# M. M. ♂, 53 y

Territorio

- **Anamnesi familiare:**
  - Non familiarità per malattie renali.
  - Familiarità per malattie cardiovascolari (padre deceduto per IMA)

- **Anamnesi fisiologica:**
  - Nato pre-termine

- **Anamnesi patologica remota:**
  - Ex abitudine tabagica (ca 30 sigarette al giorno per 20 anni).
  - Ipertensione arteriosa dall'età di 38 anni.
  - Dislipidemia.
  - Insufficienza cardiaca a frazione d'eiezione preservata (FE 58%) in quadro di cardiopatia ipertrofica su base ipertensiva.

# M. M. ♂, 53 y

Territorio

- **Anamnesi nefrologica:**
  - Riferito ricovero in età infantile per **macroematuria** in ambiente internistico. Non alterazione della funzione renale. Dimesso con diagnosi di cistite senza documentazione di urinocultura positiva.
  - Età 45 anni: **prima documentazione** di alterazione della funzione renale durante gli screening della Medicina del Lavoro (**sCr 1.3 mg/dL**). Non avviato follow-up nefrologico.
  - Età 51 anni: riscontro da parte del **MMG** di creatinina di 1,6 mg/dl e albuminuria 50 mg/dL.

Richieste indagini di II livello e valutazione Nefrologica.

M. M. ♂, 53 y

# PRESENTAZIONE CLINICA

Nefrologia

**Esami di laboratorio:**

- No anemia, non diabete, non disturbi elettrolitici
- sCr 1.75 mg/dL, eGFR 46 ml/min, UACR 980 mg/g (proteinuria 1247 mg/24h)
- LDL 145 mg/dL,
- NT-proBNP 985 pg/mL (vn <120 pg/mL)
- Non microematuria/emoglobinuria

**Ecografia addominale:**

Rene DX 9.2 cm. Rene SN 9.1 cm.

**Esame Obiettivo:**

- BMI 29 kg/m2
- PA 145/85 mmHg,
- Non edemi declivi

**Terapia in corso:**

Ramipril 5 mg 1 cp, Lasix 25 mg 1 cp x2, Amlodipina 5 mg 1 cp, Atorvastatina 20 mg 1 cp,

M. M. ♂, 53 y

# Come inquadriamo questo paziente?

BIOPSIA RENALE ?

SI

Importante fare diagnosi perché rimangono aperte opzioni terapeutiche differenziate

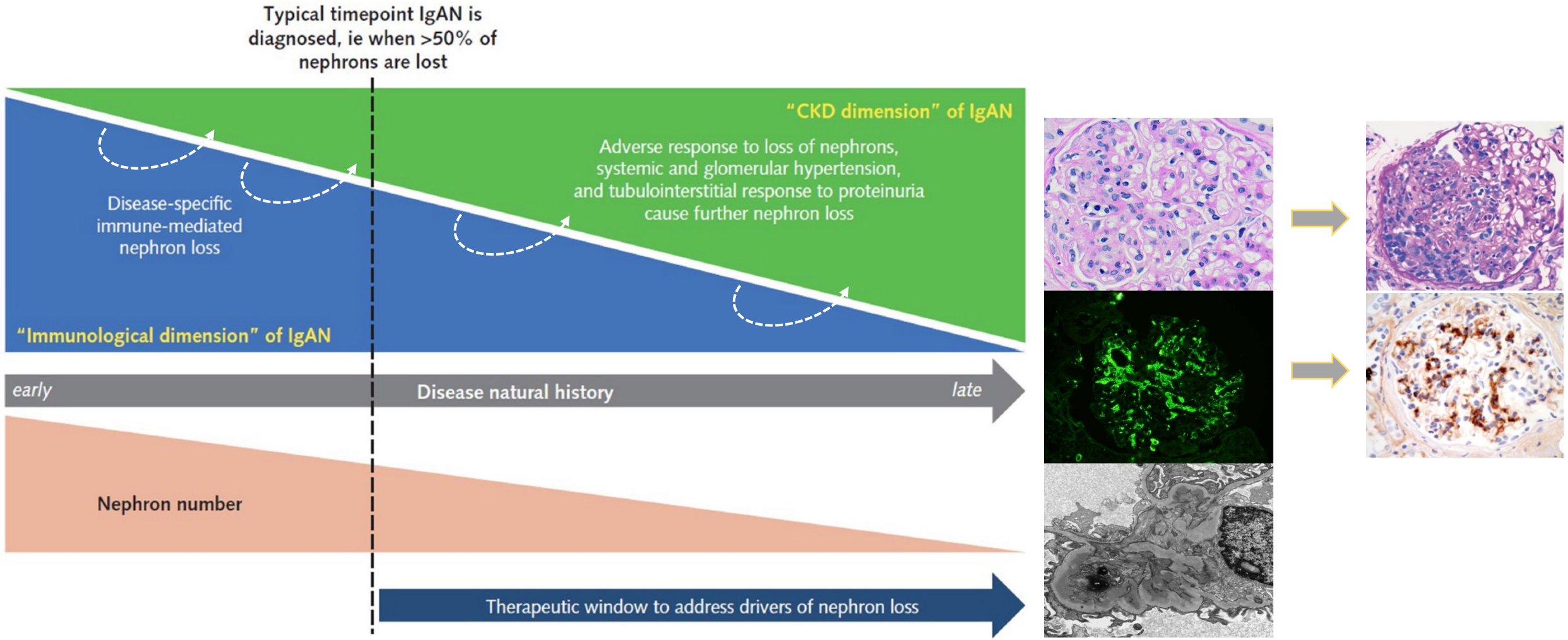
NO

Quadro troppo avanzato la biopsia non fornirebbe diagnosi certa

**Il paziente viene messo in lista per biopsia, ma convocato rifiuta il ricovero**

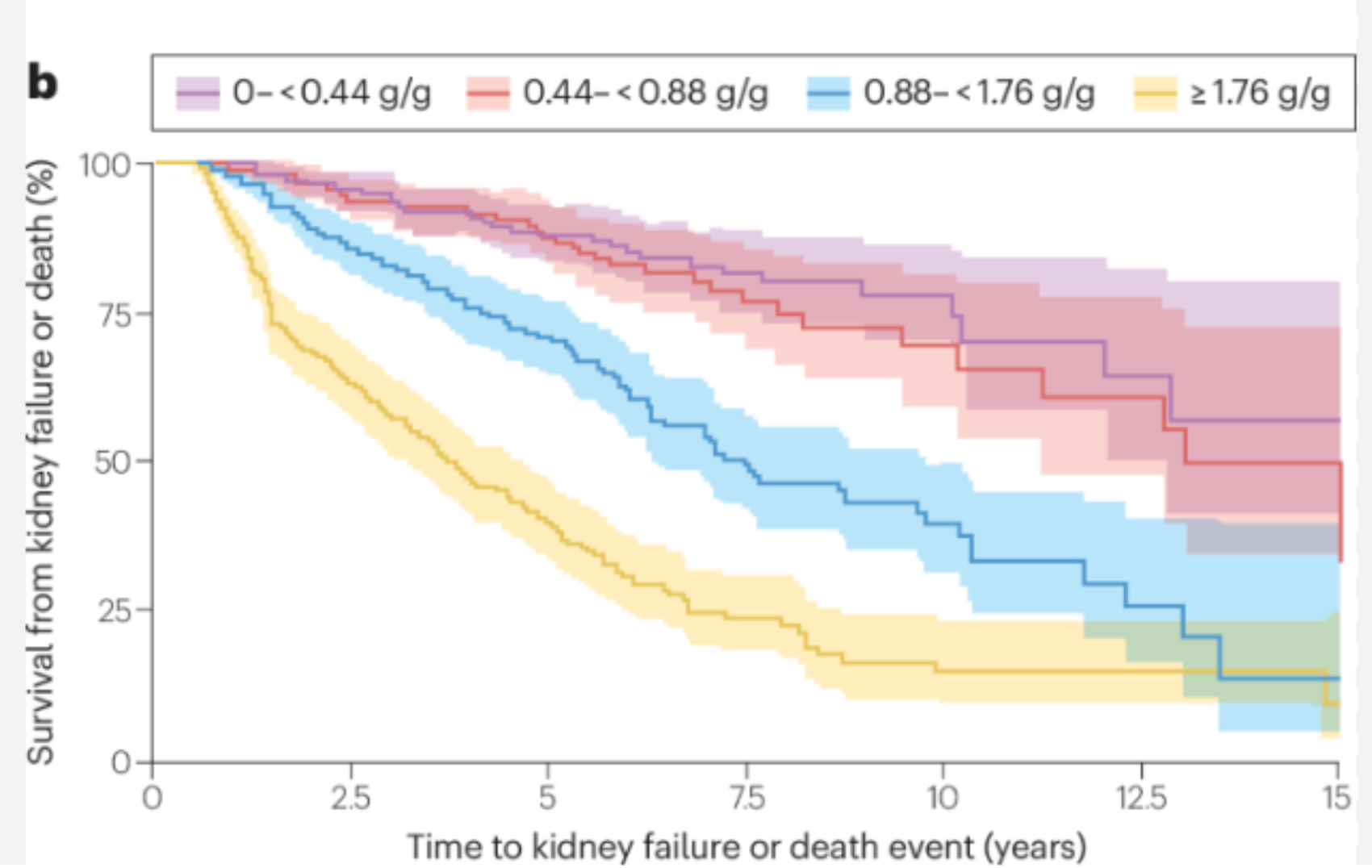
**DIAGNOSI DIFFERENZIALE**

1. IGAN/C3G
2. FSGS maladattiva
3. Nefroangiosclerosi da causa dismetabolica e ipertensiva
4. Stenosi dell'arteria renale
5. Altre nefropatie rare/genetiche



