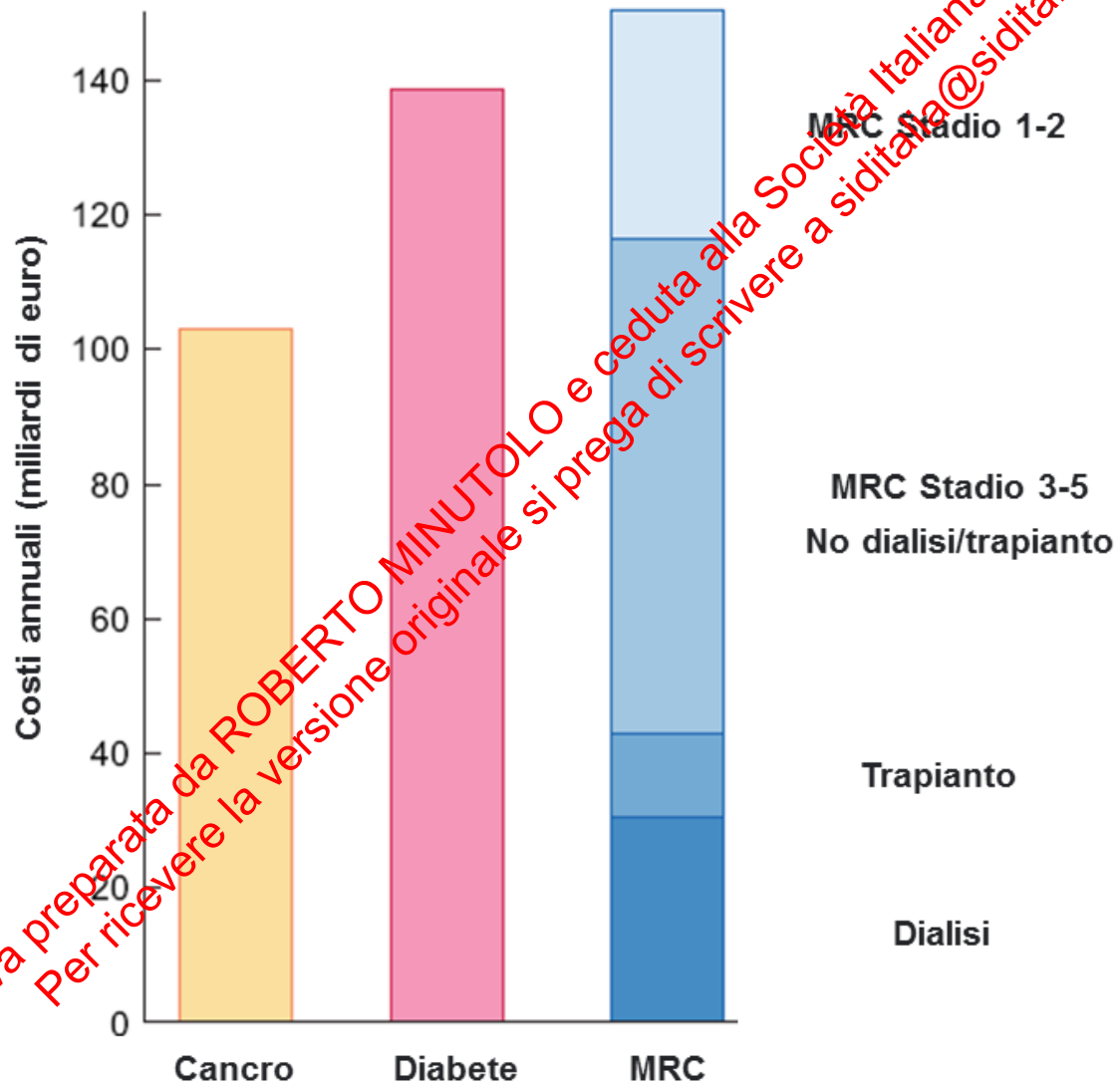
GBD 2021 Forecasting Collaborators*

Lancet 2024; 403: 2204–56

Stima dell'aumento di mortalità dovuta alla CKD tra il 2023 e il 2050

Leading causes 2022	Leading causes 2050	Mean percentage change in number of deaths	Mean percentage change in all-age death rate	Mean percentage change in age-standardised death rate
1 Ischaemic heart disease	1 Ischaemic heart disease	20·6 (–12·7 to 64)	2·69 (–27 to 44·4)	**–44·8 (–64·3 to –15·4)**
2 Stroke	2 Stroke	**28·5 (7·88 to 51·1)**	9·27 (–7·5 to 30·9)	**–41·3 (–53·4 to –25·9)**
3 COPD	3 COPD	**102 (66·1 to 141)**	**71·8 (40·1 to 113)**	–13·7 (–34·3 to 15·6)
4 Lower respiratory infections	4 Alzheimer's disease	**173 (124 to 222)**	**132 (95 to 168)**	**–3·48 (–5·38 to –1·07)**
5 COVID-19	5 Chronic kidney disease	**182 (126 to 245)**	**140 (90·5 to 202)**	33·1 (–0·751 to 79)
6 Lung cancer	6 Lower respiratory infections	**56·7 (42·3 to 69·5)**	**33·3 (20·1 to 46·5)**	**–26·6 (–36·8 to –13·3)**
7 Alzheimer's disease	7 Hypertensive heart disease	**165 (105 to 232)**	**126 (74·3 to 192)**	17·1 (–16·5 to 61)
8 Neonatal disorders	8 Lung cancer	**68·1 (24·5 to 117)**	**42·7 (8·87 to 80·4)**	–17 (–31·9 to 0·776)
9 Diabetes	9 Diabetes	**76·2 (43·2 to 115)**	**49·9 (18·6 to 89·6)**	–13·9 (–33·8 to 14·9)
10 Chronic kidney disease	10 Cirrhosis liver	**50·7 (34·5 to 67)**	**28·2 (12·6 to 45·3)**	–9·06 (–20·9 to 6·14)
11 Cirrhosis liver	11 Colorectal cancer	**103 (41·1 to 177)**	**72·1 (23·7 to 131)**	–3·02 (–24·8 to 23·1)
12 Hypertensive heart disease	12 Falls	**113 (82·1 to 146)**	**81·3 (58·4 to 107)**	**–5·34 (–10·6 to –0·215)**
13 Road injuries	13 Diarrhoeal diseases	30·9 (–0·247 to 68·6)	**11·4 (–16·5 to 47·9)**	–34 (–54·1 to 0·13)
14 Tuberculosis	14 Road injuries	9·8 (–24·3 to 61·4)	–6·52 (–36·1 to 41·6)	–18·1 (–46·7 to 28·6)
15 Diarrhoeal diseases	15 Pancreatic cancer	**140 (72·1 to 219)**	**104 (50·3 to 169)**	18·1 (–6·89 to 46·9)
16 Colorectal cancer	16 Breast cancer	**81·8 (36·1 to 137)**	**54·4 (17·9 to 96·1)**	1·42 (–18·9 to 24·8)
17 Stomach cancer	17 Stomach cancer	**24·7 (12·6 to 37)**	5·99 (–3·94 to 16·1)	**–38·1 (–41·6 to –34·4)**
18 Falls	18 Atrial fibrillation	**229 (177 to 278)**	**179 (143 to 216)**	**17·3 (11·9 to 22·5)**
19 Self-harm	19 Urinary diseases	**203 (176 to 225)**	**158 (133 to 182)**	**33·5 (11·4 to 60)**
20 Malaria	20 Prostate cancer	**145 (86 to 209)**	**108 (60·6 to 158)**	5·51 (–8·93 to 23)

