# Recommendations for Management of **Chronic Kidney Disease In Primary Care**

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Beacon Hospital
THIS IS MODERN MEDICINE

# Overview

- ***"WHY"*** *does Chronic Kidney Disease (CKD) matter ?*
  - *How many CKD patients I treat?*

- ***"HOW"*** *can we make a difference in CKD management?*
  - *Is my practice up-to-date?*

- ***"WHO"*** *can provide greater impact in CKD management?*
  - *GP vs Nephrologist score?*

# Does Brian's Story Look Familiar?

**2008, age 45 years**

**Hypertension identified on routine health check (confirmed on second visit)**

**Commenced ramipril 2.5 mg OD**

**BP: 149/83 mmHg**

**HbA1c: 33.3 mmol/mol (5.2%)**

**eGFR 72 mL/min/1.73m$^2$**

**uACR 30 mg/g (3.39 mg/mmol)**

**2011, age 48 years**

**Ramipril increased to 5 mg OD**

**BP: 150/95 mmHg**

**HbA1c: 32.2 mmol/mol (5.1%)**

**eGFR 60 mL/min/1.73m$^2$**

**uACR 69 mg/g (7.8 mg/mmol)**

**2016, age 53 years**

**Ramipril increased to 10 mg OD, atorvastatin 20 mg OD introduced**

**BP: 152/89 mmHg**

**HbA1c: 35.5 mmol/mol (5.4%)**

**eGFR 44 mL/min/1.73m$^2$**

**uACR 102 mg/g (11.53 mg/mmol)**

**2023, age 60 years**

**25% decline in eGFR the last 12 months, despite maximally tolerated dose of ACEi**

**BP: 160/85 mmHg**

**HbA1c: 37.0 mmol/mol (5.5%)**

**TC: 4.8 mmol/L**

**Non-HDL: 3.7 mmol/L**

**eGFR 29 mL/min/1.73m$^2$**

**uACR 175 mg/g (19.78 mg/mmol)**

**BMI: 27.2 kg/m$^2$**



A hypothetical patient. ACEi: angiotensin-converting enzyme inhibitor; BMI: body mass index; BP: blood pressure; eGFR: estimated glomerular filtration rate; HDL: high-density lipoprotein; OD: once daily; TC: total cholesterol; uACR: urine albumin to creatinine ratio.

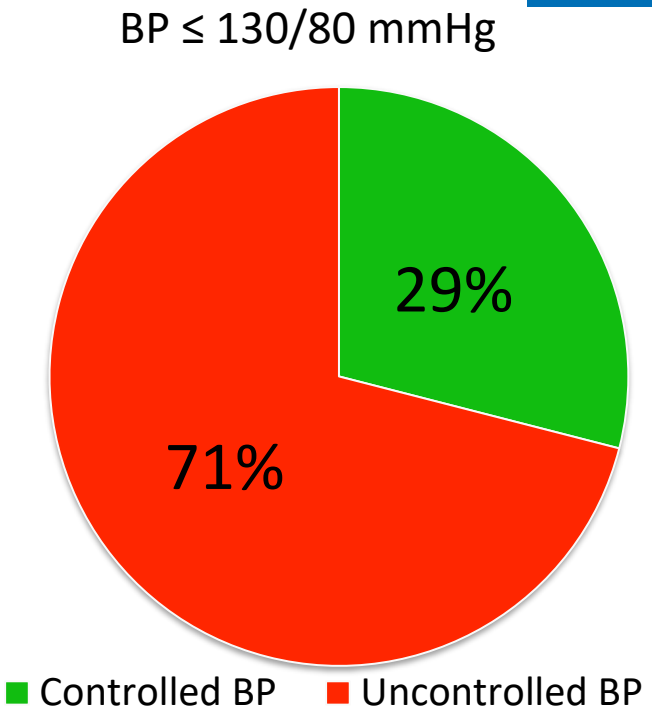
# CKD Awareness & BP Control in Ireland


**2** out of **100** participants are aware of CKD

**Blood pressure control amongst TILDA participants diagnosed with CKD**

**≤130/80 mmHg**

**(AHA/AAC/KDIGO/ASN/EASD)**




The Irish Longitudinal Study on Ageing 2023. Chronic Kidney Disease in community-dwelling adults aged 50+ years in Ireland: A Report from TILDA and the National Renal Office.