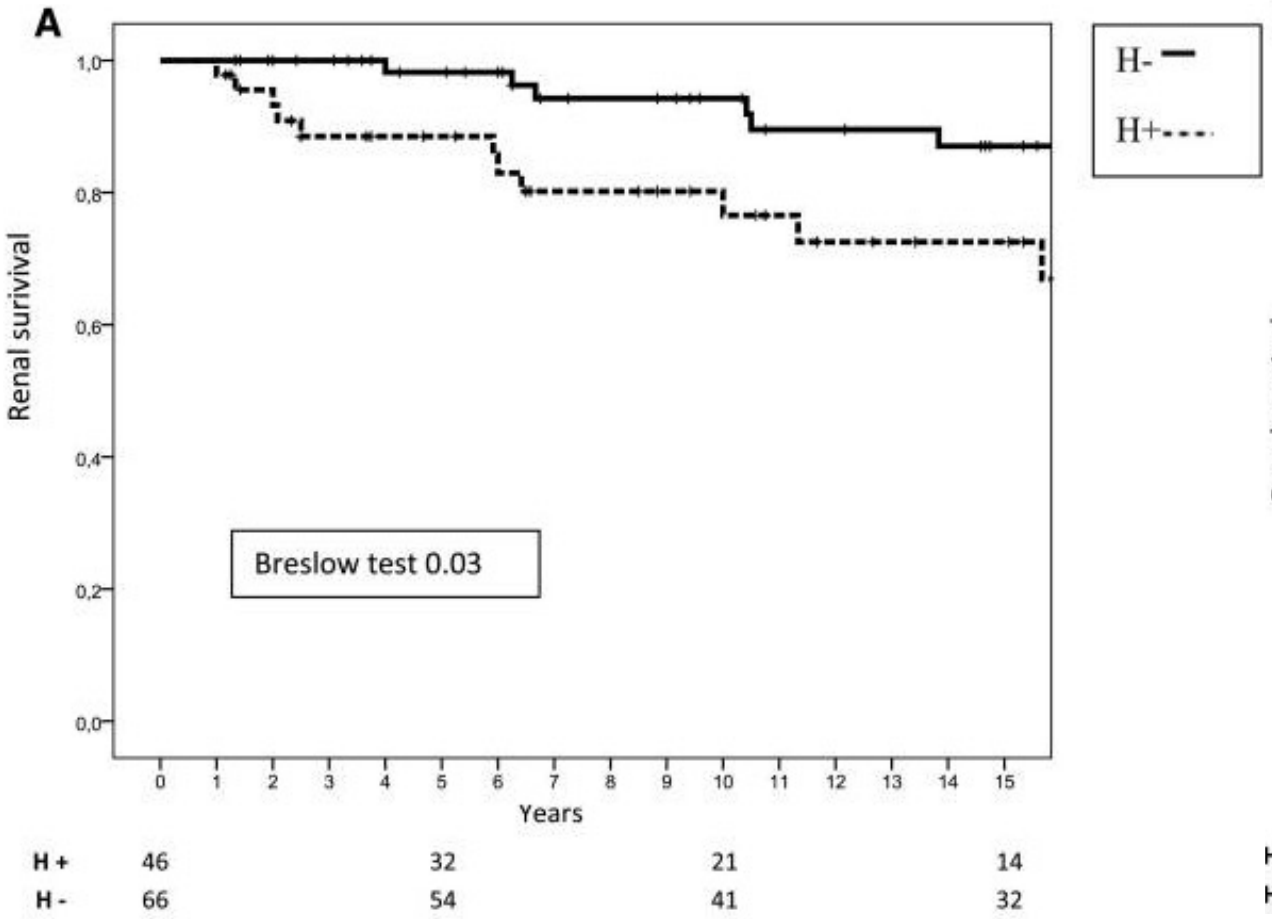

Barratt J et al., *Front. Med.* - 2024

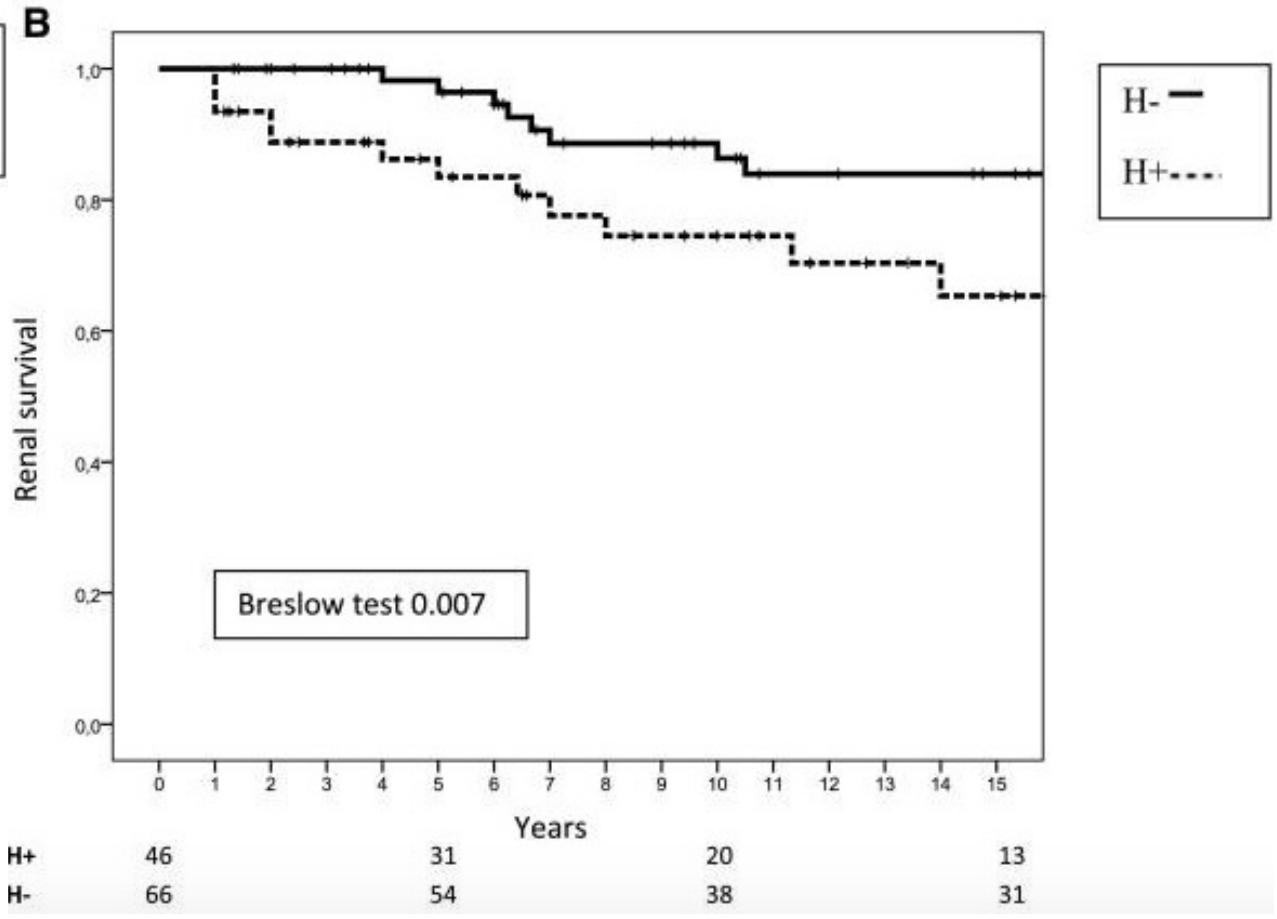
# Risk stratification: evaluation of clinical parameters → PROTEINURIA




Pitcher D et al, *CJASN* 2023

# Risk stratification: evaluation of clinical parameters → HAEMATURIA



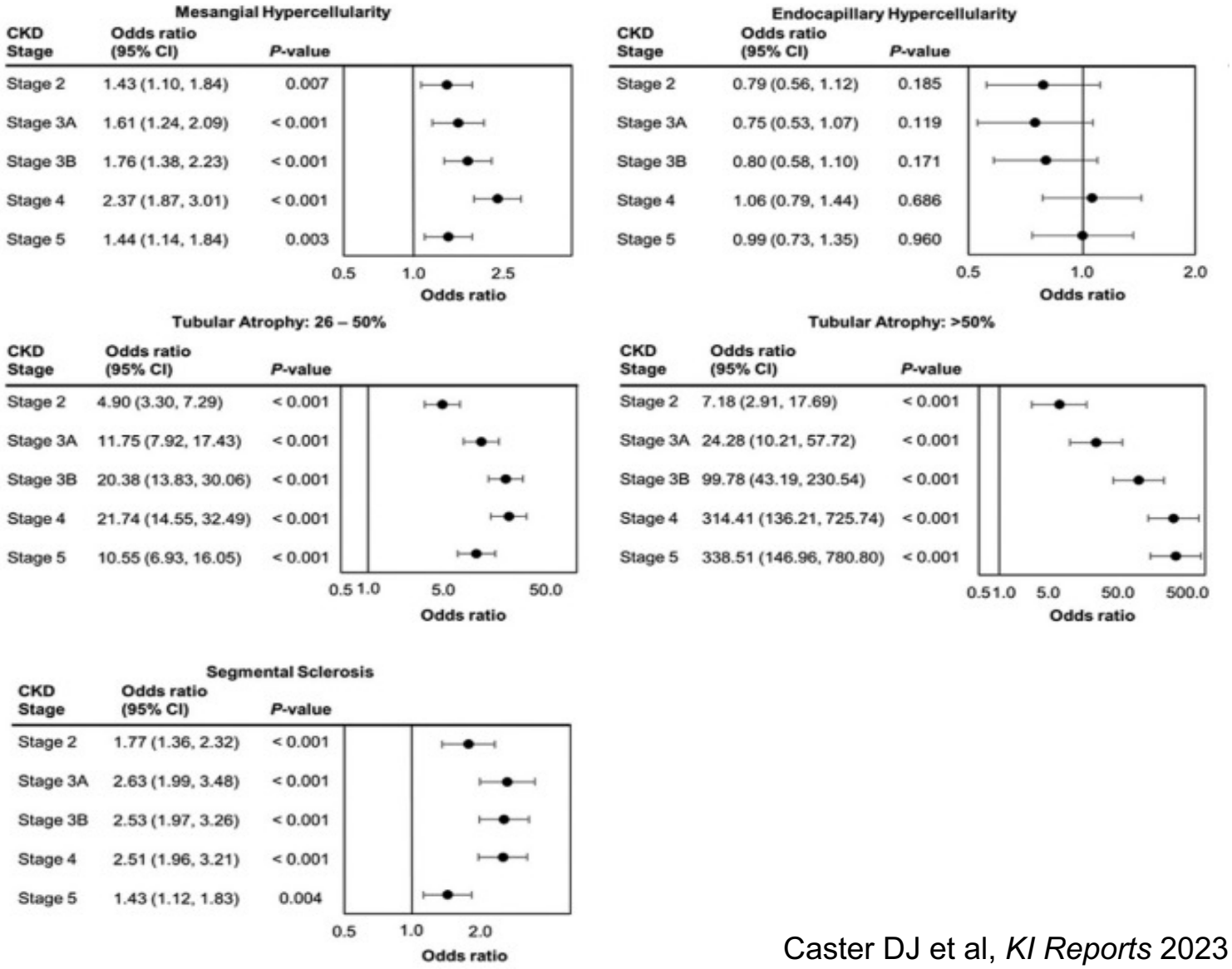

Sevillano AM et al, *JASN* 2017

# Il ritardo diagnostico nella IGAN

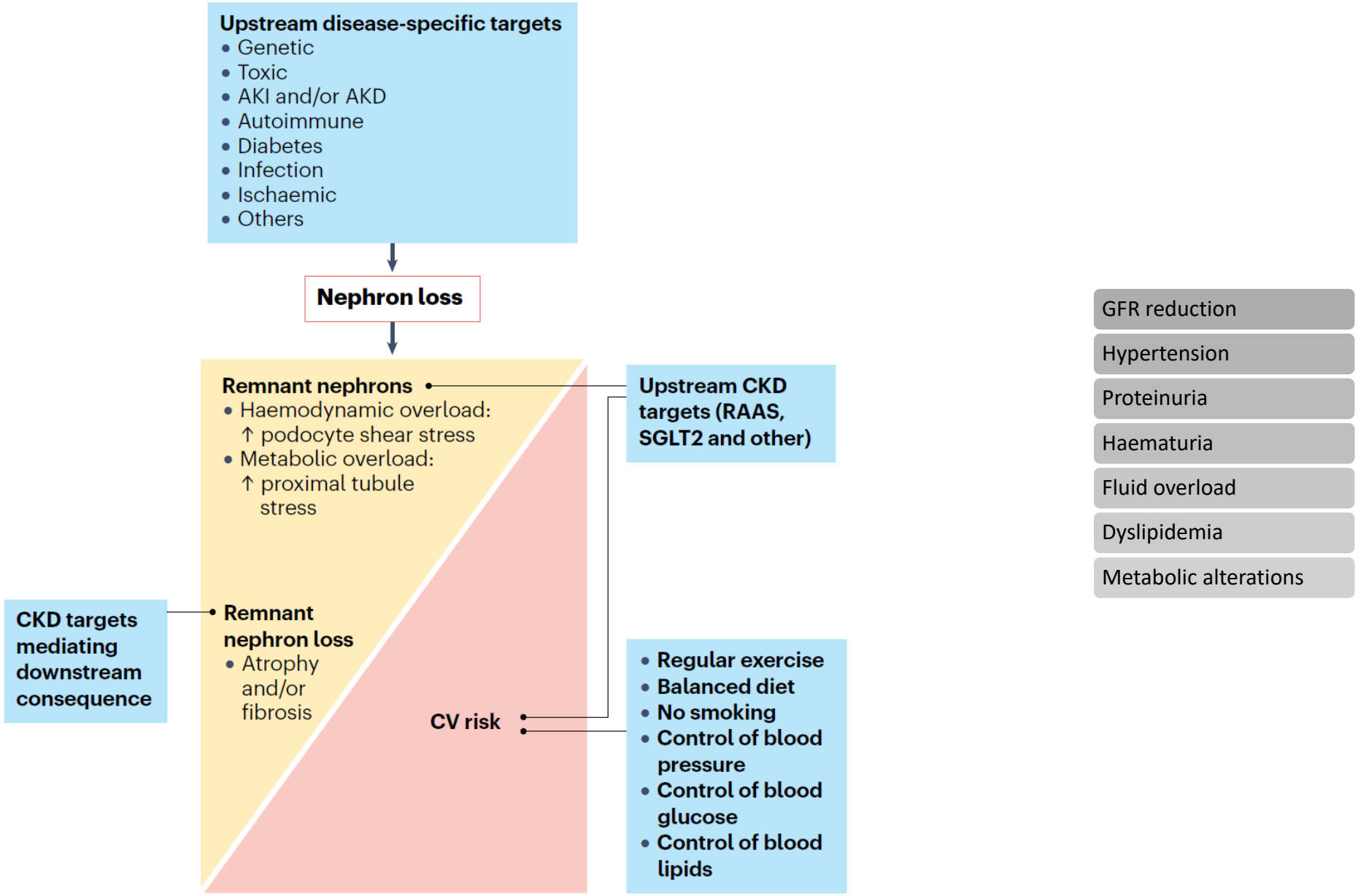
**The clinical characteristic of IgAN patients at diagnosis**

**Table 1.** Demographics and clinical characteristics

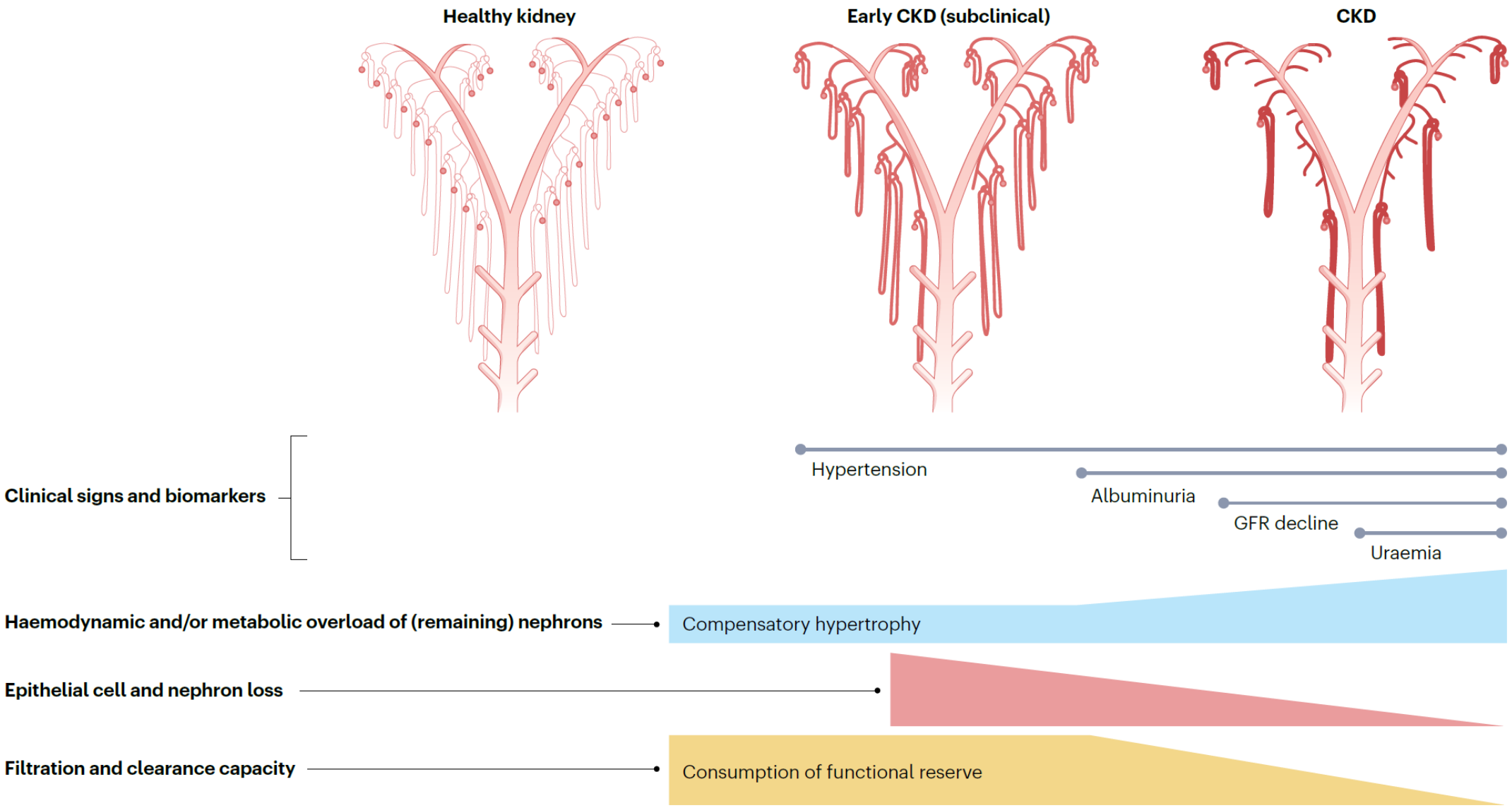
| Category | Frequency (N) | Percentage (%) |
|---|---|---|
| Overall | 4 375 | 100.0% |
| Age | | |
| Mean, yrs (SD) | 47.7 (16.6) | |
| Median, yrs (Q1, Q3) | 46 (34, 60) | |
| Sex | | |
| Male | 2742 | 62.7% |
| Race/Ethnicity | 2998 | 68.5% |
| Caucasian | 2172 | 72.4% (known race) |
| African American | 225 | 7.5% (known race) |
| Hispanic | 230 | 7.7% (known race) |
| Asian | 247 | 8.2% (known race) |
| Other | 124 | 4.1% (known race) |
| Unknown | 1377 | 31.5% |
| Hypertension | 3230 | 73.8% |
| Yes | 2852 | 88.3% |
| Hematuria | 2958 | 67.6% |
| Present | 2761 | 93.3% |
| Creatinine | 3828 | 87.5% |
| Mean, mg/dl (SD) | 3.0 (3.0) | |
| Median, mg/dl (Q1, Q3) | 2.0 (1.3, 3.4) | |
| eGFR[a] (ml/min/1.73 $m^2$) | 3828 | 87.5% |
| Mean (SD) | 44.2 (32.8) | |
| Median (Q1, Q3) | 35.3 (18.9, 60.6) | |
| CKD stage | 3828 | 87.5% |
| Stage 1 | 491 | 12.8% |
| Stage 2 | 481 | 12.6% |
| Stage 3 | 1250 | 32.7% |
| Stage 3A | 481 | 12.6% |
| Stage 3B | 769 | 20.1% |
| Stage 4 | 865 | 22.6% |
| Stage 5 | 741 | 19.4% |
| Proteinuria | 2280 | 52.1% |
| Mean, g/d (SD) | 4.2 (4.0) | |
| Median, g/d (Q1, Q3) | 3.0 (1.5, 5.8) | |
| ≥1 g/d | 1937 | 85.0% |
| ≥3.5 g/d | 1018 | 44.6% |