Il "peso" della Malattia Renale Cronica – Costi in Europa



Vanholder, Clin Kidney J 2021

Missing Opportunity for Nephroprotective Therapy in Patients With Non-Dialysis CKD Under Stable Nephrology Care

Luca De Nicola[1], Chiara Ruotolo[1], Gaetano La Manna[2,3], Vincenzo Bellizzi[4], Loreto Gesualdo[5], Felice Nappi[6], Pietro Manuel Ferraro[7,8], Carmelita Marcantoni[9], Domenico Santoro[10], Giovanni Stallone[11], Antonio Pisani[12], Cataldo Abaterusso[13], Adamasco Cupisti[14], Luigi Vernaglione[15], Maura Ravera[16], Mario Cozzolino[17], Maurizio Gallieni[18], Federico Alberici[19], Marcellino Corvinelli[20], Yuri Battaglia[7,21], Alessandro Capitanini[22], Filippo Aucella[23], Giuseppe Castellano[24], Mariadelina Simeoni[25], Michele Provenzano[26], Mario Bonomini[27], Gianpaolo Reboldi[28], Angelo Ferrantelli[29], Ciro Esposito[30,31], Gianfranca Cabiddu[32], Giuseppe Grandaliano[33] and Roberto Minutolo[1];

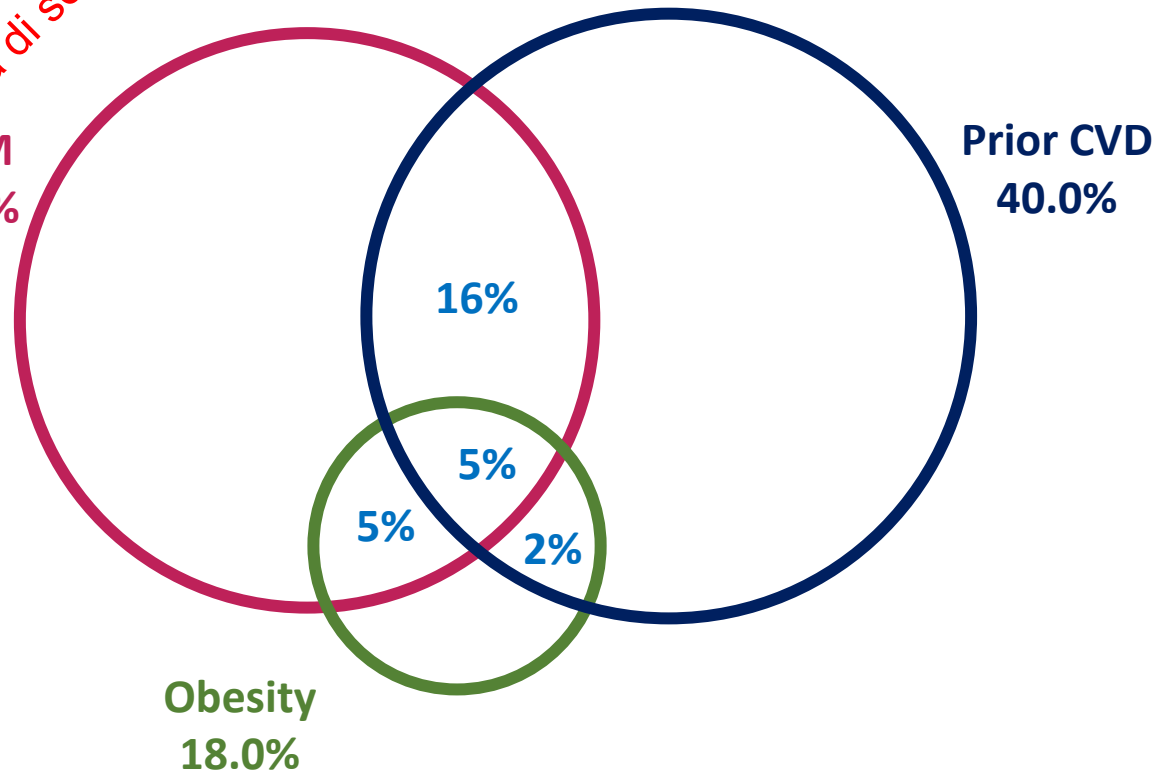
Kidney International Reports (2026) **11**, 106541

Risk profile of 4,523 patients with ND-CKD, (stage 3-5 or 1-2 with UACR>30 mg/g), followed in 30 Italian nephrology clinics