# Epidemiology of chronic kidney disease: an update 2022

kidney INTERNATIONAL supplements

ISN INTERNATIONAL SOCIETY OF NEPHROLOGY

## Extremely common

**843,6** Million in 2017

Approximately **1 in 10**


## Increasing death rate

**+41.5%** 1990 to 2017


## Large burden in low- and middle-income countries

Among the **top 10 causes** of death in Singapore, Greece, and Israel

Kovesdy, 2022

**874** Million adults living with **SBP≥140mmHg** (2015)

**537** Million adults living with **diabetes** (2021)

**244** Million adults living with **IHD** (2020)

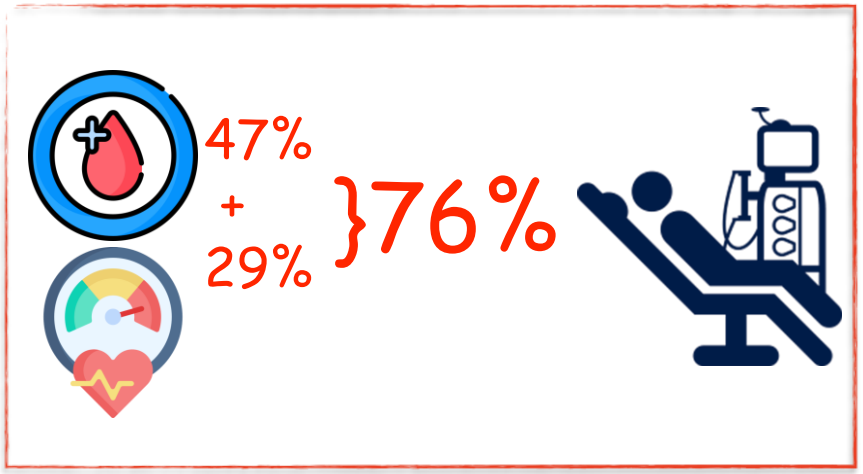
**89** Million adults living with **Stroke** (2020)

**7** Million Deaths by **COVID-19** (2019-2024)

**1.23** Million Deaths by **CKD** (2017)

# Average CKD Prevalence and Risk Groups - the Facts

- 1/10 people with CKD across all age groups
- 1/7 people in Ireland aged ≥50 have CKD
- 1/5 people with HTN have CKD
- 1/3 people with DM have CKD




Other risk factors:
- Obesity increases by 83% the risk of CKD
- Family history in 30% of Irish people with CKD
- Other: age ≥60, smoking, African ancestry, Latinos and minority populations, prior AKI, Heart disease, drug abuse…

# **Chronic Kidney Disease** Means Abnormal Renal **Structure** or **Function** for **≥ 3 Months**

## A. Structure

- Structural abnormalities detected by imaging
- Renal histological abnormalities

## B. Function (historical record on at least 2 occasions 90 days apart)

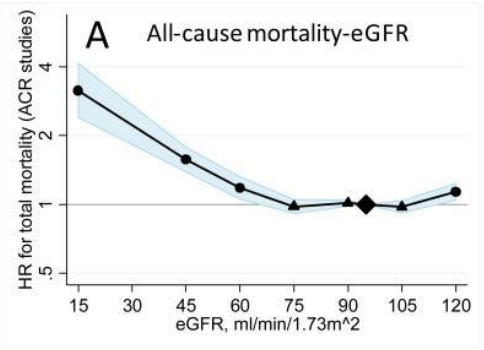
- eGFR ≤ 60 ml/min/1.73m2 (based on validated Creatinine or Cystatin C formulas)
- Albuminuria (uACR ≥ 3 mg/mmol or ≥30 mg/g)
- Haematuria (presumed or confirmed renal origin)
- Electrolyte abnormalities due to tubular disorders

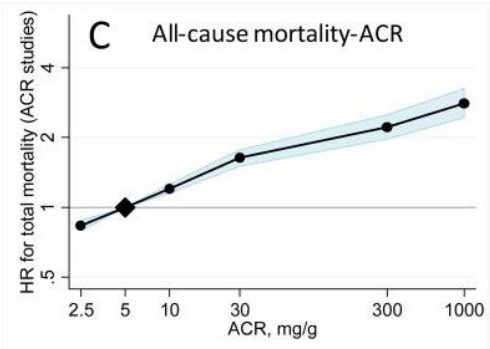
## C. History of kidney transplantation

# Making a Difference in CKD Management - "The CGA Approach"

*CKD is defined as abnormalities of kidney structure or function, present for a minimum of 3 months, with implications for health.*

*CKD is classified based on Cause, Glomerular filtration rate (GFR) category (G1–G5), and Albuminuria category (A1–A3), abbreviated as CGA.*




**KDIGO: Prognosis of CKD by GFR and albuminuria categories**

| 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 >30 mg/mmol |
| | G1 | Normal or high | ≥90 | | | |
| | G2 | Mildly decreased | 60–89 | | | |
| | G3a | Mildly to moderately decreased | 45–59 | | | |
| | G3b | Moderately to severely decreased | 30–44 | | | |
| | G4 | Severely decreased | 15–29 | | | |
| | G5 | Kidney failure | <15 | | | |

**Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red: very high risk. GFR, glomerular filtration rate.**



*Chronic Kidney Disease Prognosis Consortium. Lancet. 2010 Jun 12*

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

# CKD-PC Hazar ratios (age <65) for 10 variables

**All-cause mortality, CV mortality, AMI, HF, Stroke, AFib, PAD, AKI, RRT need and Hospitalisation**

CGA approach in CKD

**C**. Cause

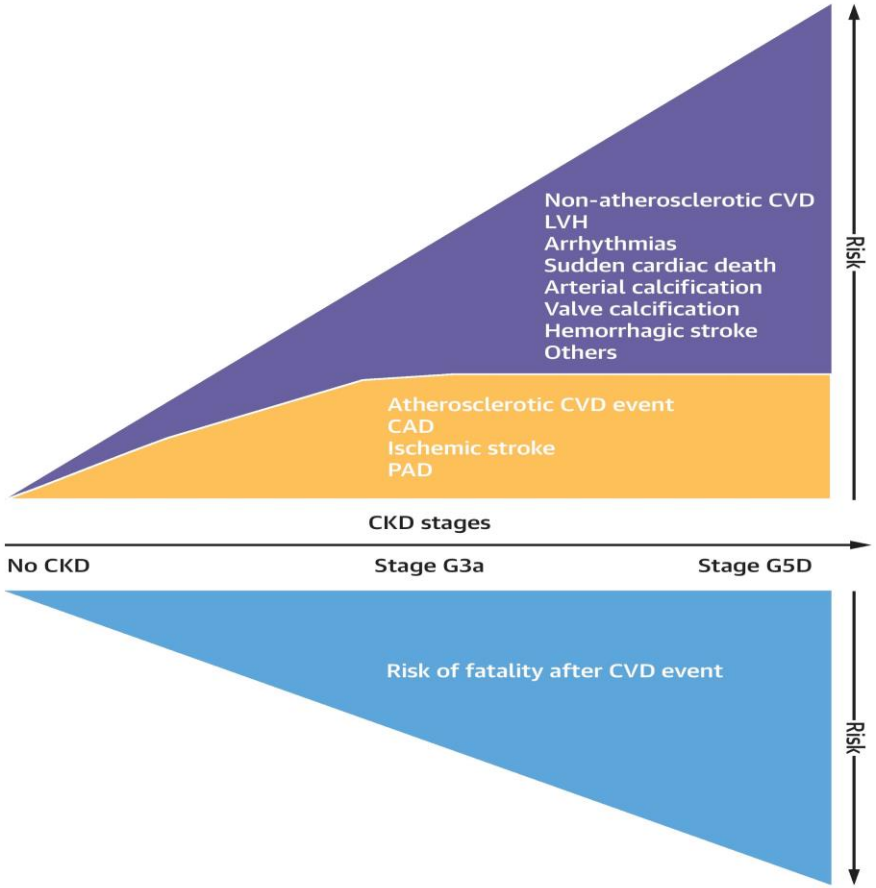
**G**. GFR

**A**. Albuminuria

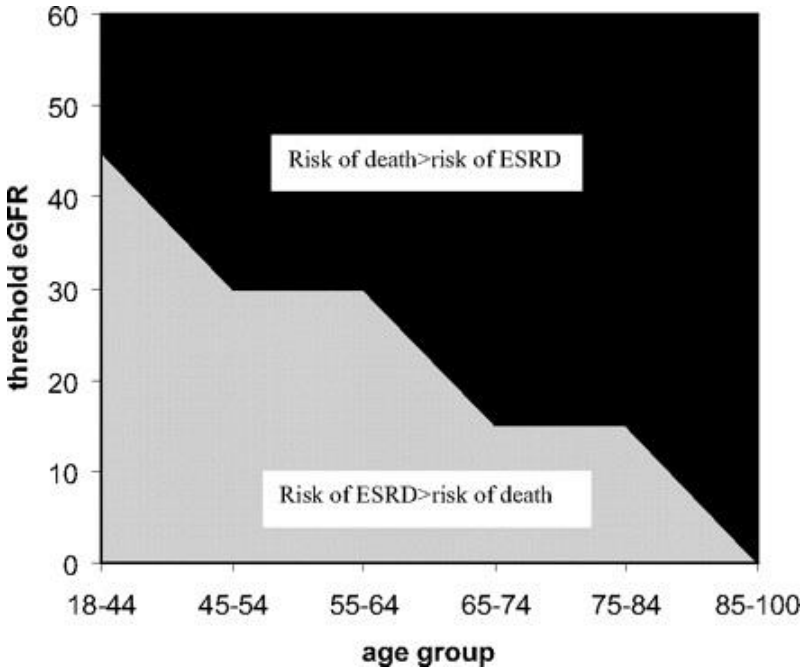
| | | **Categories of ALBUMINURIA** | | | |
|---|---|---|---|---|---|
| | | Normal range uACR | Mild increase of uACR | Moderate increase of uACR | Severe increase of uACR |
| | | **A1** | **A1** | **A2** | **A3** |
| | | **≤1 mg/mmol** | **1-3 mg/mmol** | **3-29 mg/mmol** | **≥30 mg/mmol** |
| **Increased eGFR** | **≥105** | 0.57 - 1 | 0.77-1.9 | 1.1 - 2.3 | 1.5 - 12 |
| **G1** | **90-104** | REFERENCE | 1.1 - 1.8 | 1.2 - 3.9 | 1.3 - 11 |
| **G2** | **60-89** | 1.1 - 1.9 | 1.2 - 3.7 | 1.3 - 8.3 | 1.6 - 33 |
| **G3a** | **45-59** | 1.3 - 7 | 1.7 - 16 | 1.5 - 28 | 2 - 100 |
| **G3b** | **30-44** | 1.5 - 22 | 1.8 - 34 | 1.6 - 109 | 2.1 - 210 |
| **G4-G5** | **<30** | 1.4 - 335 | 2.4 - 267 | 2.4 - 419 | 3.5 - 625 |