Caster DJ et al, *KI Reports* 2023



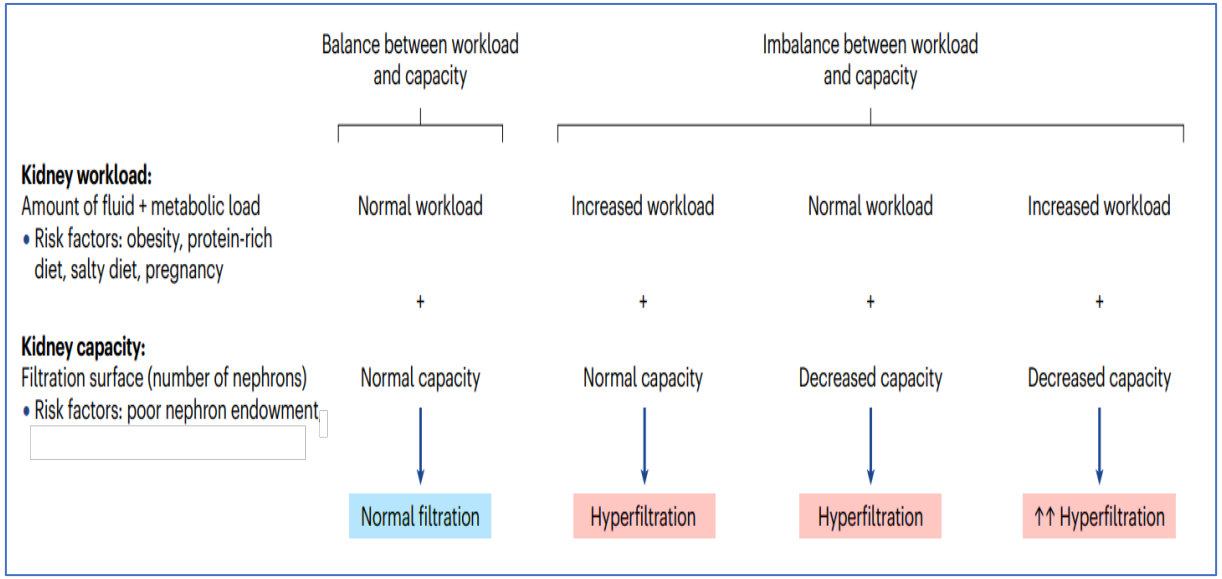

Romagnani P. et al., *Nat Rev Dis Primers* - 2025




Romagnani P. et al., *Nat Rev Dis Primers* - 2025

# CKD RISK FACTORS MANAGEMENT

| Non-modifiable risk factors | Check for |
|---|---|
| Nephron endowment | Low birthweight or preterm birth <36th week of gestation? |
| Previous kidney injuries | History of transiently reduced kidney function? |
| Advanced CKD | CKD stage G3–5 or A2–3 |
| Nephropathic gene variants | *APOL1*, *COL4*, *UMOD* (or any other of the known >300 nephropathic genes) |
| Old kidneys | >50 years of age |
| Male sex | N/A |




| | | | | |
|---|---|---|---|---|
| Sovraccarico renale | = | ↑ | = | ↑ |
| Capacità renale | = | = | ↓ | ↓ |

| Risk factors | Management |
|---|---|
| **Modifiable risk factors** | **Treatment target** |
| Salt intake | NaCl <5 g/day |
| Protein-rich diet | Protein ≤0.8 g/kg BW/day in CKD 3–5, avoid >1.3 g/kg BW/day |
| Healthy diet | Plant-based > animal-based food, minimize ultraprocessed food, reduce phosphate and potassium intake once necessary |
| Physical activity | Moderate intensity >150 min/week |
| Smoking | Quit |
| T2DM | T1D: HbA1c ≤7.5%, T2DM: 6.5–8.5% |
| Overweight or obesity | Reduce BMI below 25 |
| Arterial hypertension | SBP: 120 mmHg, if tolerated |
| Nephrotoxic agents | Use NSAID, PPI, aminoglycoside antibiotics, contrast media, only when benefits outweigh risk |
| ASCVD risk | Statin or statin/ezetimibe combination in patients >50 years of age with CKD |

Nature Reviews Rheumatology | Volume 20 | November 2024 | 699–711

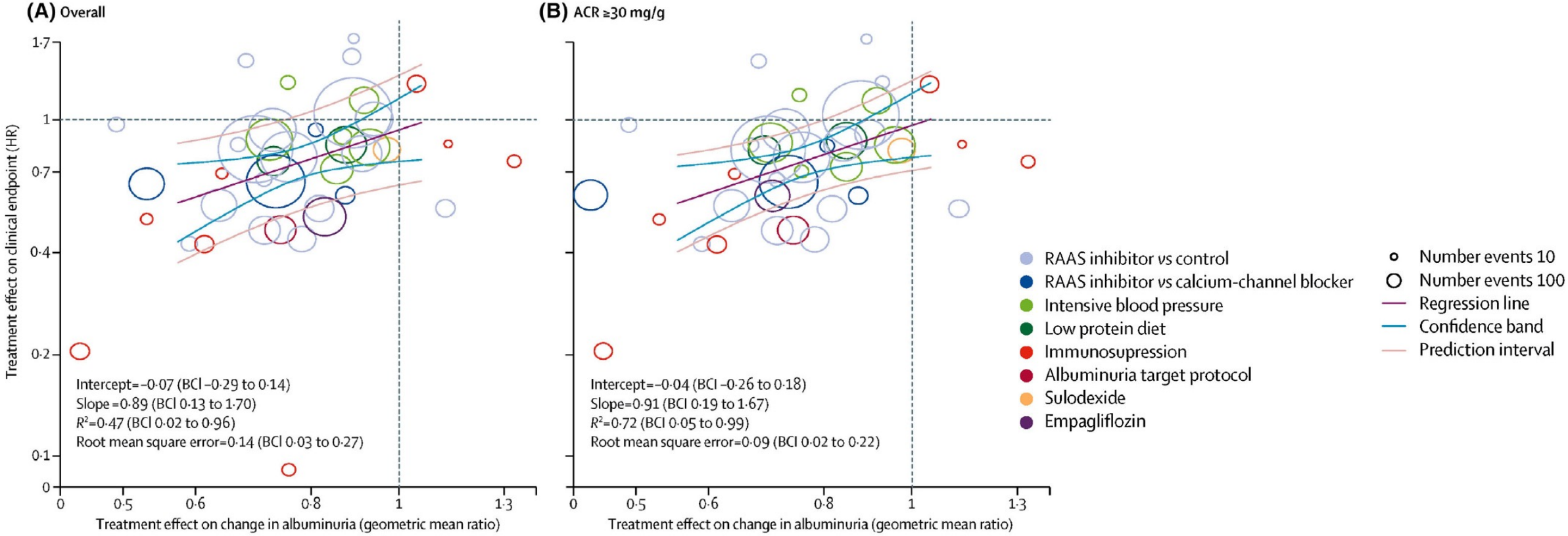
# Developments in albuminuria testing: A key biomarker for detection, prognosis and surveillance of kidney and cardiovascular disease—A practical update for clinicians

Jelle M. Beernink MD[1] | Dominique van Mil MD[1,2] | Gozewijn D. Laverman MD[3] | Hiddo J. L. Heerspink PhD[1] | Ron T. Gansevoort MD[2]

*Diabetes Obes Metab.* 2025;1–19.

Trial-level analyses for the association between **initial treatment effects on change in albuminuria and long-term treatment effects** on the clinical end-point for participants who had a baseline albumin-to-creatinine ratio (ACR) of more than 30 mg/g (171). The composite clinical end-point was the incidence of kidney failure, the doubling of serum creatinine concentration or eGFR of less than 15 mL/min per 1.73 m2.

**The coloured circles indicate different intervention types, and each circle represents a separate individual clinical trial**, with the size of the circle proportional to the number of events. The line of regression through the studies, Bayesian confidence bands and **Bayesian prediction bands from the model are shown**. The correlation with a **statistically significant slope indicates that larger early treatment effects on albuminuria are associated with larger treatment effects in reducing the risk of the clinical kidney end-point**. **These data support a role for albuminuria as a reasonably likely valid surrogate end-point in trials of CKD progression**.



M. M. ♂, 53 y (ACR 680 mg/g, 46 ml/mn)

**Score clinici**

- ❑ **KDIGO heat map:** CKD stadio G3a-A3
- ❑ **Kidney Failure Risk Equation (rischio di ESKD a 5 anni): 7.57%**

- ❑ **PREVENT (rischio di eventi CVD a 10 anni): 20.80% (high risk)**

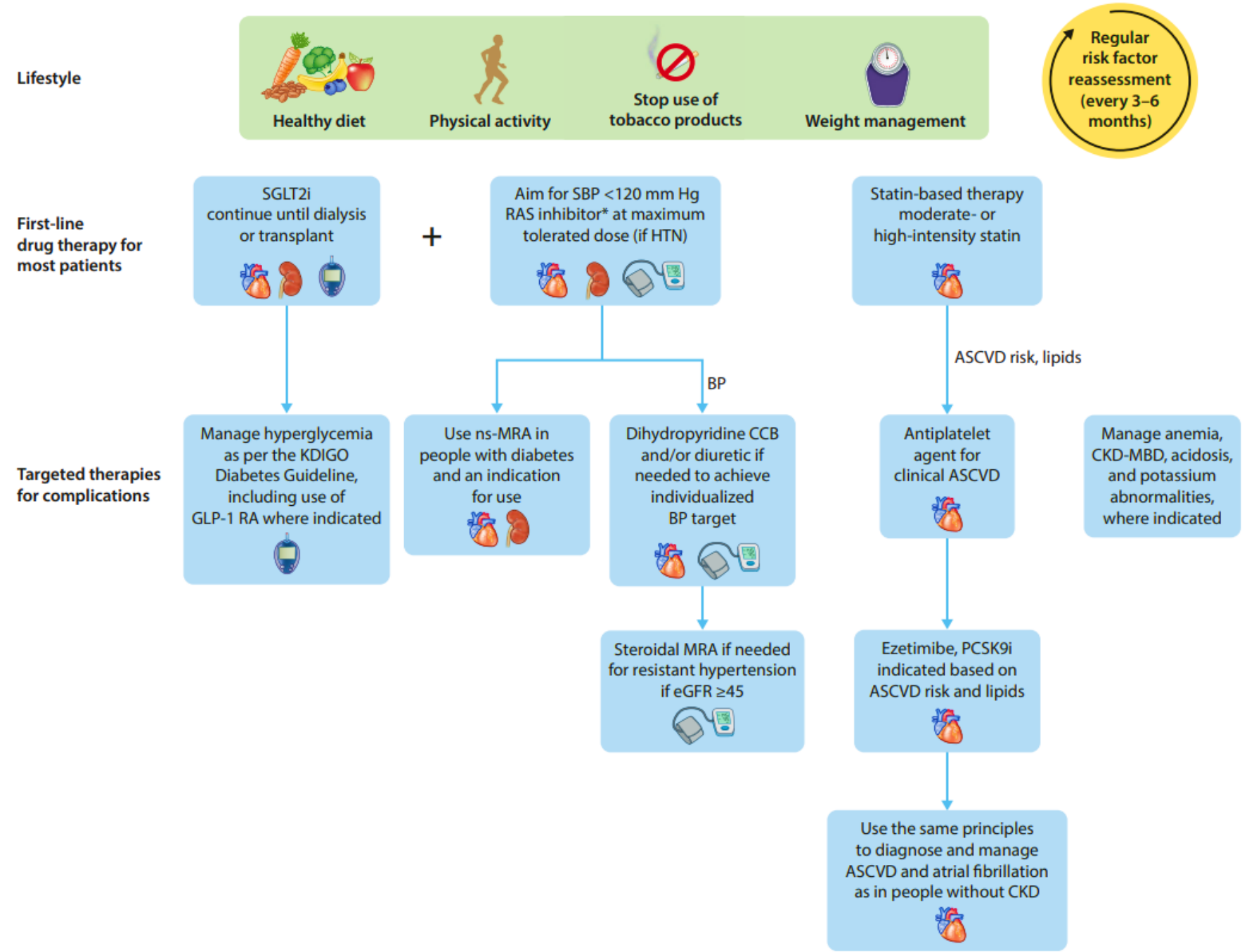
Guide to Frequency of Monitoring (number of times per year) by GFR and Albuminuria Category

| GFR categories (ml/min/1.73 m²) Description and range | | | | Persistent albuminuria categories Description and range | | |
|---|---|---|---|---|---|---|
| | | | | A1 | A2 | A3 |
| | | | | Normal to mildly increased | Moderately increased | Severely increased |
| | | | | <30 mg/g <3 mg/mmol | 30–300 mg/g 3–30 mg/mmol | >300 mg/g >30mg/mmol |
| | G1 | Normal or high | ≥90 | 1 if CKD | 1 | 2 |
| | G2 | Mildly decreased | 60–89 | 1 if CKD | 1 | 2 |
| | G3a | Mildly to moderately decreased | 45–59 | 1 | 2 | 3 |
| | G3b | Moderately to severely decreased | 30–44 | 2 | 3 | 3 |
| | G4 | Severely decreased | 15–29 | 3 | 3 | 4+ |
| | G5 | Kidney failure | <15 | 4+ | 4+ | 4+ |