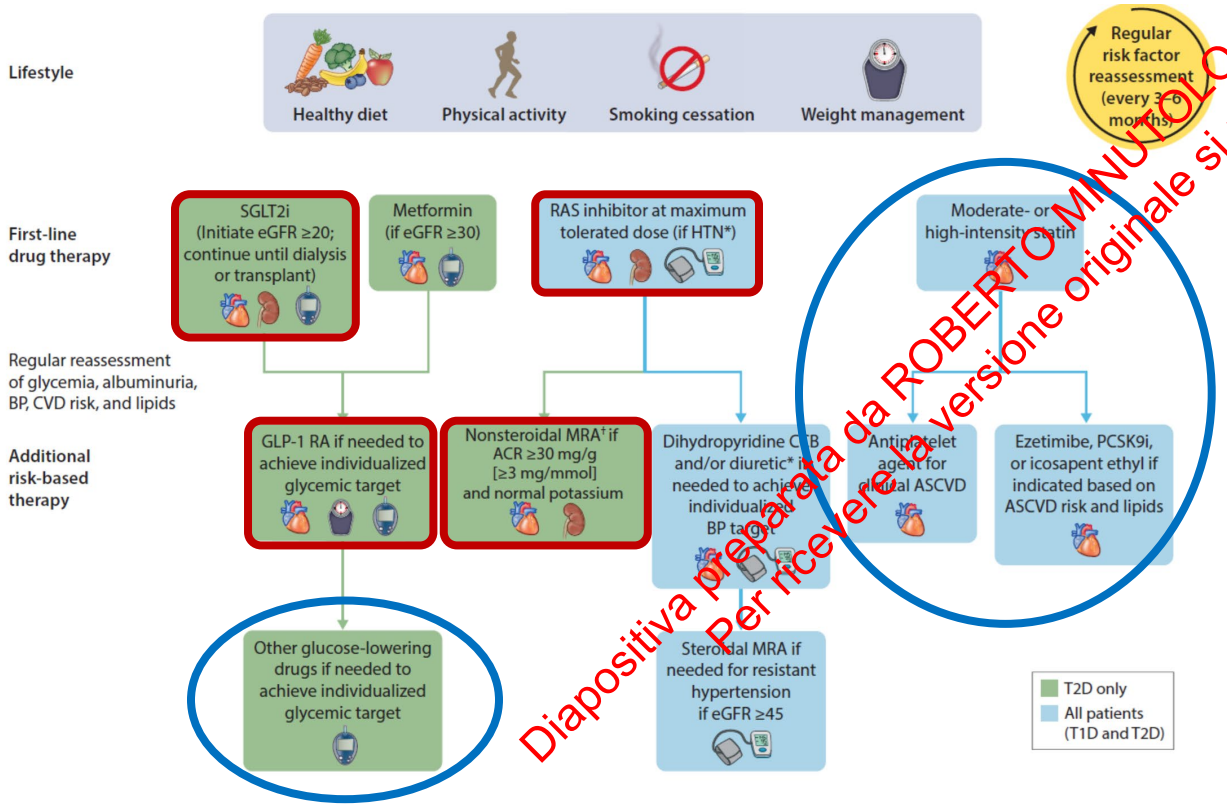
With diabetes *(N=1807)*

GFR categories (mL/min/1.73m²)	Albuminuria categories: A1 Normal to Mild ACR <30 mg/g	A2 Moderate ACR 30-300 mg/g	A3 Severe ACR >300 mg/g
>90	0.1% (N=1)	0.6% (N=10)	0.2% (N=4)
89-60	0.8% (N=15)	1.4% (N=25)	1.5% (N=28)
59-45	6.1% (N=111)	6.1% (N=111)	2.9% (N=53)
44-30	13.2% (N=239)	11.8% (N=214)	7.6% (N=137)
29-15	10.4% (N=188)	13.0% (N=235)	11.3% (N=203)
<15	3.4% (N=62)	3.7% (N=66)	5.8% (N=105)

- Low risk: 0.9%
- Moderately increased risk: 8.1%
- High risk: 21.1%
- Very high risk: 69.9%



Los cuatro postes, Avila, Spagna



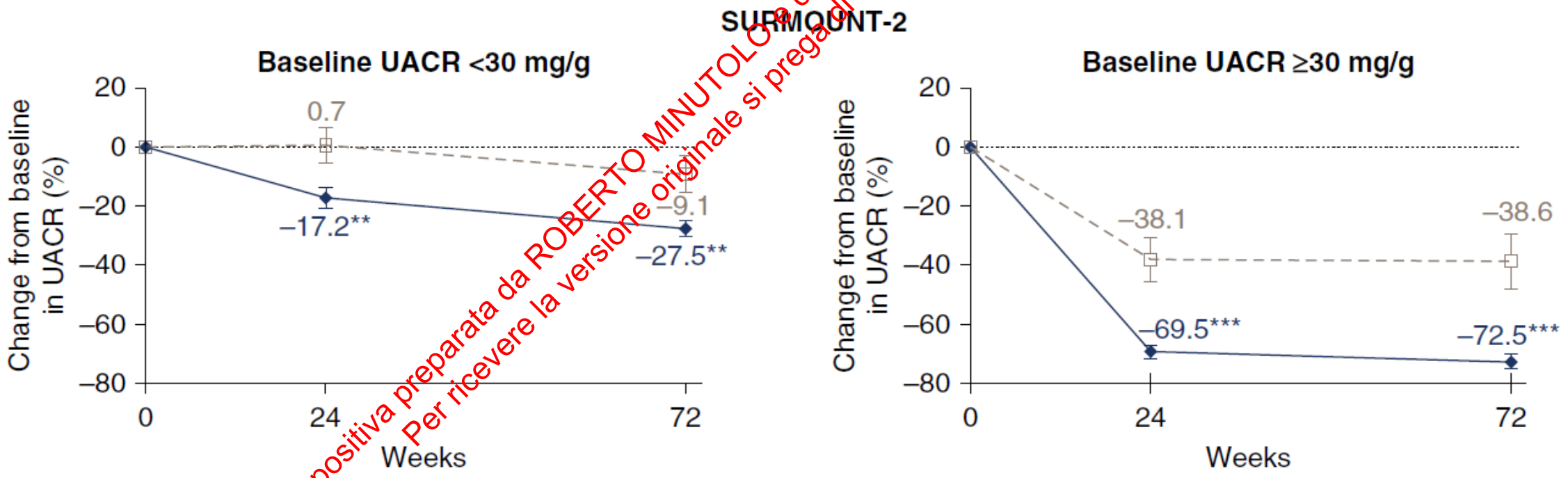
Foro di Pompei, Parco archeologico di Pompei