Modified from KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease, Kidney Int (2024) 105

# Changes in CV Risk with CKD Progression, Risk of RRT and Death




Sarnak, M.J. et al. J Am Coll Cardiol. 2019




O'Hare, AM. et al. J Am Soc Nephrol. 2007

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# Decision Making Heat-Map in CKD

CGA approach in diagnosis and staging of CKD
C. Cause
G. GFR
A. Albuminuria

**Categories of ALBUMINURIA** by Urine Albumin to Creatinine Ratio (uACR) in first-morning midstream urine sample

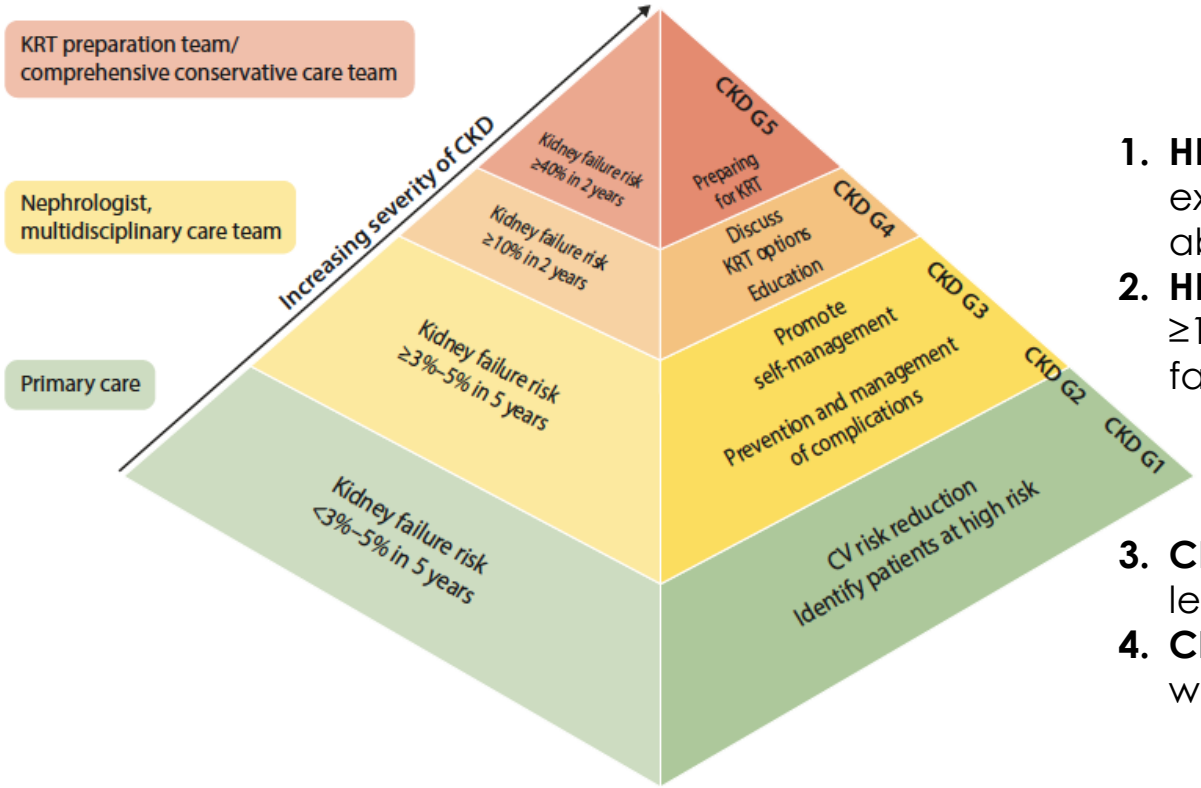
**Estimated Glomerular Filtration Rate (eGFR) categories** (ml/min/1.73m2) defined by validated formulas using filtration markers such as Creatinine or Cystatin-C

| | | | Normal or mild increase of uACR | Moderate increase of uACR | Severe increase of uACR |
|---|---|---|---|---|---|
| | | | **A1** | **A2** | **A3** |
| | | | **< 3 mg/mmol** | **3-29 mg/mmol** | **≥30 mg/mmol** |
| Normal / High eGFR | **G1** | **≥90** | Screen 1 | Treat 1 | Treat 3 |
| Mild decrease of eGFR | **G2** | **60-89** | Screen 1 | Treat 1 | Treat 3 |
| Mild to Moderate eGFR decrease | **G3a** | **45-59** | Treat 1 | Treat 2 | Treat 3 |
| Moderate to Severe eGFR decrease | **G3b** | **30-44** | Treat 2 | Treat 3 | Treat 3 |
| Severe decrease of eGFR | **G4** | **15-25** | Treat 3 | Treat 3 | Treat 4+ |
| Life-threatening renal failure / RRT | **G5** | **<15** | Treat 4+ | Treat 4+ | Treat 4+ |