Il **PREVENT™** per la stima del **rischio di eventi cardiovascolari**:

- infarto miocardico
- ictus
- insufficienza cardiaca
- mortalità cardiovascolare

| | | | |
|---|---|---|---|
| Model | Base | | |
| | uACR | 680 | |
| | HbA1c | | |
| | SDI | | |
| | Full | | |
| Sex | Female | Male | |
| Age | | | years |
| Total cholesterol | Norm: 150 - 200 | | mg/dL |
| HDL cholesterol | Norm: 20 - 60 | | mg/dL |
| SBP | Norm: 100 - 120 | | mm Hg |
| Diabetes | No | Yes | |
| Current smoker | No | Yes | |
| eGFR 1.75 | Norm: 90 - 120 | 46 | mL/min/1.73 m² |
| Using anti-hypertensive medication | No | Yes | |
| Using statins | No | Yes | |
| BMI | Norm: 20 - 25 | | kg/m² |
| uACR Indicated for those patients with chronic kidney disease, diabetes, or hypertension. | Norm: 0.1 - 30 | | mg/g |




KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease

# M. M. ♂, 53 y

Nefrologia

**Esami di laboratorio:**

- No anemia, non diabete, non disturbi elettrolitici
- sCr 1.75 mg/dL, eGFR 46 ml/min, Proteinuria 1247 mg/24h, UACR 980 mg/g
- LDL 145 mg/dL,
- NT-proBNP 985 pg/mL
- Sedimento urinario con albuminuria 100 mg/dL, non microematuria

**Terapia in corso:**

Ramipril 5 mg 1 cp, Lasix 25 mg 1 cp, Amlodipina 5 mg 1 cp, Atorvastatina 20 mg 1 cp,

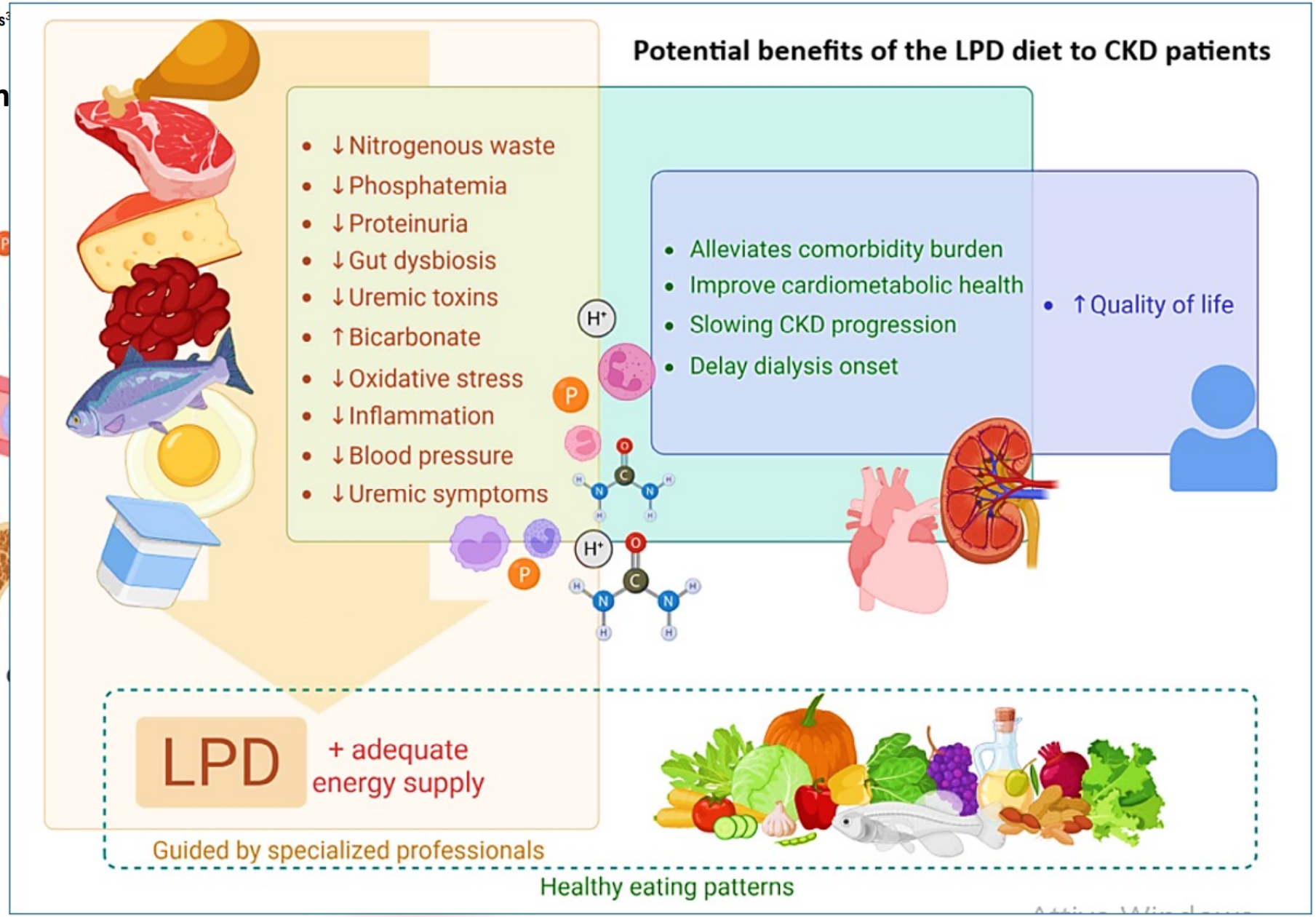
**Provvedimenti:**

- Aumenta Ramipril a 10 mg/die,
- Inizia **Dapagliflozin** 10 mg,
- **STOP Lasix**
- Potenzia **Atorvastatina a 40 mg/die**,
- Prescritta dieta ipocalorica, iposodica e moderatamente ipoproteica (0.7 g/kg)
- Indicato esercizio fisico e calo ponderale

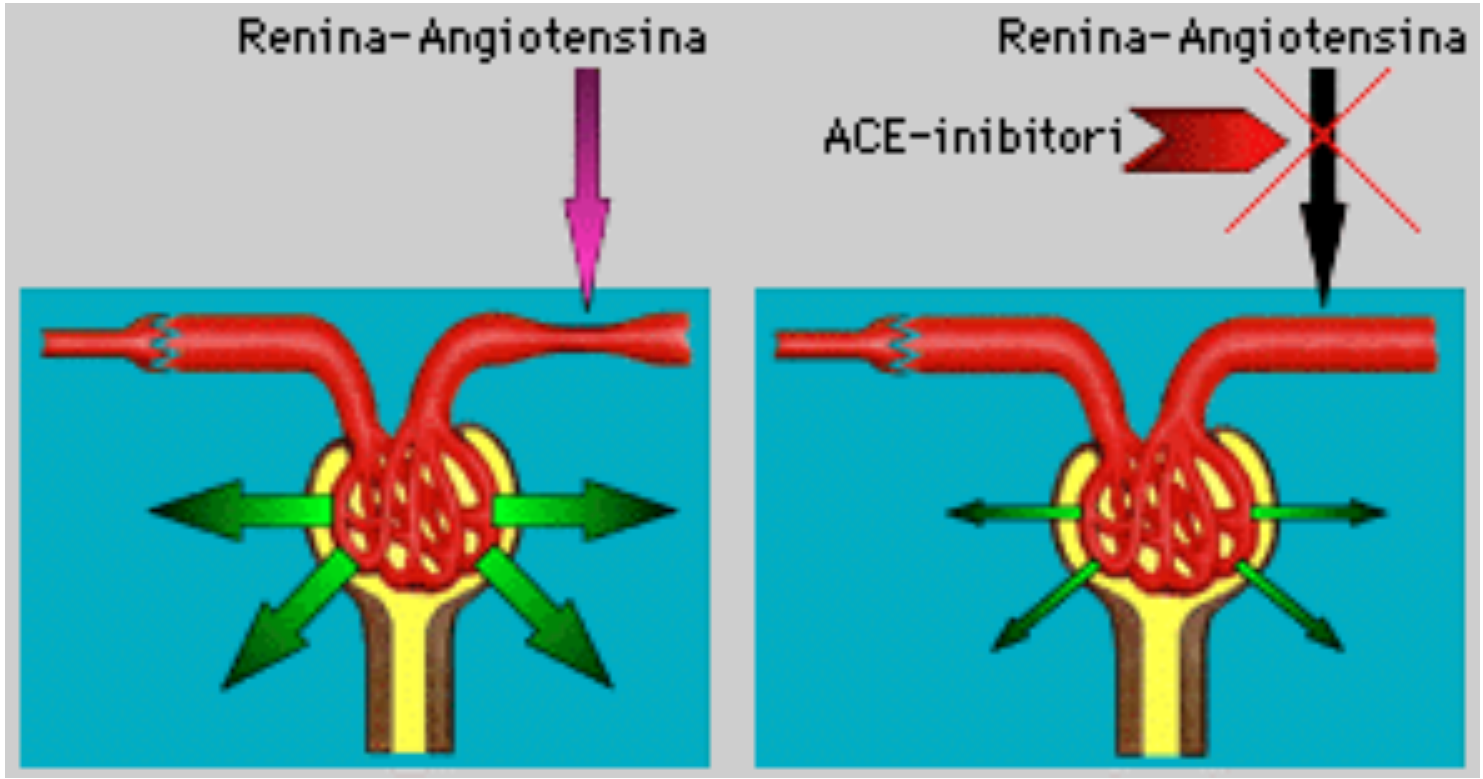
# Low-protein diet for chronic kidney disease: Evidence, controversies, and practical guidelines

Denise Mafra[1,2], Isabela Brum[2], Natália A. Borges[3]

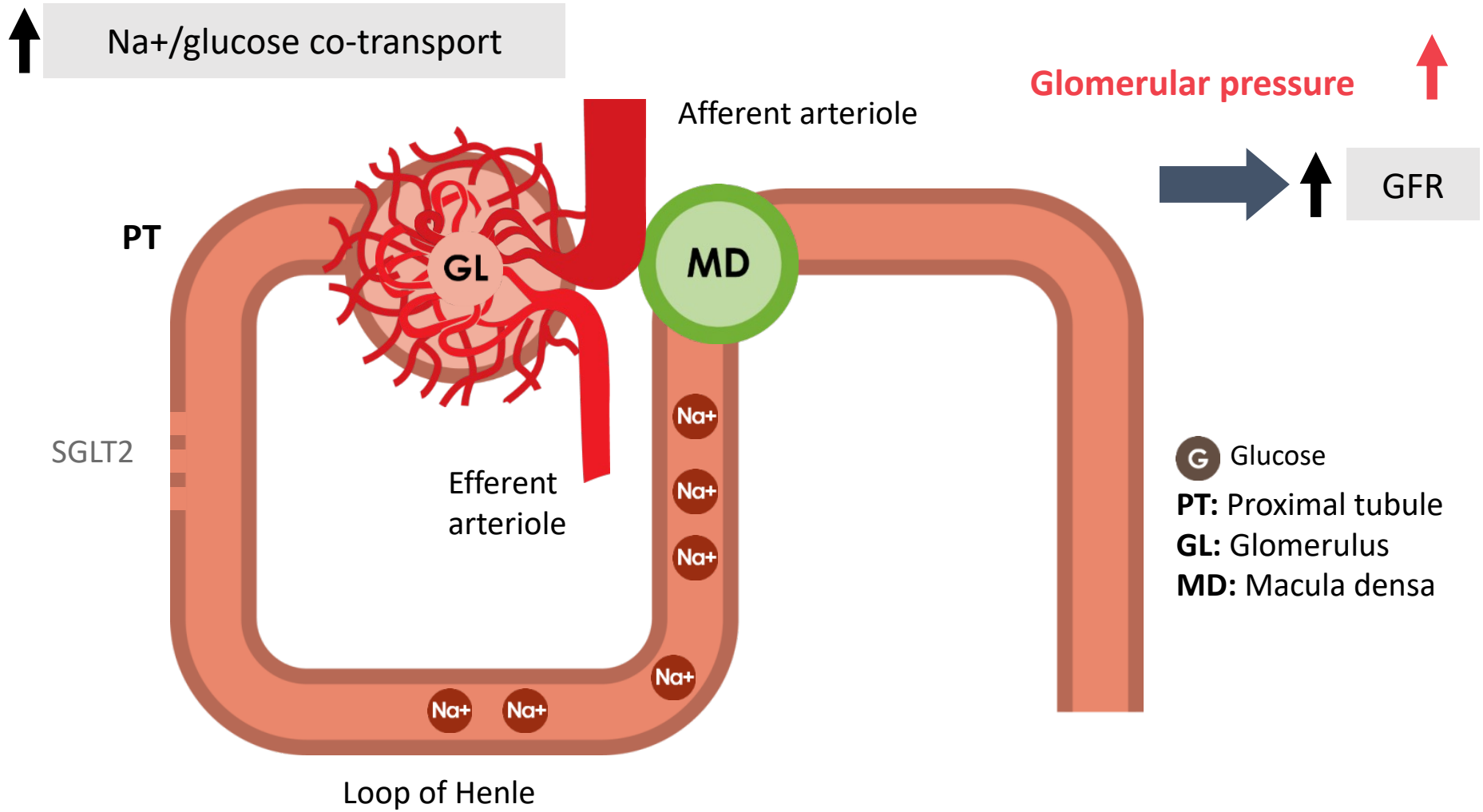
Journal of Internal Medicine, 2025, 298; 319–335