Kidney Parameters with Tirzepatide in Obesity with or without Type 2 Diabetes

Hiddo J.L. Heerspink,[1] Allon N. Friedman,[2] Petter Bjornstad,[3] Daniel H. van Raalte,[4] David Cherney,[5] Dachuang Cao,[6] Luis-Emilio Garcia-Pérez,[6] Adam Stefanski,[6] Ibrahim Turfanda,[6] Mathijs C. Bunck,[6] Imane Benabbad,[6] Ryan Griffin,[6] and Carolina Piras de Oliveira[6]

3. Tirzepatide reduces UACR particularly in those with A2-A3

Pooled analysis of SURMOUNT-1 (obesity no T2D) and SURMOUNT-2 (T2D) trials to evaluate the effect of tirzepatide vs placebo on UACR



JASN 36: 2190–2200, 2025.

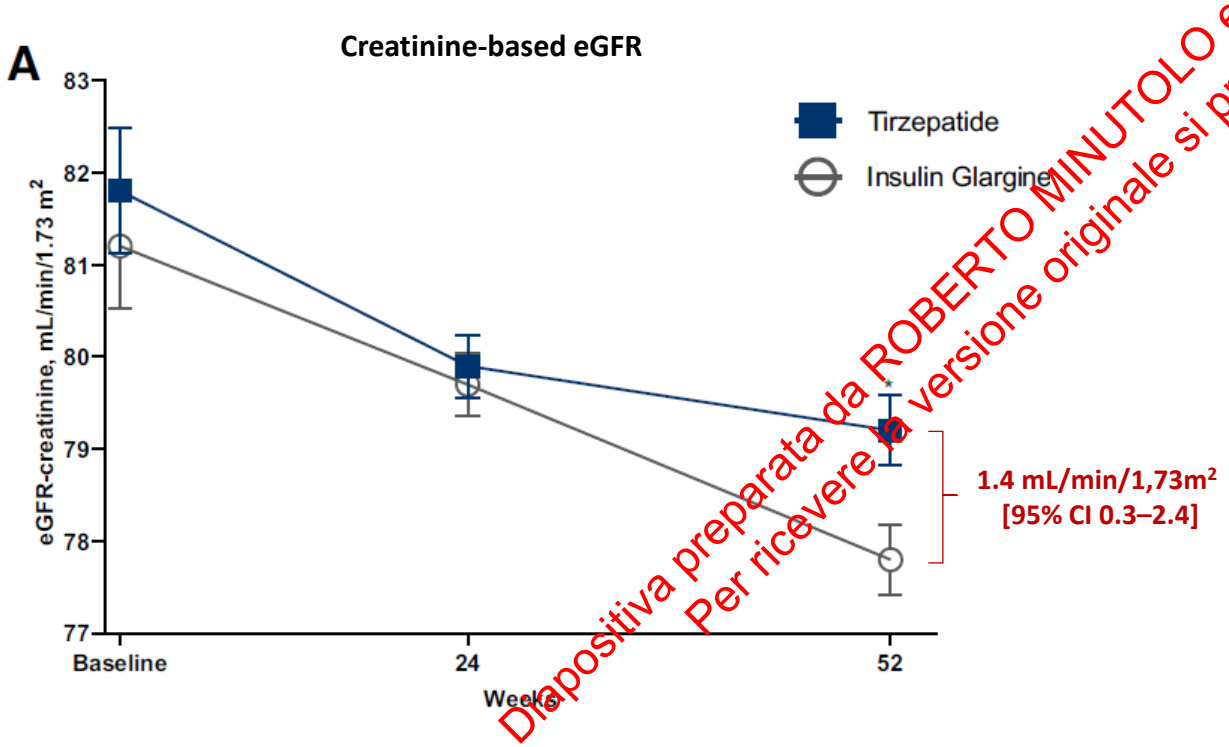
Effects of Tirzepatide Versus Insulin Glargine on Cystatin C–Based Kidney Function: A SURPASS-4 Post Hoc Analysis