Modified from KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease, Kidney Int (2024) 105

# Making a Difference in CKD Management - "Healthy Life 4 Healthy Kidneys"




## 4 "Healthy" KIDNEYS TIPS:

1. **HEALTHY LIFESTYLE** - BMI≤28, regular exercise, NO smoking, NO alcohol abuse, NO drug misuse
2. **HEALTHY DIET** - Mediterranean or DASH, ≥1.5 L of water a day, LOW salt, animal fat and ultra-processed food
3. **CHECK** your Blood Pressure, Glucose levels and Cholesterol profile
4. **CHECK** your Renal function if you are within a risk group for CKD



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

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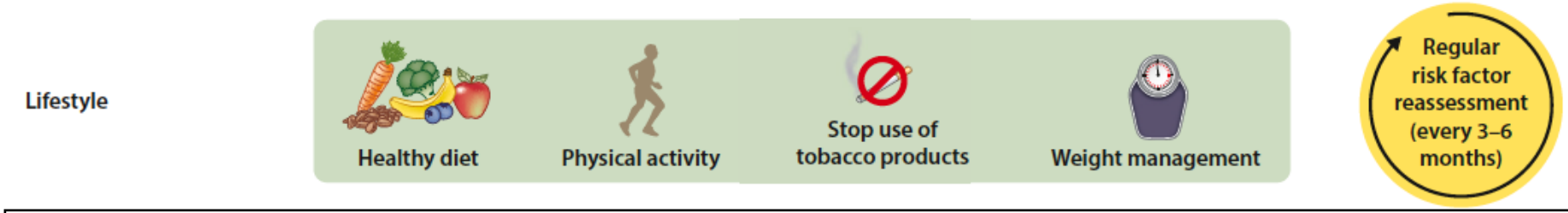
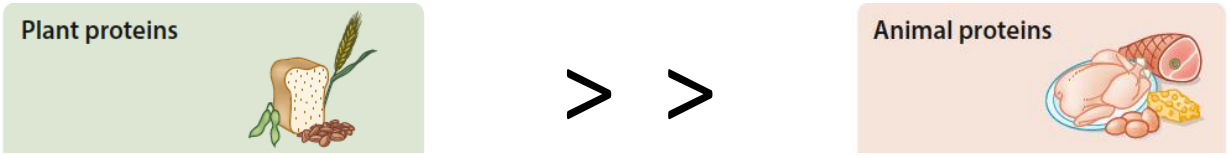
# Lifestyle in CKD




***Recommendation 3.2.2.1:***
*We recommend that people with CKD be advised to undertake **moderate-intensity physical activity** for a cumulative duration of at least **150 minutes per week**, or to a level compatible with their cardiovascular and physical tolerance. **(1D)***

***Recommendation 3.3.1.1:***
*We suggest maintaining a **protein intake of 0.8 g/kg body weight/d** in adults with CKD G3–G5. **(2C)***

***Recommendation 3.3.2.1:***
*We suggest that **sodium intake** be <2 g of sodium per day (or <90 mmol of sodium per day, or **<5 g of NaCl per day**) in people with CKD. **(2C)***





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# CKD Management - “The Right Treatment for the Right Person at the Right Time”

First-line drug therapy for most patients

SGLT2i continue until dialysis or transplant

+

Aim for SBP <120 mm Hg RAS inhibitor* at maximum tolerated dose (if HTN)

Statin-based therapy moderate- or high-intensity statin

**FIRST-LINE TREATMENT grade of evidence-based recommendation:**

- **1A** - **SGLT2i** for people with **CKD (eGFR ≥20 ml/min)** and **T2DM**
- **1A** - **SGLT2i** for people with **CKD (eGFR ≥20 ml/min) and albuminuria (uACR ≥20 mg/mmol)**
- **1A** - **SGLT2i** for people with **CKD and heart failure**, irrespective of level of albuminuria
- **1A** - **Statin or Statin/ezetimibe** for people aged **≥50 with CKD** without RRT or transplant
- **1B** - **RASi (ACEi or ARB)** for people with **CKD (eGFR≥15 ml/min) and DM**, with **moderate-severe albuminuria (uACR ≥3 mg/mmol)**
- **1B** - **RASi (ACEi or ARB)** for people with **CKD (eGFR≥15 ml/min)** without diabetes, and **severely increased albuminuria (uACR ≥30 mg/mmol)**
- **1B** - **Long-acting GLP-1 RA** for people with **CKD and T2DM if anti-DM escalation treatment required**
- **1C** - **Low-dose Aspirin** for secondary prevention in people with **CKD and established ischaemic CV disease**
- **1C** - **NOACs > Warfarin** for **Atrial Fibrillation** thromboprophylaxis in people with **CKD G1-G4 (eGFR≥15 ml/min)**
- **1C** - **Uric acid-lowering** intervention for people with **CKD and symptomatic hyperuricemia**