# Razionale della ACE-inibizione



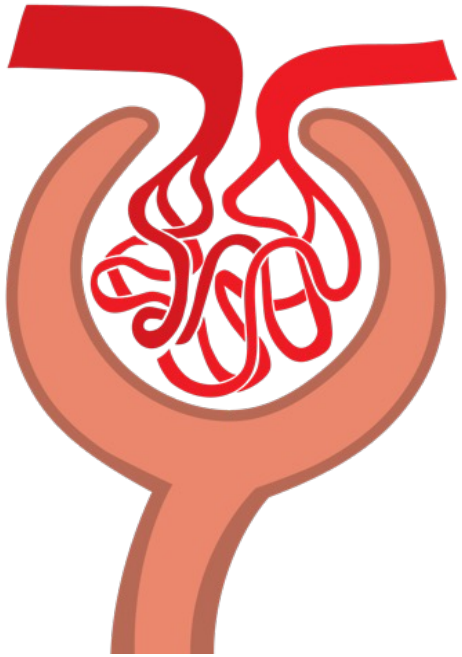
# Diabetes may cause glomerular hypertension




**Renal hemodynamics under hyperglycemia**

# Gliflozin exerts a hemodynamic effect within the kidney

- By restoring the Tubulo-Glomerular Feedback (TGF), gliflozin increases the afferent arteriole tone, thereby lowering glomerular hypertension

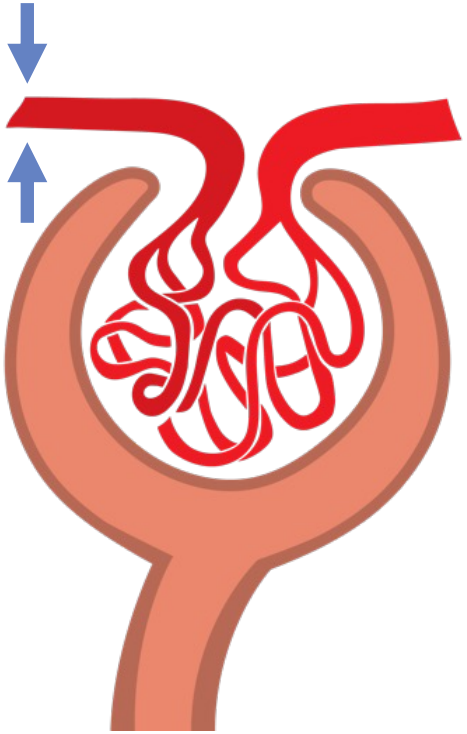


**Action:**

**SGLT2 inhibition**

**Afferent** arteriole narrowing

narrowing



**Clinical implications:**

- Glomerular pressure decreases
- Early clinical marker:
  - Initial dip in GFR
  - Reduction of albuminuria

# SGLT2 Inhibitors and Kidney Outcomes by and Albuminuria
## A Meta-Analysis

Brendon L. Neuen, PhD; Robert A. Fletcher, MSc; Stefan D. Anker, MD; Deepak L. Bhatt; David Z. I. Cherney, PhD; Kieran F. Docherty, PhD; Silvio E. Inzucchi, MD; Meg J. Jardine; Kenneth W. Mahaffey, MD; Finnian R. McCausland, MD; Darren K. McGuire, MD; John J. Bruce Neal, PhD; Milton Packer, MD; Siddharth M. Patel, MD; Vlado Perkovic, PhD; Mar Rebecca J. Sardell, PhD; Scott D. Solomon, MD; Muthiah Vaduganathan, MD; Christoph David C. Wheeler, MD; Faiez Zannad, MD; Richard Haynes, DM; Natalie Staplin, PhD; W Hiddo J. L. Heerspink, PhD; for the SGLT2 Inhibitor Meta-Analysis Cardio-Renal Trialists

lished online November 7, 2025

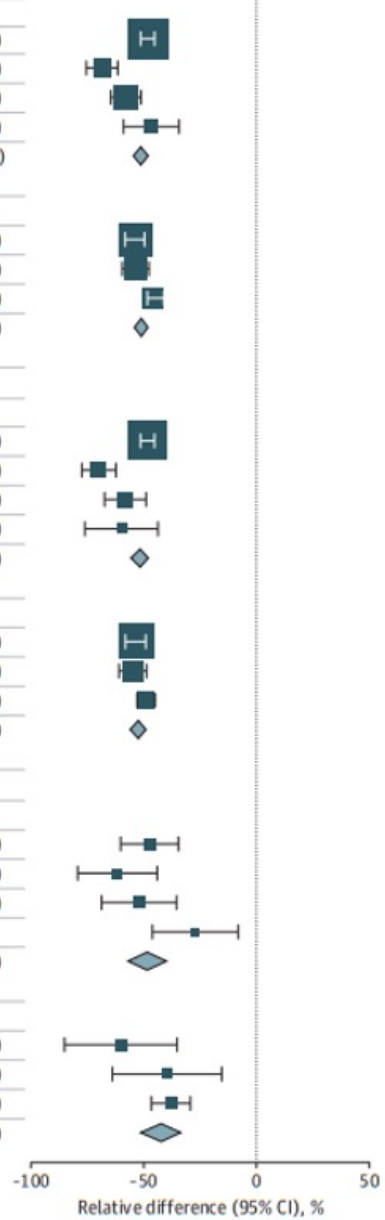
**n 10 randomized,**

**Ou** **ilure**

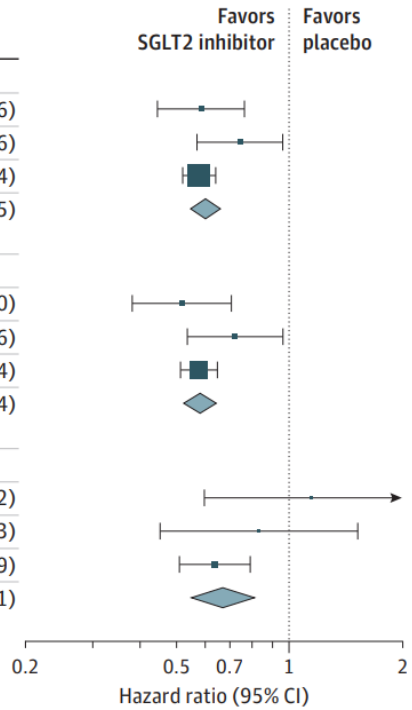
| Baseline estimated GFR, mL/min/1.73 m² | No. of participants/total: SGLT2 inhibitor | Plac |
|---|---|---|
| All participants | | |
| ≥60 | 271/23 164 (1.2) | 369/ |
| 45 to <60 | 164/6255 (2.6) | 273/ |
| 30 to <45 | 274/5561 (4.9) | 389/ |
| <30 | 241/1928 (12.5) | 333/ |
| Overall | 950/36 911 (2.6) | 1364 |
| Trend by baseline estimated GFR: *P* = .16 | | |
| Participants with diabetes | | |
| ≥60 | 246/19 861 (1.2) | 335/ |
| 45 to <60 | 137/4355 (3.1) | 226/ |
| 30 to <45 | 213/3586 (5.9) | 306/ |
| <30 | 139/1122 (12.4) | 199/ |
| Overall | 735/28 940 (2.5) | 1066 |
| Trend by baseline estimated GFR: *P* = .39 | | |
| Participants without diabetes | | |
| ≥60 | 25/3303 (0.8) | 34/3 |
| 45 to <60 | 27/1900 (1.4) | 47/1 |
| 30 to <45 | 61/1975 (3.1) | 83/1 |
| <30 | 102/788 (12.9) | 134/ |
| Overall | 215/7971 (2.7) | 298/ |
| Trend by baseline estimated GFR: *P* = .57 | | |

## eGFR SLOPE

| | Mean (SE) estimated GFR slope, mL/min/1.73 m²/y: SGLT2 inhibitor | Placebo | Relative difference (95% CI), % |
|---|---|---|---|
| All participants | | | |
| Estimated GFR, mL/min/1.73 m² | | | |
| ≥60 | -1.25 (0.04) | -2.41 (0.04) | -48 (-51 to -45) |
| 45 to <60 | -0.84 (0.09) | -2.64 (0.09) | -68 (-75 to -61) |
| 30 to <45 | -0.87 (0.10) | -2.43 (0.10) | -57 (-65 to -49) |
| <30 | -1.38 (0.16) | -2.59 (0.16) | -47 (-59 to -34) |
| Overall | -1.17 (0.03) | -2.45 (0.03) | -51 (-54 to -49) |
| Trend by baseline estimated GFR: *P* = .02 | | | |
| UACR, mg/g | | | |
| <30 | -0.84 (0.04) | -1.83 (0.04) | -54 (-58 to -50) |
| 30 to 300 | -1.08 (0.07) | -2.33 (0.07) | -54 (-59 to -48) |
| >300 | -2.69 (0.08) | -4.96 (0.08) | -46 (-49 to -43) |
| Overall | -1.20 (0.03) | -2.45 (0.03) | -51 (-54 to -49) |
| Trend by baseline UACR: *P* = .002 | | | |
| Participants with diabetes | | | |
| Estimated GFR, mL/min/1.73 m² | | | |
| ≥60 | -1.24 (0.04) | -2.40 (0.04) | -48 (-51 to -45) |
| 45 to <60 | -0.82 (0.11) | -2.73 (0.11) | -70 (-77 to -62) |
| 30 to <45 | -0.81 (0.12) | -2.59 (0.12) | -58 (-67 to -49) |
| <30 | -1.04 (0.22) | -2.61 (0.22) | -60 (-76 to -44) |
| Overall | -1.16 (0.03) | -2.45 (0.03) | -52 (-54 to -49) |
| Trend by baseline estimated GFR: *P* < .001 | | | |
| UACR, mg/g | | | |
| <30 | -0.86 (0.04) | -1.85 (0.04) | -53 (-58 to -49) |
| 30 to 300 | -1.08 (0.07) | -2.38 (0.07) | -55 (-61 to -49) |
| >300 | -2.70 (0.09) | -5.30 (0.09) | -49 (-53 to -46) |
| Overall | -1.14 (0.03) | -2.41 (0.03) | -53 (-55 to -50) |
| Trend by baseline UACR: *P* = .11 | | | |
| Participants without diabetes | | | |
| Estimated GFR, mL/min/1.73 m² | | | |
| ≥60 | -1.43 (0.18) | -2.71 (0.18) | -48 (-60 to -35) |
| 45 to <60 | -0.89 (0.21) | -2.31 (0.21) | -62 (-79 to -44) |
| 30 to <45 | -0.99 (0.18) | -2.08 (0.18) | -52 (-69 to -36) |
| <30 | -1.87 (0.25) | -2.57 (0.25) | -27 (-46 to -8) |
| Overall | -1.24 (0.10) | -2.40 (0.10) | -48 (-57 to -40) |
| Trend by baseline estimated GFR: *P* = .19 | | | |
| UACR, mg/g | | | |
| ≤30 | -0.63 (0.20) | -1.60 (0.20) | -60 (-85 to -35) |
| 30 to 300 | -1.09 (0.22) | -1.81 (0.22) | -40 (-64 to -15) |
| >300 | -2.29 (0.16) | -3.70 (0.16) | -38 (-47 to -29) |
| Overall | -1.51 (0.11) | -2.62 (0.11) | -42 (-51 to -34) |
| Trend by baseline UACR: *P* = .13 | | | |




rd ratio
% CI)
(0.44-0.76)
(0.57-0.96)
(0.52-0.64)
(0.55-0.65)
(0.38-0.70)
(0.53-0.96)
(0.51-0.64)
(0.52-0.64)
(0.59-2.22)
(0.45-1.53)
(0.51-0.79)
(0.55-0.81)



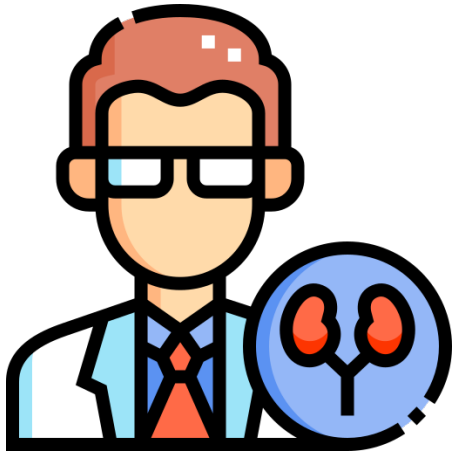
M. M. ♂, 53 y

## ...1 MESE DOPO

Nefrologia

**Esami di laboratorio:**

- **sCr 1.90 mg/dL, eGFR 42 ml/min (-8,5%), UACR 580 mg/g (-41%)**
- Na 141 mmol/L, K 4.6 mmol/L
- **LDL 110 mg/dL (-34%)**
- **NT-proBNP 658 pg/mL (-36%)**



**Esame obiettivo:**

- **BMI 28 kg/m2 (-3,5%)**
- **PA 135/80 mmHg**.

**Note:**

Riferisce miglioramento della cenestesi globale. Terapia ben tollerata.