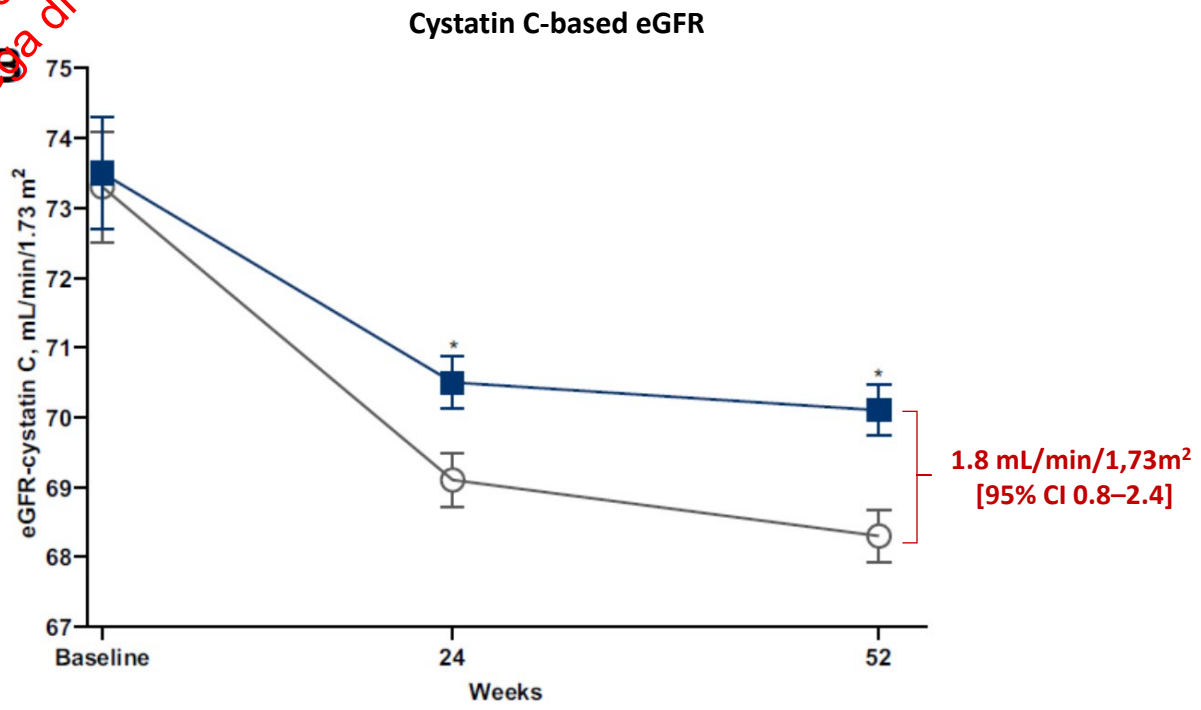
Hiddo J.L. Heerspink,[1,2] Naveed Sattar,[3] Imre Pavo,[4] Axel Haupt,[4] Kevin L. Duffin,[4] Zhengyu Yang,[4] Russell J. Wiese,[4] Jonathan M. Wilson,[4] Andrea Hemmingway,[4] David Z.I. Cherney,[5] and Katherine R. Tuttle[6]

Diabetes Care 2023;46:1501–1506 | https://doi.org/10.2337/dc23-0261

3. Tirzepatide reduces eGFR decline

Post-hoc analysis of SURPASS-4 study, to evaluate pooled doses of tirzepatide (n=995) vs insulin glargine (n=1,000) on eGFR at 52 wks





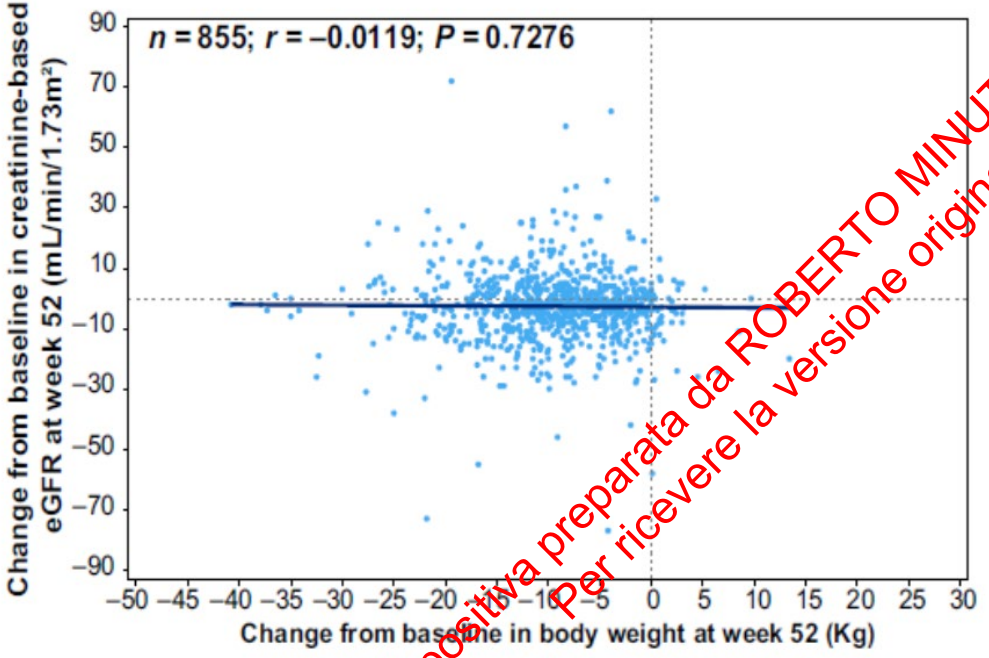
Effects of Tirzepatide Versus Insulin Glargine on Cystatin C–Based Kidney Function: A SURPASS-4 Post Hoc Analysis

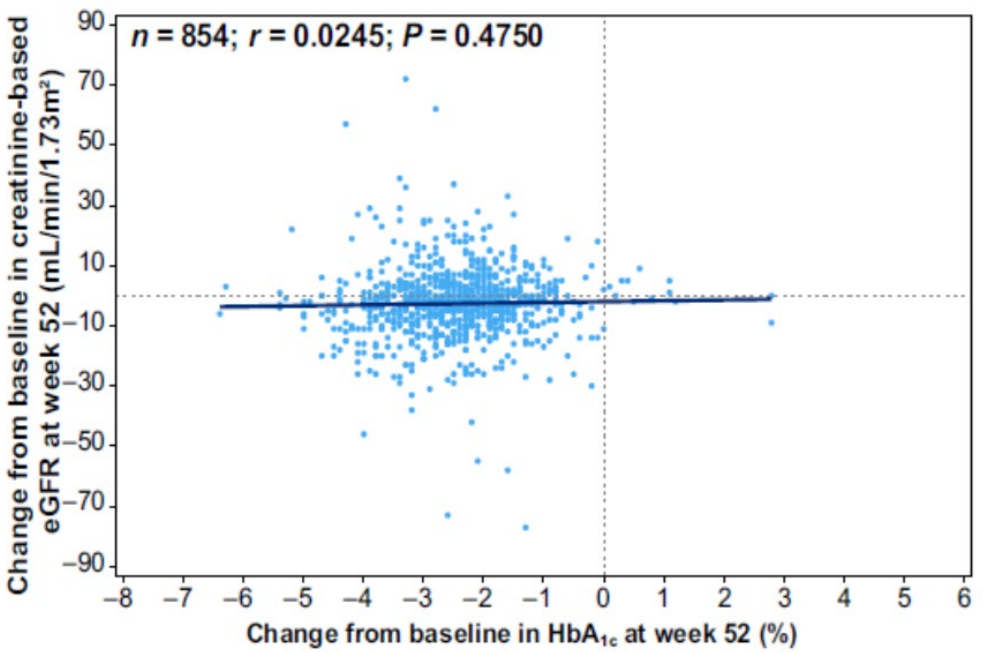
Diabetes Care 2023;46:1501–1506 | https://doi.org/10.2337/dc23-0261