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# Brian's CV-risk Assessment

**2016, age 53 years**

**Ramipril increased to 10 mg OD, atorvastatin 20 mg OD introduced**

**BP: 152/89 mmHg** **eGFR 44 mL/min/1.73m²**

**HbA1c: 35.5 mmol/mol (5.4%)** **uACR 102 mg/g (11.53 mg/mmol)**

**Kidney Measures**

| | |
|---|---|
| eGFR (estimated glomerular filtration rate) (mL/min/1.73m²) | 45 |
| Urine Albumin to Creatinine Ratio (mg/mmol) click on units to change between mg/g and mg/mmol | 11.3 |

Convert Urine Protein-Creatinine to Albumin-Creatinine

**SCORE2 Variables**

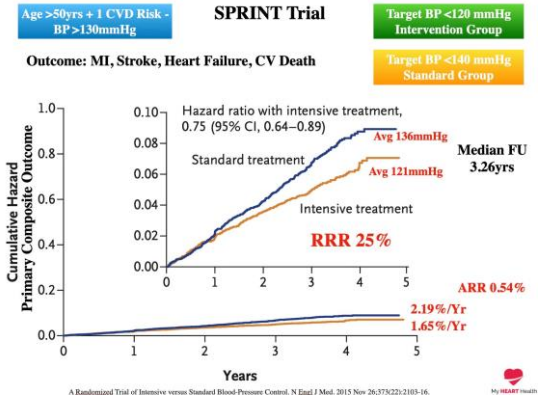
| | |
|---|---|
| Age (40-85yrs) | 53 |
| Gender | Male |
| Systolic Blood Pressure (mmHg) | 150 |
| Total Cholesterol (mmol/L) click on units to change between mg/dL and mmol/L | 4.9 |
| HDL Cholesterol (mmol/L) click on units to change between mg/dL and mmol/L | 1 |
| Smoking Status | Not Current Smoker |
| Diabetes | No |

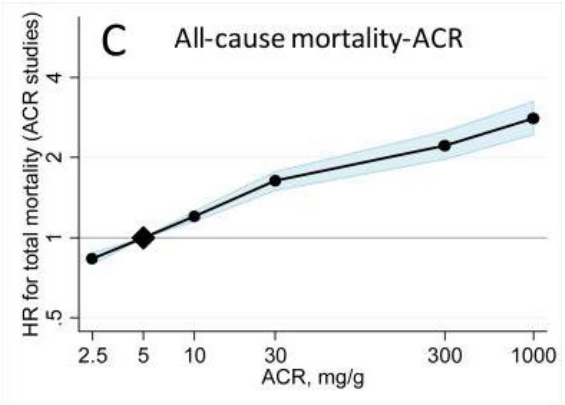
**Predicted 10 year risk of cardiovascular disease**

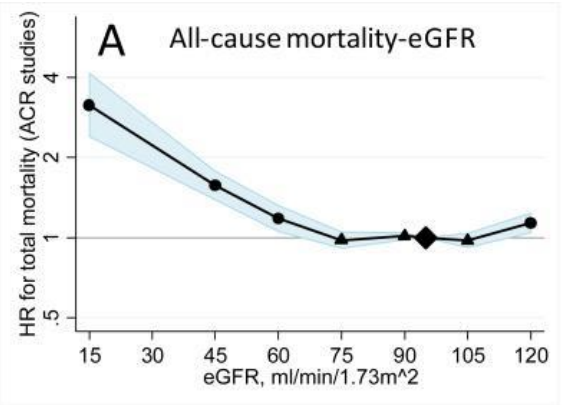
CKD Add-on is based on data from CKD-PC (Chronic Kidney Disease Prognosis Consortium)

| | Original SCORE2 | Original SCORE2 + CKD Add-on |
|---|---|---|
| Low risk countries | 4.7% | 11.3% |
| Medium risk countries | 5.9% | 14.2% |
| High risk countries | 6.1% | 14.6% |
| Very high risk countries | 11.0% | 25.3% |