**Terapia in corso:**

Ramipril 5 mg 1 cp, Dapagliflozin 10 mg, Amlodipina 5 mg 1 cp, Atorvastatina 40 mg 1 cp, Colecalciferolo 10.000U/ml 5 gtt

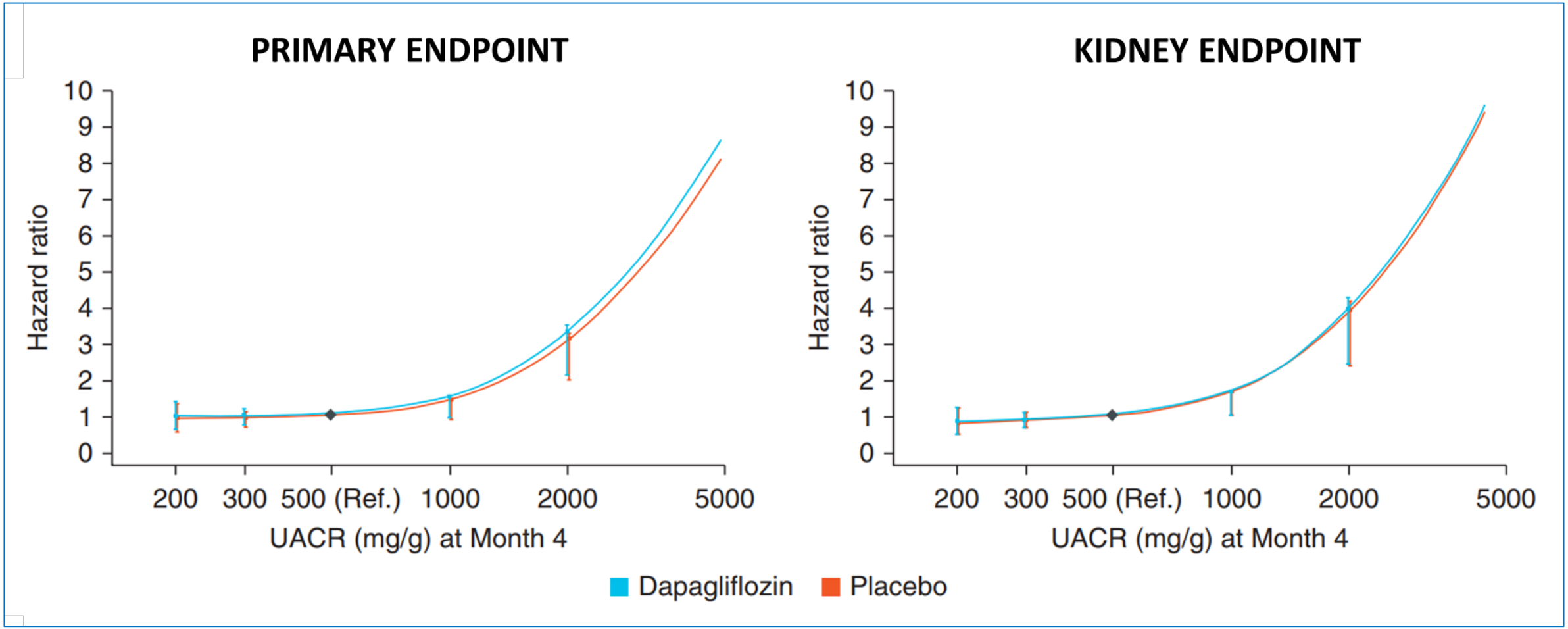
**Risultato terapeutico è ottimale? Risultato ottenuto?**

# Baseline, Early Changes, and Residual Albuminuria

## *Post Hoc* Analysis of a Randomized Clinical Trial of Dapagliflozin in Chronic Kidney Disease

*Dominique van Mil*[1,2] *Priya Vart*[1,2] *Glenn M. Chertow*[3] *Ron T. Gansevoort*[2] *Peter Rossing*[4,5] *Robert D. Toto*[6] *Ricardo Correa-Rotter*[7] *Anna Maria Langkilde*[8] *C. David Sjöström*[8] *David C. Wheeler*[9] *and Hiddo J.L. Heerspink*[1,10]

CJASN 19: 1574–1584, December, 2024



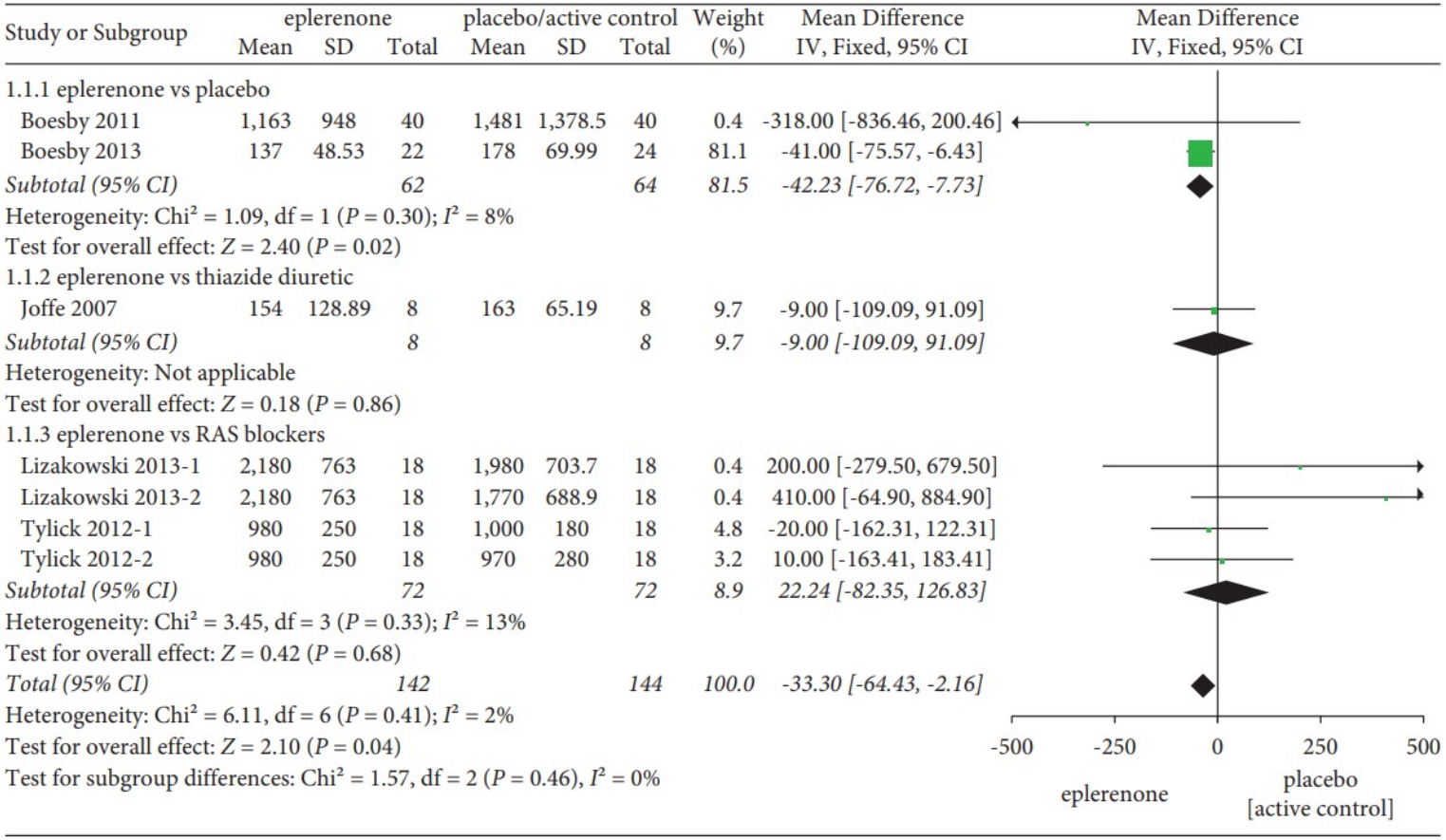
# Efficacy and Safety of Eplerenone for Treating Chronic Kidney Disease: A Meta-Analysis

International Journal of Hypertension
Volume 2023, Article ID 6683987, 18 pages

Honglei Hu,[1] Mengdie Cao,[2] Yao Sun,[1] Xingqian Jin,[1] Xiaodong Zhao,[1] and Xiangguo Cong[2]

19 RCTs with a total of 4501 subjects

**Eplerenone reduced proteinuria by –42.2% and albuminuria by -23.5%**



# Aldosterone in chronic kidney disease and renal outcomes

**Ashish Verma [1]*, Anand Vaidya [2], Sonu Subudhi [3], and Sushrut S. Waikar [1]**

European Heart Journal (2022) **43**, 3781–3791

The CRIC study is a multicentre, prospective, observational cohort study designed to investigate the risk factors for death, cardiovascular disease, and CKD progression in participants with known CKD.[16] From 8 April 2003, through 3 September 2008 (Phase 1), 3939 participants, 21–74 years old, were enrolled across seven clinical centres in the USA, with an estimated glomerular filtration rate (eGFR) ranging from 20 to 70 mL/min/1.73 $m^2$.[17] Exclusion criteria for this cohort were: inability

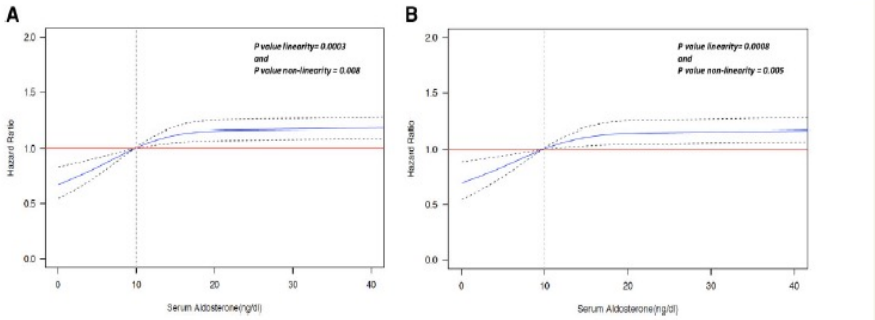



**Figure 3** Association of serum aldosterone with chronic kidney disease progression (50% estimated glomerular filtration rate decline or end-stage kidney disease) (Panel A) and end-stage kidney disease (Panel B).

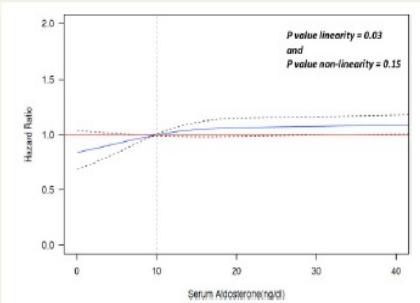



**Figure 4** Association of serum aldosterone with all-cause mortality.

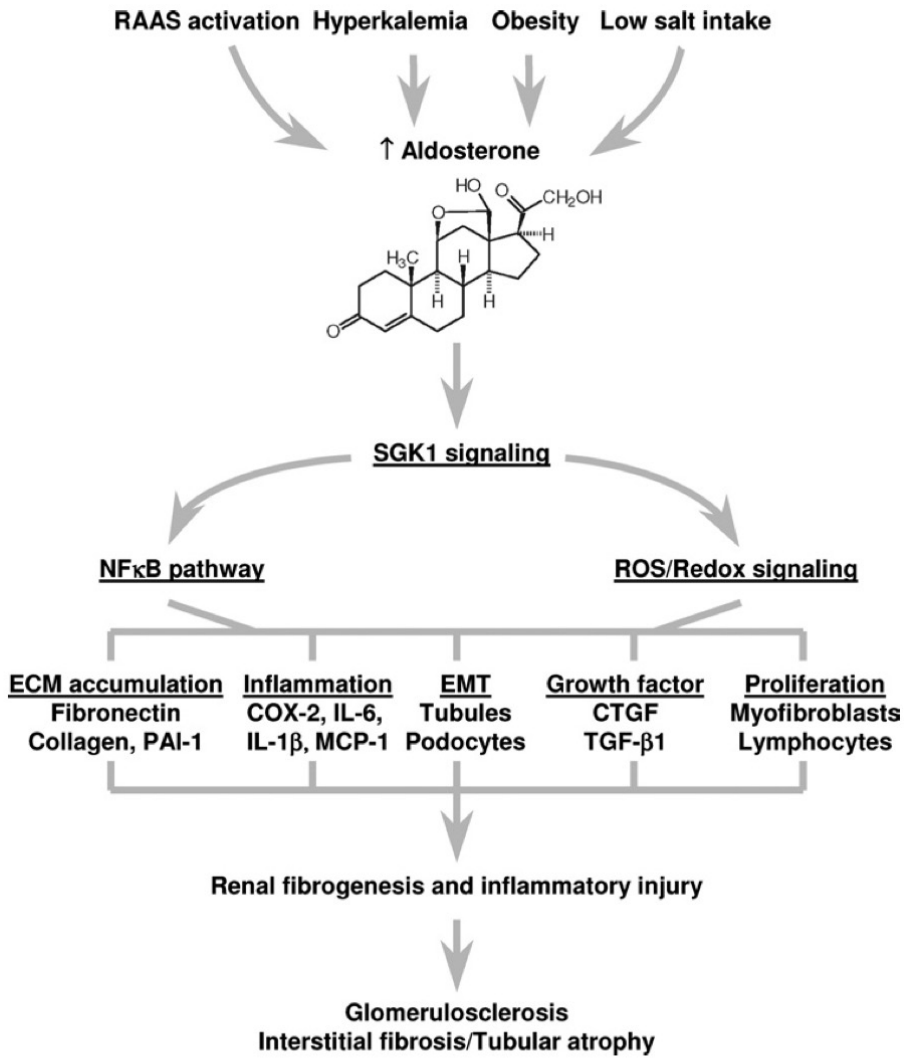
**Table 4** Association of serum aldosterone and chronic kidney disease progression (50% estimated glomerular filtration rate decline or end-stage kidney disease) and end-stage kidney disease alone using death as a competing event