Hiddo J.L. Heerspink,[1,2] Naveed Sattar,[3] Imre Pavo,[4] Axel Haupt,[4] Kevin L. Duffin,[4] Zhengyu Yang,[4] Russell J. Wiese,[4] Jonathan M. Wilson,[4] Andrea Hemmingway,[4] David Z.I. Cherney,[5] and Katherine R. Tuttle[6]

3. Tirzepatide reduces eGFR decline independently from BMI and HbA1c

Post-hoc analysis of SURPASS-4 study, to evaluate pooled doses of tirzepatide (n=995) vs insulin glargine (n=1,000) on eGFR at 52 wks



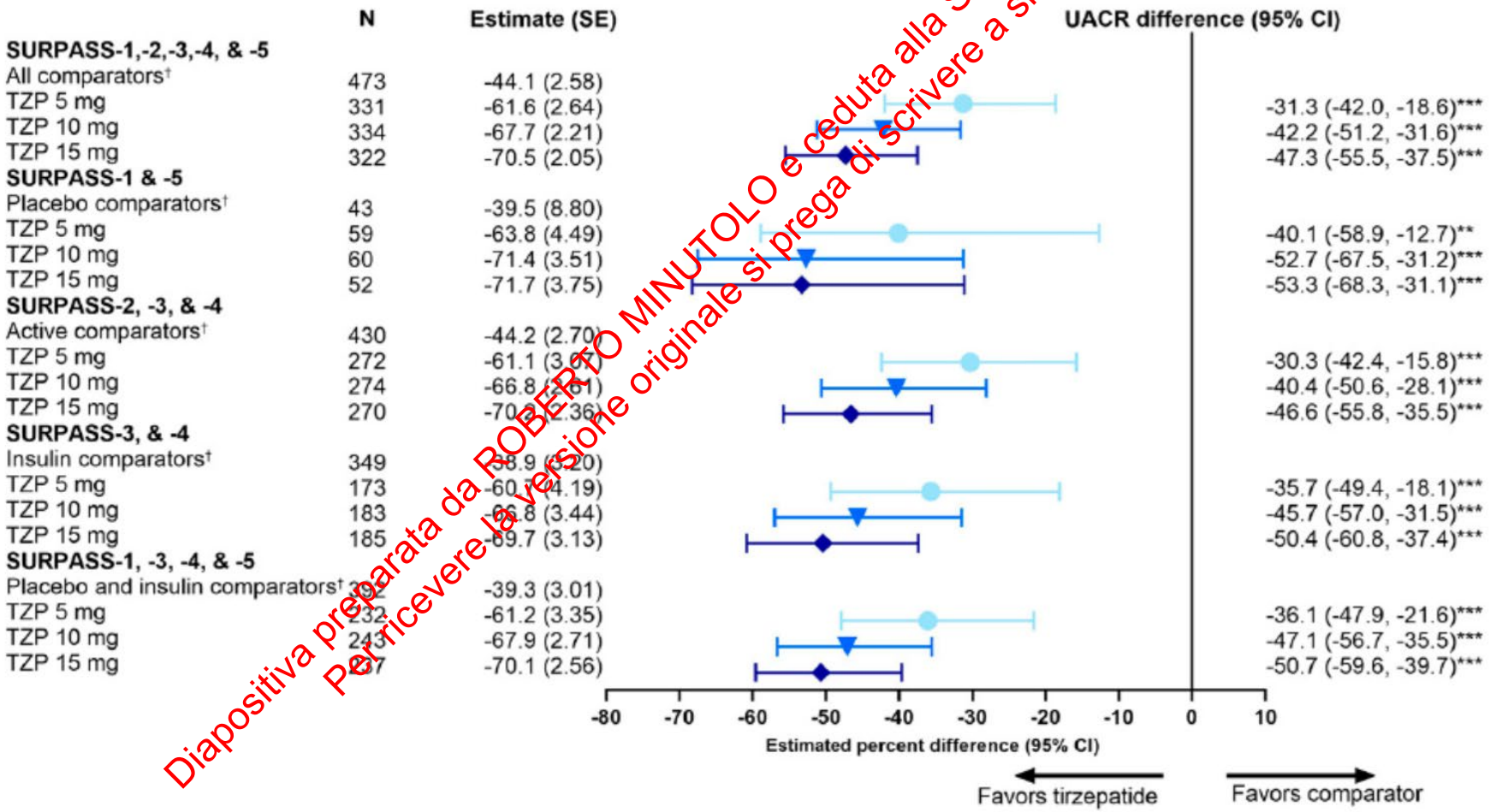


Tirzepatide Associated With Reduced Albuminuria in Participants With Type 2 Diabetes: Pooled Post Hoc Analysis From the Randomized Active- and Placebo-Controlled SURPASS-1–5 Clinical Trials

Ellen M. Apperloo,[1] Katherine R. Tuttle,[2,3] Imre Pavo,[4] Axel Haupt,[4] Rebecca Taylor,[4] Russell J. Wiese,[4] Andrea Hemmingway,[4] David Z.I. Cherney,[5] Naveed Sattar,[6] and Hiddo J.L. Heerspink[1,7]