# Brian's Therapeutic Goals?

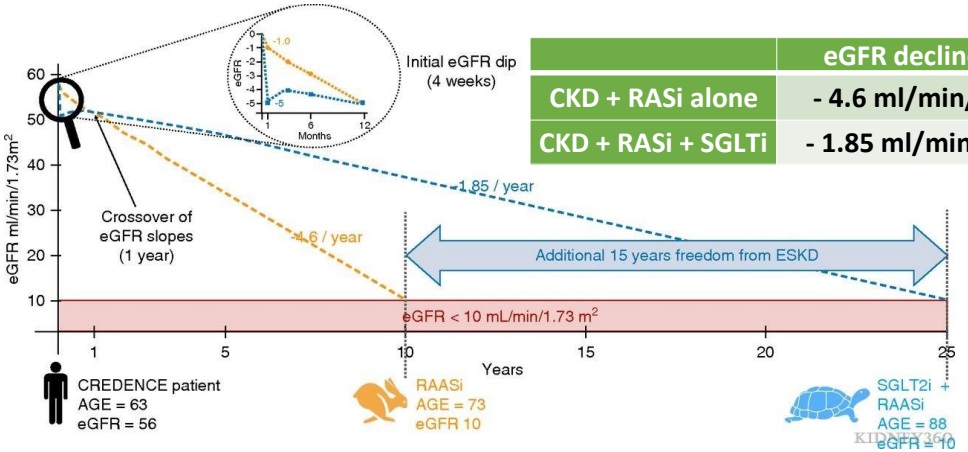


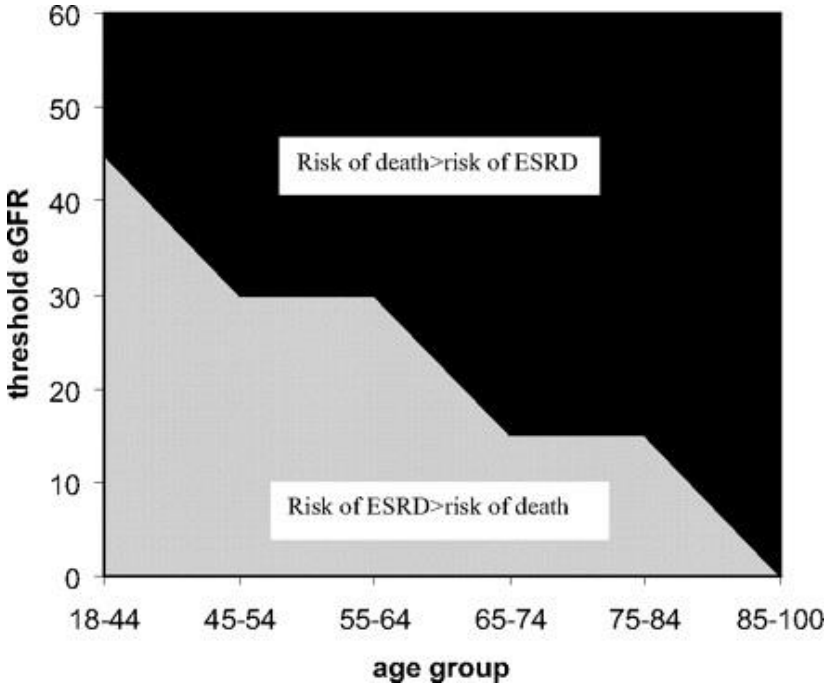

**SBP ≤ 120 mmHg** | **uACR ≤ 3 mg/mmol** | **eGFR ≥ 60 ml/min/1.73m2**

A. **SGLT2i (1A)**
B. **RASi (ACEi or ARB) (1B)**
C. **SBP ≤ 120 mmHg (2B)**

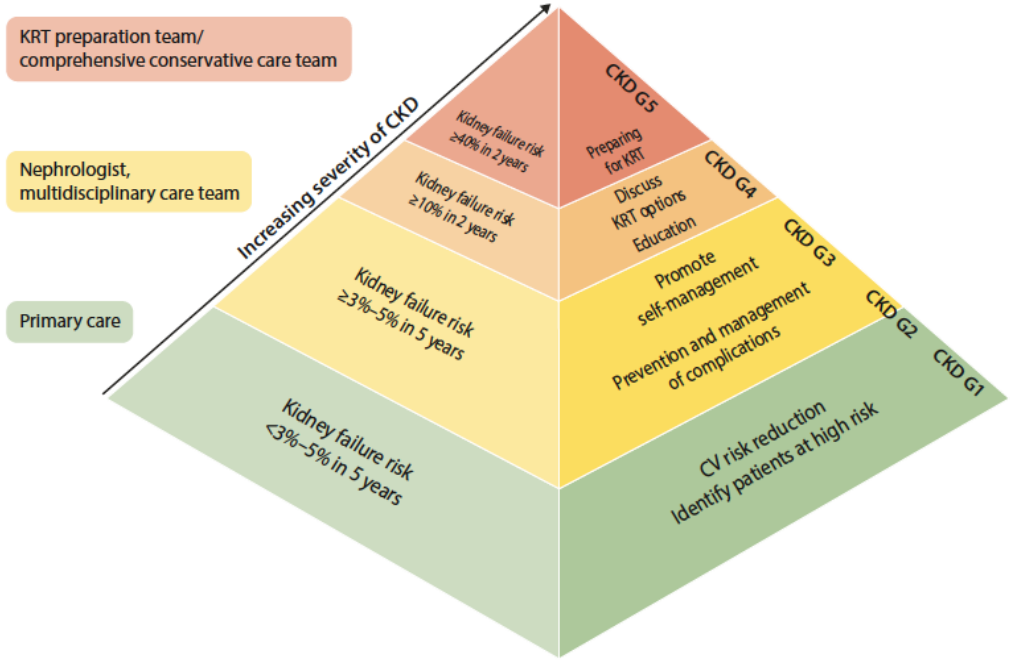



| | eGFR decline | ESKD stage |
|---|---|---|
| CKD + RASi alone | - 4.6 ml/min/y | In 10 years |
| CKD + RASi + SGLTi | - 1.85 ml/min/y | In 25 years |

# Life Expectancy and QoL - WHO Leads the Race?




Nephrologist ~ 15-30 OPD CKD patients/week




GP ~ 29 patients/day ~ 15 CKD patients/week



*O'Hare, AM. et al. J Am Soc Nephrol. 2007*
*KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney Int. 2024*