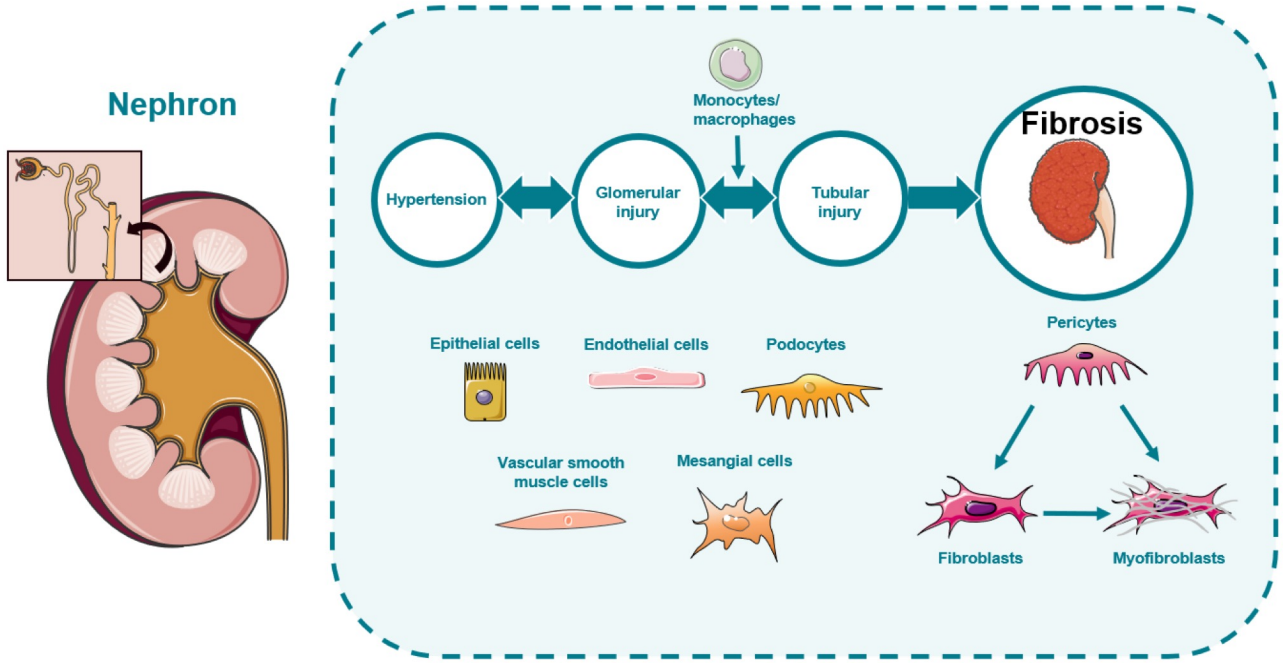
| Serum aldosterone | Continuous | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
|---|---|---|---|---|---|
| **Association of serum aldosterone and CKD progression (50% eGFR decline or ESKD) using death as a competing event** | | | | | |
| Events | 1412 | 285 | 361 | 390 | 376 |
| Crude | 1.11 (1.05–1.17) | Reference | 1.31 (1.11–1.54) | 1.47 (1.25–1.73) | 1.42 (1.20–1.67) |
| Multivariable Model 1[a] | 1.11 (1.05–1.17) | Reference | 1.24 (1.05–1.46) | 1.41 (1.20–1.66) | 1.38 (1.17–1.62) |
| Multivariable Model 2[b] | 1.14 (1.07–1.21) | Reference | 1.25 (1.05–1.50) | 1.51 (1.26–1.81) | 1.55 (1.30–1.86) |
| Multivariable Model 3[c] | 1.04 (0.97–1.11) | Reference | 1.10 (0.92–1.32) | 1.15 (0.95–1.39) | 1.16 (0.96–1.40) |
| Multivariable Model 4[d] | 1.09 (1.01–1.16) | Reference | 1.03 (0.85–1.26) | 1.17 (0.96–1.42) | 1.23 (1.03–1.48) |
| **Association of serum aldosterone and ESKD using death as a competing event** | | | | | |
| Events | 1129 | 225 | 273 | 314 | 317 |
| Crude | 1.13 (1.07–1.20) | Reference | 1.24 (1.03–1.49) | 1.51 (1.26–1.80) | 1.55 (1.29–1.85) |
| Multivariable Model 1[a] | 1.13 (1.06–1.21) | Reference | 1.18 (0.98–1.43) | 1.44 (1.20–1.72) | 1.52 (1.26–1.82) |
| Multivariable Model 2[b] | 1.17 (1.10–1.26) | Reference | 1.18 (0.97–1.45) | 1.56 (1.28–1.90) | 1.73 (1.42–2.10) |
| Multivariable Model 3[c] | 1.04 (0.96–1.12) | Reference | 1.01 (0.82–1.25) | 1.07 (0.86–1.33) | 1.17 (0.94–1.45) |
| Multivariable Model 4[d] | 1.09 (1.01–1.18) | Reference | 0.95 (0.75–1.20) | 1.07 (0.85–1.35) | 1.25 (1.00–1.55) |

In summary, we show that serum aldosterone concentrations are inversely correlated with eGFR and positively associated with 24 h urine protein at baseline, and independently associated with progression of CKD and incident ESKD. Importantly, this association between aldosteronism and CKD progression was evident in participants with and without diabetes. Given recent landmark clinical trials establishing MR antagonism as a therapy to delay the progression of CKD, the current findings provide a mechanistic explanation for the biological basis for MR antagonists in CKD.

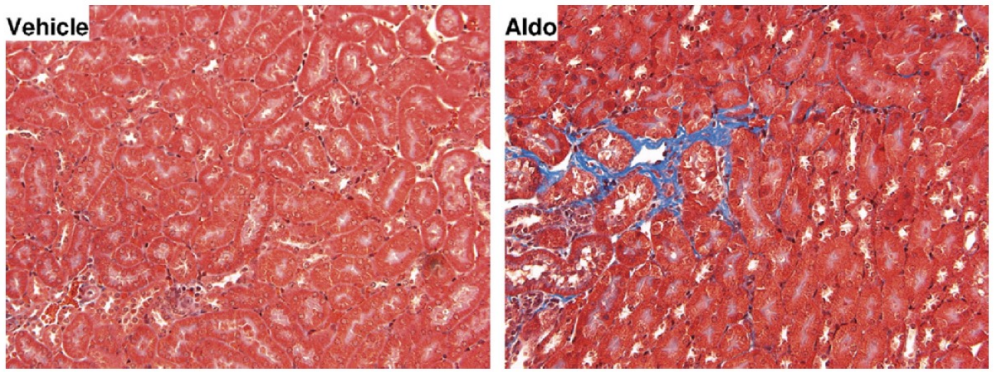
# Aldosterone-Induced Fibrosis in the Kidney: Questions and Controversies

*Andrew S. Brem, MD,[1] David J. Morris, DPhil,[2] and Rujun Gong, MD, PhD[1]*




Am J Transl Res 2024;16(8):4246-4255

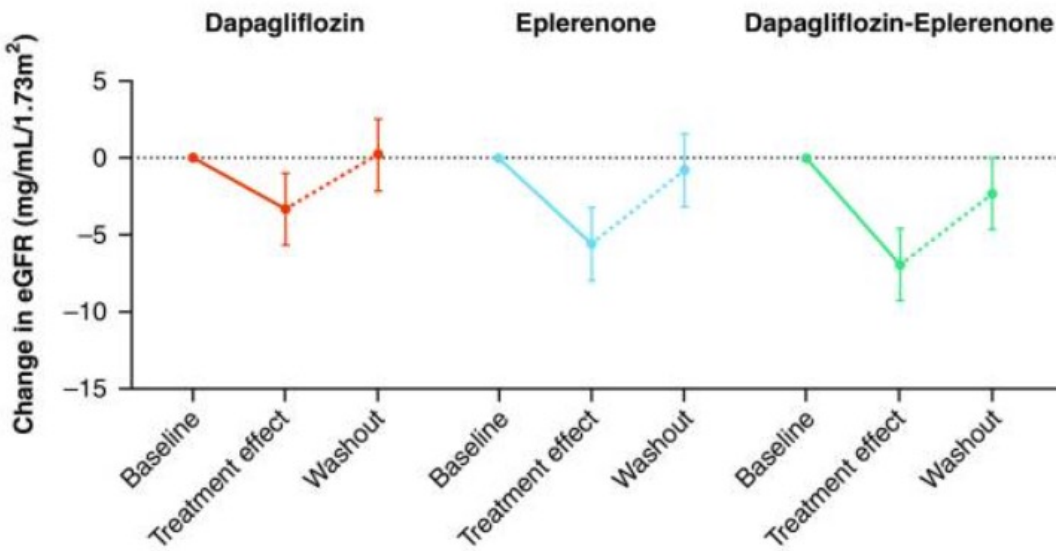


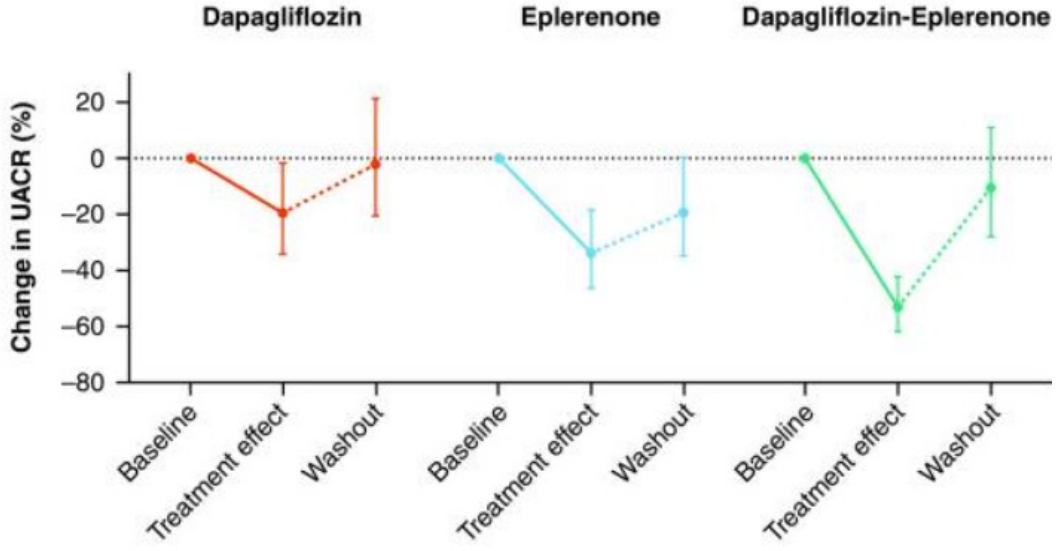
# Albuminuria-Lowering Effect of Dapagliflozin, Eplerenone, and Their Combination in Patients with Chronic Kidney Disease: A Randomized Crossover Clinical Trial

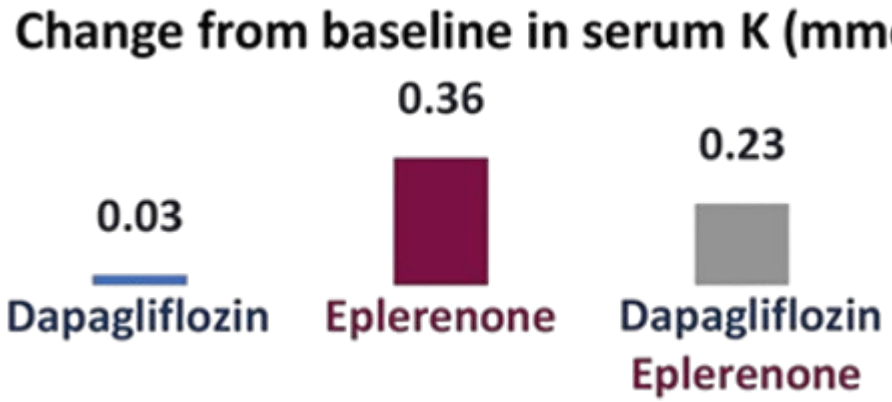
Provenzano, Michele[1]; Puchades, Maria Jesús[2]; Garofalo, Carlo[1]; Jongs, Niels[3]; D'Marco, Luis[4]; Andreucci, Michele[5]; De Nicola, Luca[1]; Gorriz, Jose Luis[2]; Heerspink, Hiddo J.L.[3,*] on behalf of the ROTATE-3 study group

*JASN* 33(8):p 1569-1580, August 2022.

**46 patients were assigned to 4-week treatment periods with dapagliflozin 10 mg/day, eplerenone 50 mg/day, or their combination in random order**



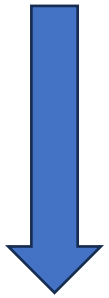
# M. M. ♂, 53 y

Nefrologia

**EE:** sCr 1.90 mg/dL, eGFR 42 ml/min, K 4.6 mmol/L, Proteinuria 840 mg/24h, **UACR 680 mg/g, NT-proBNP 658 pg/mL**

**PA:** 135/80 mmHg

1 mese



**Eplerenone 50 mg**
**Atorvastatina/Ezetimibe 40/10 mg**

**EE:** sCr 1.87 mg/dL, eGFR 42 ml/min, K 4.9 mmol/L, Proteinuria 420 mg/24h, **UACR 340 (-50%) mg/g, NT-proBNP 472 pg/mL (-24%)**

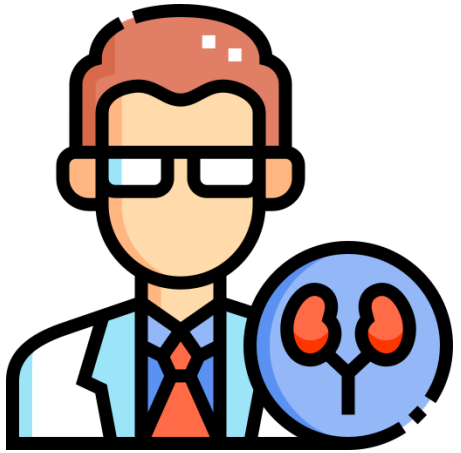
**PA:** 120/70 mmHg

# M. M. ♂, 53 y

## ...3 MESI DOPO

Nefrologia

Va dal curante lamentando l'aumento di volume bilaterale della regione mammaria associata a dolore, ha letto che può essere l'eplerenone e ha sospeso in autonomia l'Eplerenone. Il MMG reinvia al nefrologo



**Esami di laboratorio:**

- sCr 1.8 mg/dL, eGFR 44 ml/min, Urea 44 mg/dL
- Proteinuria 950 mg/24h, UACR 780 mg/g
- NT-proBNP 552 pg/mL

**Esame obiettivo:**

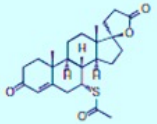
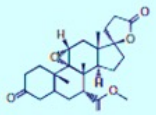
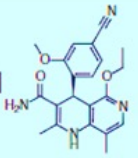
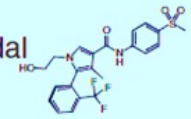
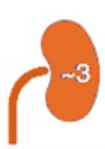
- Altezza 175 cm, Peso 87 kg, BMI 28 kg/m2
- PA 140/85 mmHg, FC 68 bpm, SpO2 96% in aa.