Diabetes Care 2025;48:430–436

4. Tirzepatide reduces UACR particularly in those with A2-A3 in and in dose-dependent manner

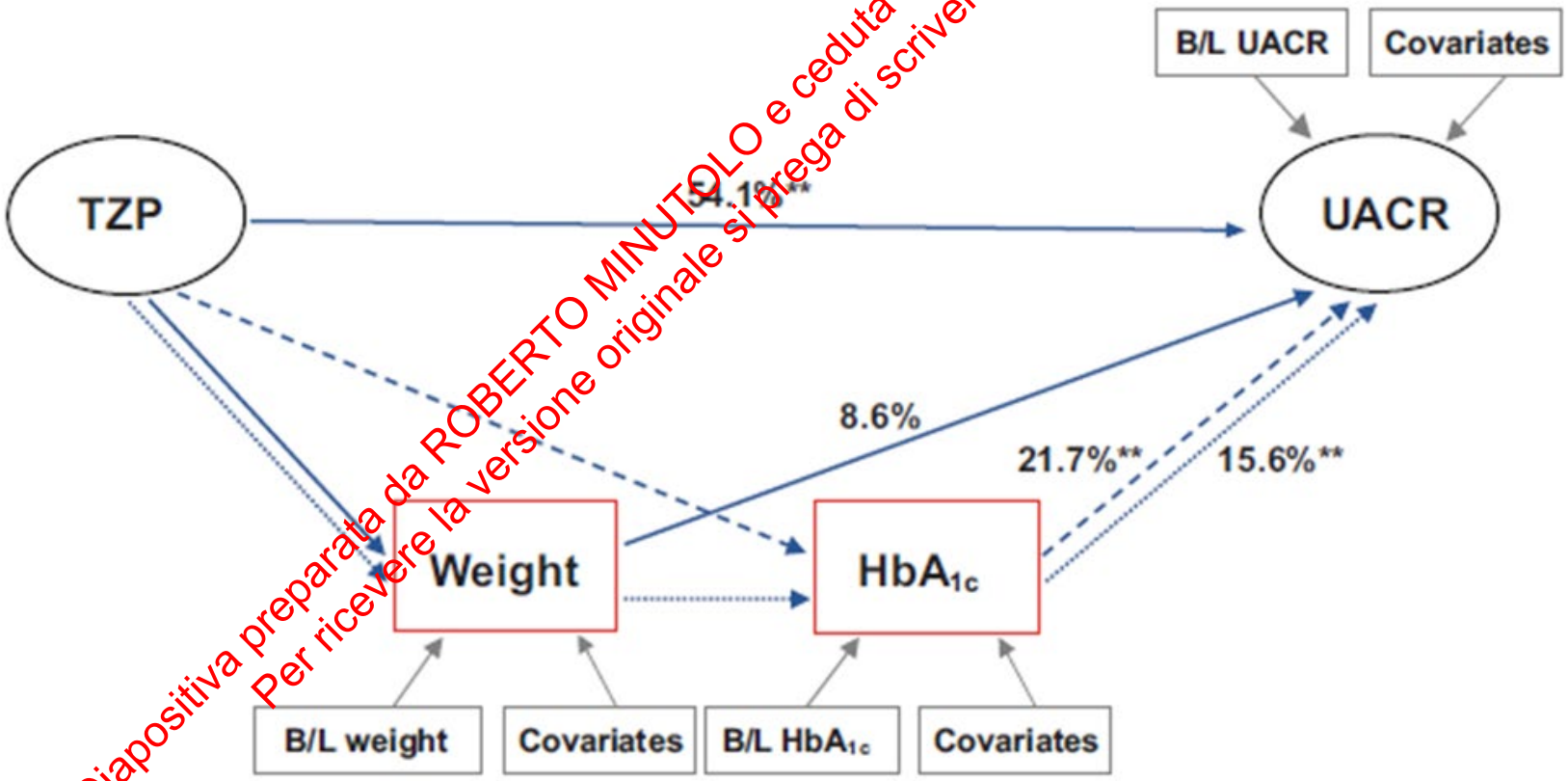


Tirzepatide Associated With Reduced Albuminuria in Participants With Type 2 Diabetes: Pooled Post Hoc Analysis From the Randomized Active- and Placebo-Controlled SURPASS-1–5 Clinical Trials

Ellen M. Apperloo,[1] Katherine R. Tuttle,[2,3] Imre Pavo,[4] Axel Haupt,[4] Rebecca Taylor,[4] Russell J. Wiese,[4] Andrea Hemmingway,[4] David Z.I. Cherney,[5] Naveed Sattar,[6] and Hiddo J.L. Heerspink[1,7]

Diabetes Care 2025;48:430–436 | https://doi.org/10.2337/dc24-1773

5. Tirzepatide induces dose-dependent UACR decline largely independent from ↓ B.W. and ↓ HbA1c



A comparison of the effects of tirzepatide and dulaglutide on major kidney events in people with type 2 diabetes: pre-specified exploratory analyses of the SURPASS-CVOT trial

	Tirzepatide (n=1520)	Dulaglutide (n=1403)	Hazard ratio (95% CI)	p value
High-risk chronic kidney disease population				
Number of participants	1520	1403	..	..
Primary composite kidney outcome	185 (12·2%)	203 (14·5%)	0·79 (0·64 to 0·96)	0·018
Composite kidney outcome 2	150 (9·9%)	152 (10·8%)	0·86 (0·69 to 1·08)	0·19
Composite kidney outcome 3	176 (11·6%)	216 (15·4%)	0·70 (0·57 to 0·86)	0·0005
Composite kidney outcome 4	260 (17·1%)	293 (20·9%)	0·79 (0·66 to 0·93)	0·0047
Primary MACE 3 outcome	321 (21·1%)	308 (22·0%)	0·94 (0·81 to 1·10)	0·46
Subcomponents				
Persistent macroalbuminuria	85 (5·6%)	89 (6·3%)	0·83 (0·62 to 1·12)	0·23
Persistent ≥40% reduction in eGFR	168 (11·1%)	207 (14·8%)	0·70 (0·57 to 0·85)	0·0005
Persistent ≥50% reduction in eGFR	93 (6·1%)	111 (7·9%)	0·73 (0·55 to 0·96)	0·024
Persistent doubling of serum creatinine level and creatinine clearance per eGFR <45 mL/min per 1·73 m²	48 (3·2%)	46 (3·3%)	0·92 (0·62 to 1·38)	0·69
End-stage kidney disease	53 (3·5%)	45 (3·2%)	1·04 (0·70 to 1·55)	0·84
Death from kidney disease	4 (0·3%)	5 (0·4%)	..	..
Death from cardiovascular disease	168 (11·1%)	179 (12·8%)	0·84 (0·68 to 1·04)	0·11
Additional kidney outcomes				
Annual rate of change in eGFR (slope), mL/min per 1·73 m², mean (SE)	−1·79 (0·10)	−2·72 (0·11)	..	<0·0001
Percentage change in UACR at 36 months, estimate (SE)	−47·51% (2·54)	−32·09% (3·80)	..	0·0004