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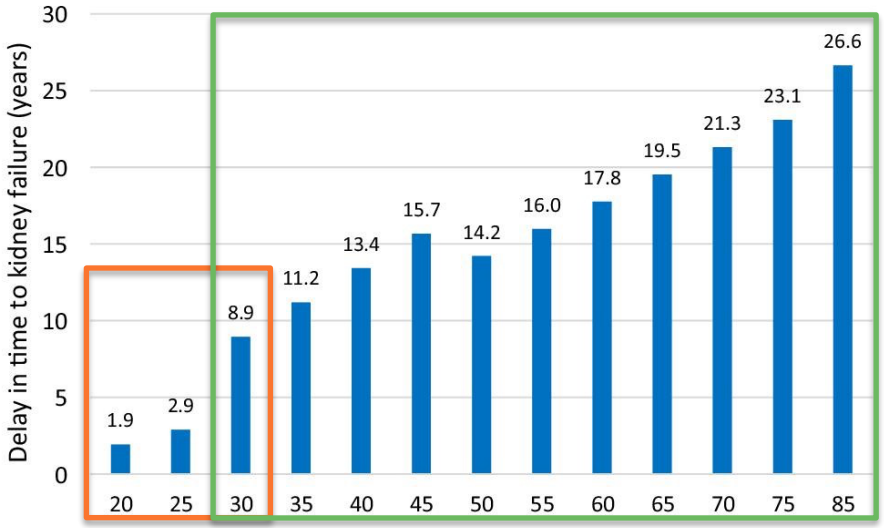
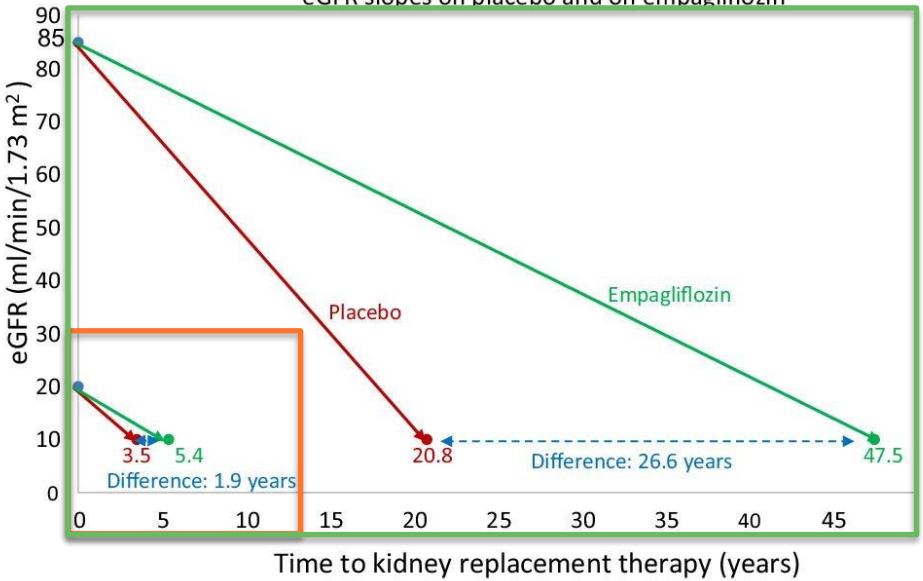
# Impact in CKD Management as Gained Years Without RRT
## GP (~2500) vs Nephrology (~47)

B) Delay in time to kidney failure in years on empagliflozin vs placebo, according to baseline eGFR




C) Potential impact on time to kidney replacement therapy of the different eGFR slopes on placebo and on empagliflozin




## Extrapolated from EMPA-KIDNEY trial, N 6609



*Fernández-Fernandez B, et al. Clinical Kidney Journal, August 2023*

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# Thank you



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