**Terapia in corso:**

Ramipril 5 mg 1 cp, **Dapagliflozin 10 mg**, Amlodipina 5 mg 1 cp, Atorvastatina/Ezetimibe 40/10 mg, Colecalciferolo 10.000U/ml 5 gtt

~~**Eplerenone 50 mg 1 cp**~~

*Modified from: Chaudhuri et al., Diabetes Obes Metab (2022)*

| Characteristic | Spironolactone | Eplerenone | Finerenone | Esaxerenone |
|---|---|---|---|---|
| Mineralocorticoid receptor class | Steroidal  | Steroidal  | Non-steroidal  | Non-steroidal  |
| Potency | High | Low | High | High |
| Selectivity | Low | Medium | High | High |
| Metabolites | Multiple Active | No active | No active | Multiple Activity unknown |
| Half-life | >12 h (Healthy volunteers); ≥24 h (Patients) | ~3 h (Healthy volunteers); 4-6 h (Patients) | 2.2 h (Healthy volunteers); 2.8 h (Patients) | ~20 h (Healthy volunteers) |
| Tissue distribution in rodents | >6  1  | ~3  1  | 1  1  | Unknown |

M. M. ♂, 53 y

**Provvedimenti:**

- Prescrizione off-label di **Finerenone 20 mg**

Nefrologia

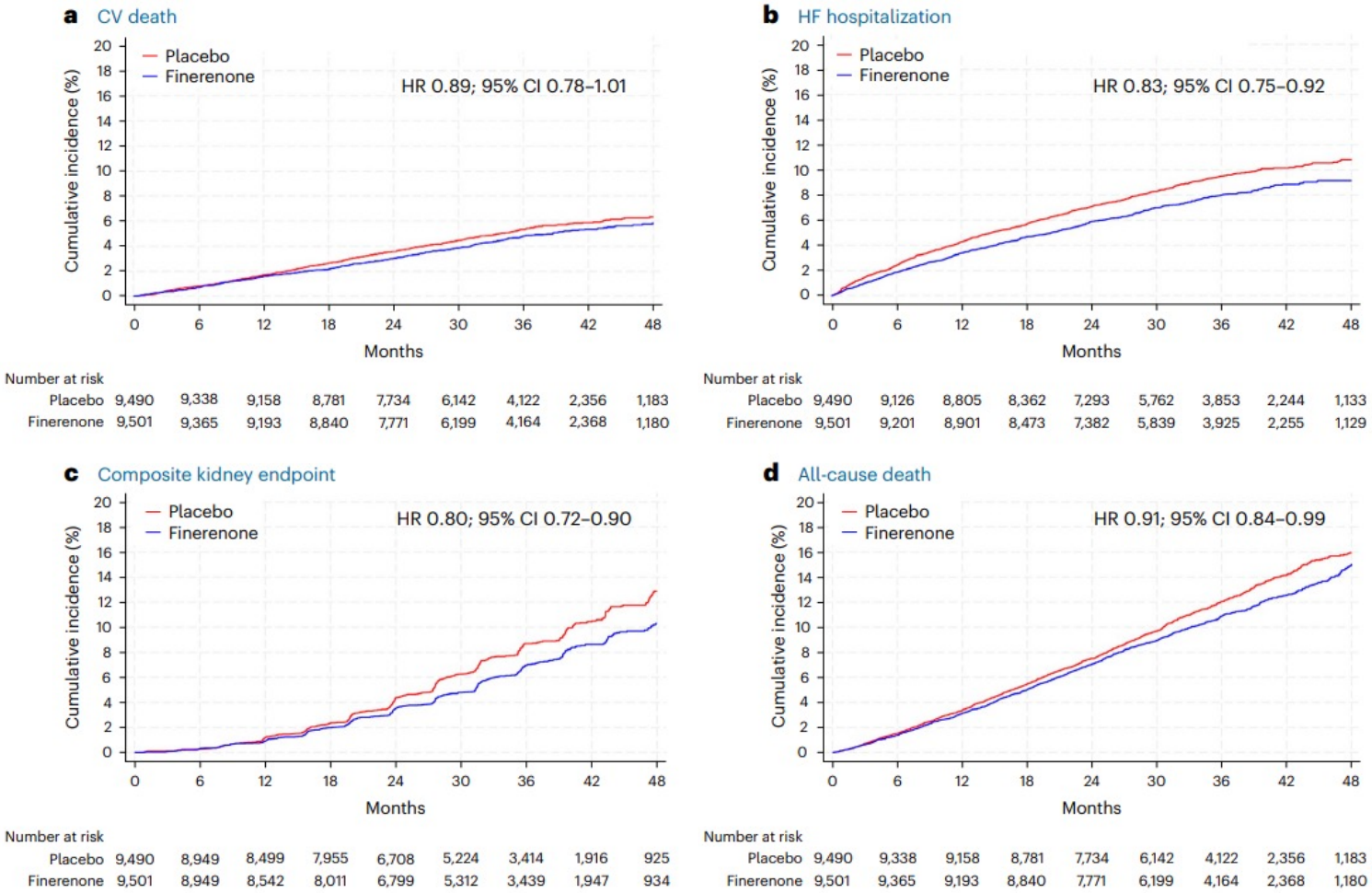
# Finerenone in heart failure and chronic kidney disease with type 2 diabetes: FINE-HEART pooled analysis of cardiovascular, kidney and mortality outcomes

Muthiah Vaduganathan, Gerasimos Filippatos, Brian L. Claggett, Akshay S. Desai, Pardeep S. Jhund, Alasdair Henderson, Meike Brinker, Peter Kolkhof, Patrick Schloemer, James Lay-Flurrie, Prabhakar Viswanathan, Carolyn S. P. Lam, Michele Senni, Sanjiv J. Shah, Adriaan A. Voors, Faiez Zannad, Peter Rossing, Luis M. Ruilope, Stefan D. Anker, Bertram Pitt, Rajiv Agarwal, John J. V. McMurray & Scott D. Solomon

Nature Medicine **30**, 3758–3764 (2024)

**Pooled analysis of 18.991 participants with and without T2DM from:**

- ❑ FIDELIO-DKD (diabetes ckd outcome)
- ❑ FIGARO-DKD (diabetes HF outcome)
- ❑ **FINEARTS-HF** (diabetes **and non diabetes**, outcome HFpEF)



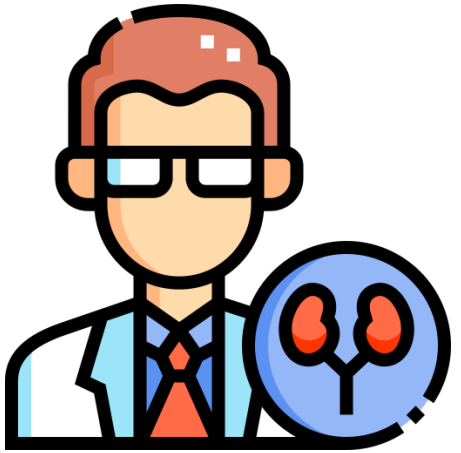
M. M. ♂, 53 y

## ...3 MESI DOPO

Nefrologia

**Esami di laboratorio:**

- sCr 1.7 mg/dL, eGFR 46 ml/min, Urea 42 mg/dL
- Na 138 mmol/L, K 4.9 mmol/L, Mg 1.8 mg/dL
- **Proteinuria 350 mg/24h, UACR 230 mg/g**
- **LDL 85 mg/dL**
- **NT-proBNP 330 pg/mL**

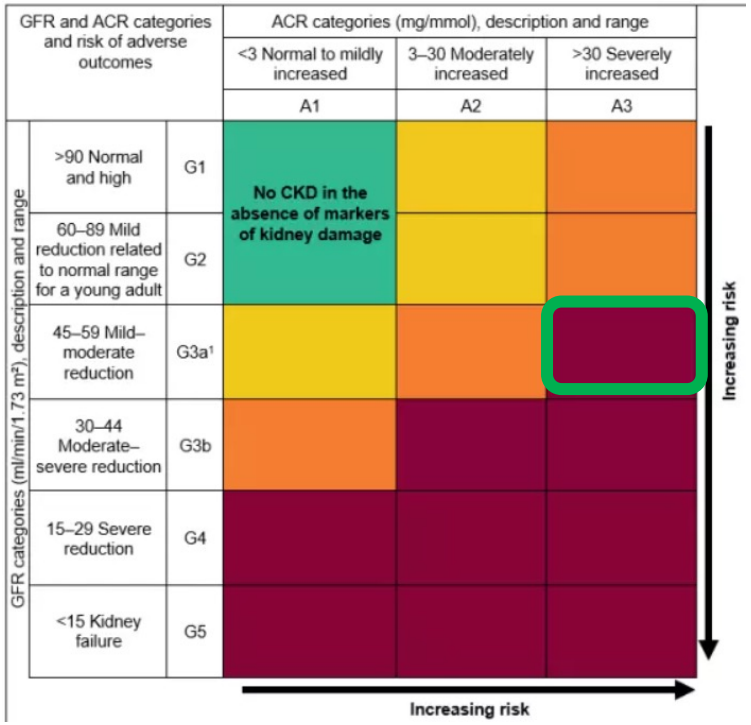


**Esame obiettivo:**

- BMI 28 kg/m2
- **PA 120/80 mmHg**,

- **Terapia in corso:**

Ramipril 5 mg 1 cp, Dapagliflozin 10 mg 1 cp, Finerenone 20 mg 1 cp, Amlodipina 5 mg 1 cp, Atorvastatina/Ezetimibe 40/10 mg 1 cp, Colecalciferolo 10.000U/ml 5 gtt




**5y Kidney Failure**

**Risk Equation 7.58 % ⟶ 3.99 %**

**10y PREVENT-CVD 20.8% ⟶ 15.19%**

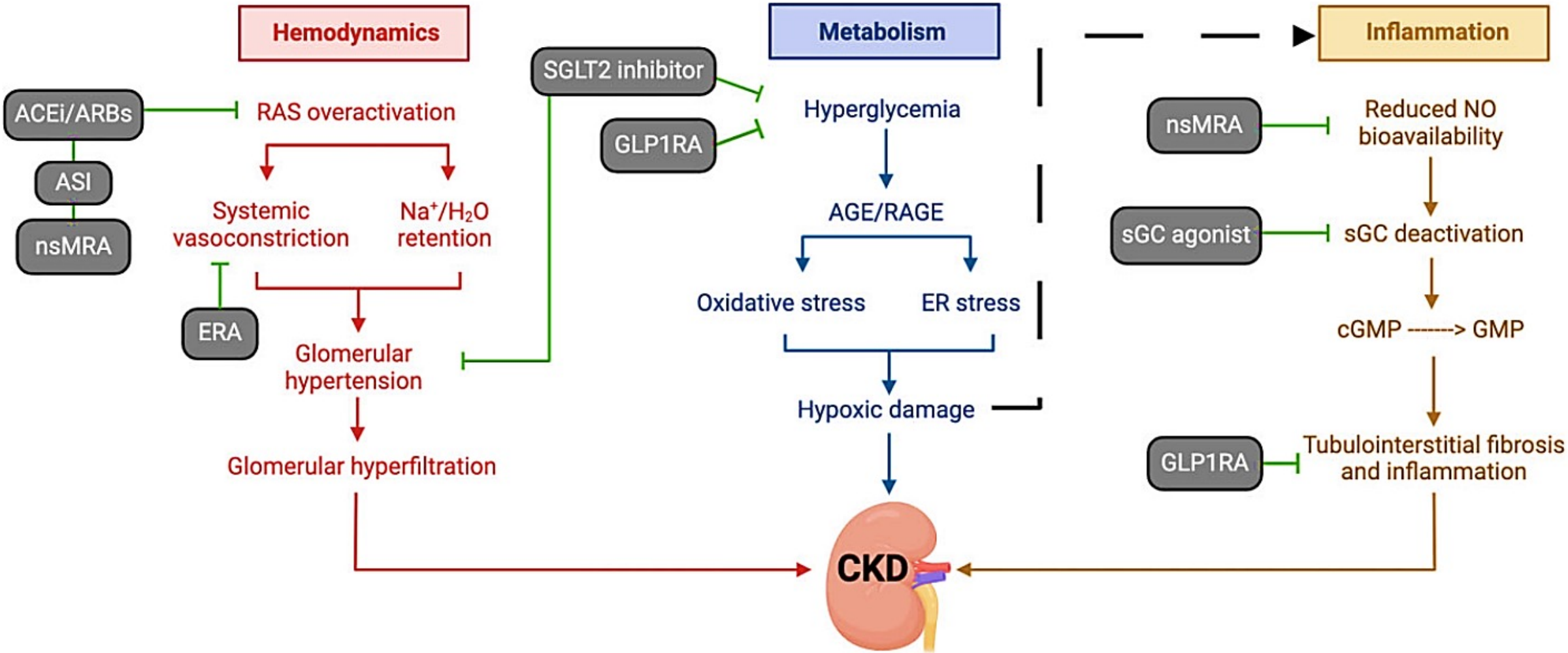
**Provvedimenti futuri:**

- Quadro lipidico non a target (target <55 mg/dL) -> in corso valutazione per terapia con PCSK9i.
- Peso non a target -> si raccomanda compliance dietetica. Si raccomanda esercizio fisico. Da valutare in futuro prescrivibilità di GLP1-RA o GLP1/GIP-RA

# Upcoming drug targets for kidney protective effects in chronic kidney disease

Nephrol Dial Transplant, 2025, 40, i47–i58

Massimo Nardone, Kevin Yau, Luxcia Kugathasan, Ayodele Odutayo, Mai Mohsen, Jean-Philippe Ouimet, Vikas S. Sridhar and David Z.I. Cherney



# La Nefrologia di Bologna


Prof. Vittorio Bonomini


Prof. Pietro Zucchelli

Prof. Antonio Santoro

è tanta roba