6. Tirzepatide reduces the risk of hard kidney outcomes

Composite kidney outcome 2: defined as persistent macroalbuminuria, 2x serum creatinine and eGFR <45 mL/min per 1·73 m², ESKD or death from kidney disease

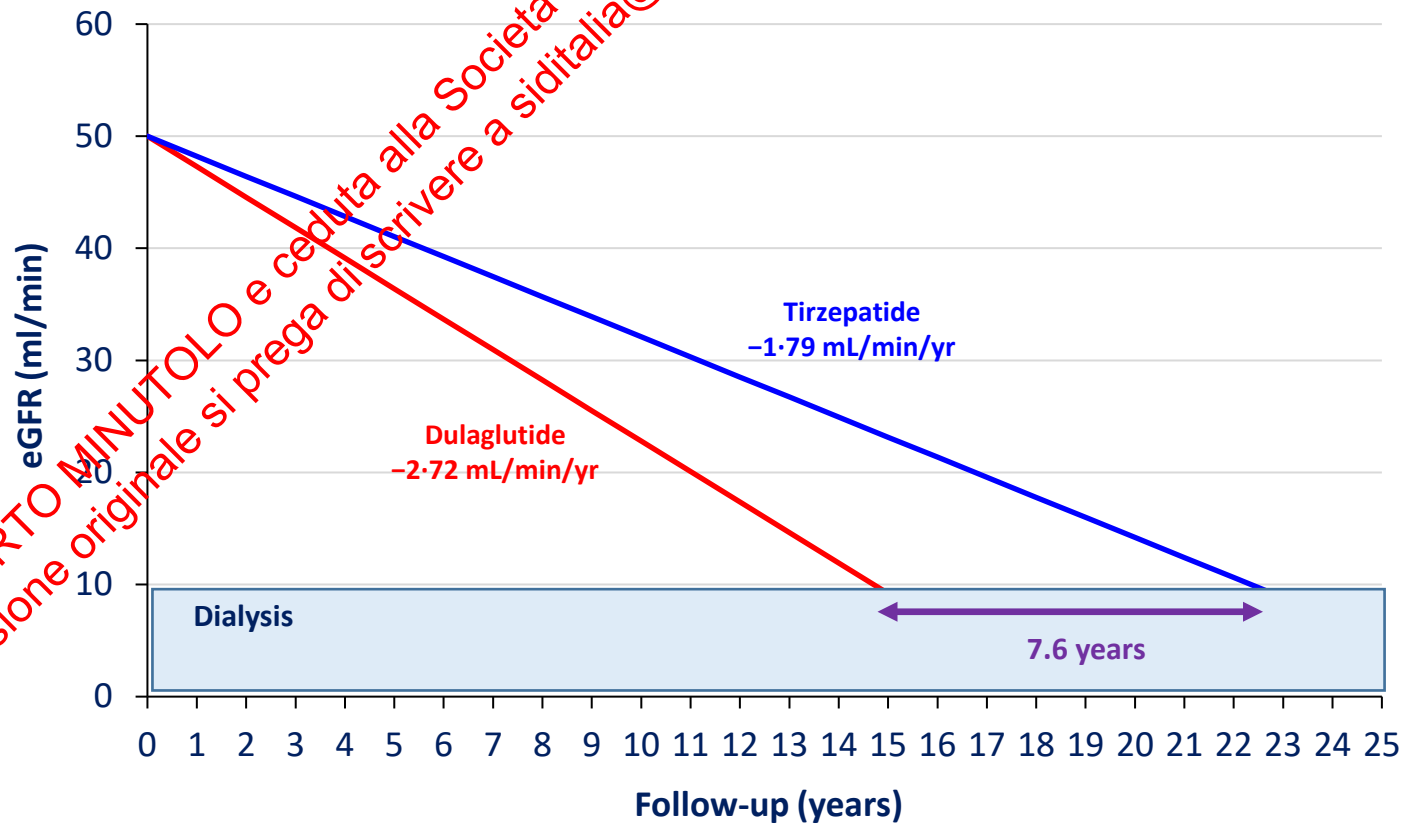
Composite kidney outcome 3: defined as persistent reduction in eGFR ≥40%, ESKD or death from kidney disease

Composite kidney outcome 4: defined as persistent reduction in eGFR ≥50%, ESKD or death from kidney disease

Lancet Diabetes Endocrinol 2026;

Tirzepatide reduces worsening of eGFR overtime: time to dialysis
(estimated from post-hoc analysis of SURPASS-CVOT trial)

Drug	Annual eGFR decline (vs placebo)
Tirzepatide[1]	0.93 (0.65 to 1.22)
Semaglutide[2]	0.94 (0.62 to 1.26)
Dapagliflozin[3]	0.93 (0.61 to 1.25)
Empagliflozin[4]	0.75 (0.54 to 0.96)
Finerenone[5]	0.84 (0.02- to 1.67



Data from Zoungas Lancet Diabetes Endocrinol 2026;14: 544–57

1. Zoungas Lancet Diabetes Endocrinol 2026;14: 544–57
2. Perkovic N Engl J Med 2024;391:109-21.
3. Heerspink N Engl J Med 2020;383:1436-46..
4. EMPA-KIDNEY N Engl J Med. 2023;388:117-127.
5. Sarafidis CJASN 2023;18: 602–612