

CKD Monitoring & Proteinuria Testing

Overview

- 1) Changes to ICE CKD ordersets
- 2) When to check for 'proteinuria' (and why)
- 3) Interpretation of proteinuria results (dipstick, uACR, uPCR)
- 4) Lab testing for diagnosis and monitoring of CKD

Overview

- <https://edren.org>
- <https://edren.org/ren/gp-info>
- <https://edren.org/ren/handbook/unithdbk/ckd/proteinuria>
- <https://edren.org/ren/handbook/unithdbk/ckd/lab-testing-in-kidney-disease>
- <https://edren.org/ren/handbook/unithdbk/ckd/ckd-summary-overview>

NICE CKD Guidelines (2021)

KDIGO Guidelines on HTN and diabetic kidney disease (2021, 2022)

ICE CKD ordersets

For CKD **monitoring**:

- **eGFR > 30**: C&Es
- **eGFR < 30**: C&Es, alb, Ca²⁺, PO₄³⁻, FBC, uACR

For CKD **diagnosis**:

- **eGFR > 30**: C&Es, total cholesterol, HDL-C, uACR
- **eGFR < 30**: C&Es, total cholesterol, HDL-C, alb, Ca²⁺, PO₄³⁻, FBC, uACR

ICE CKD ordersets

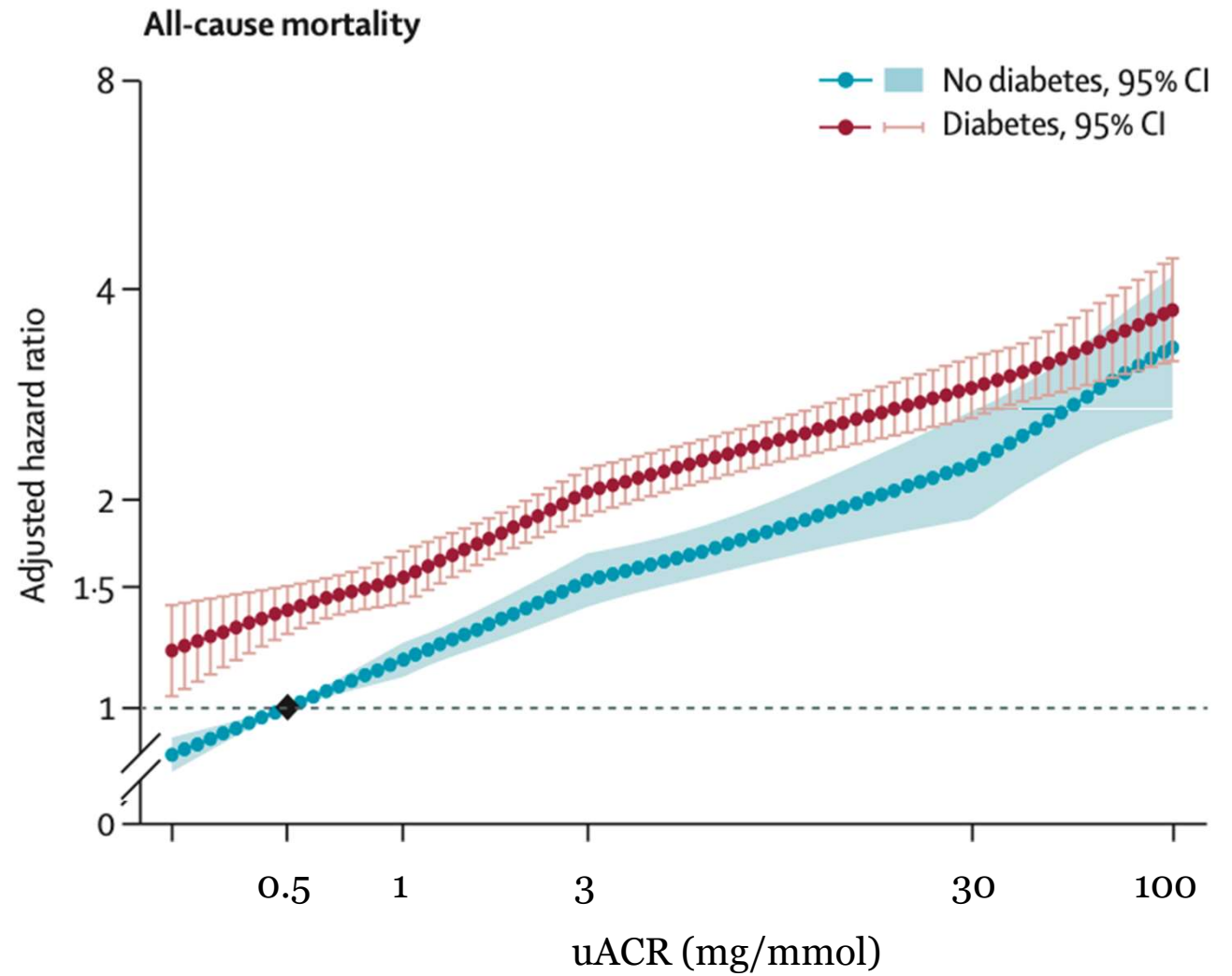
For CKD **monitoring**:

- **eGFR > 30**: C&Es
- **eGFR < 30**: C&Es, alb, Ca²⁺, PO₄³⁻, FBC, uACR

For CKD **diagnosis**:

- **eGFR > 30**: C&Es, total cholesterol, HDL-C, uACR
- **eGFR < 30**: C&Es, total cholesterol, HDL-C, alb, Ca²⁺, PO₄³⁻, FBC, uACR

**Why we test for proteinuria
&
When to check for proteinuria**



CKD Prognosis Consortium; Fox et al., (Lancet, 2012)

When to check for proteinuria

Where proteinuria testing can be **transformative**:

- suspicion of **nephrotic** syndrome
- suspicion of **intrinsic renal disease** (check for haematuria too)

Where proteinuria testing is likely to be **helpful**:

- new diagnosis of **CKD**
- screening in T1DM and **T2DM**
- screening in **pregnancy**
- patients eligible for **anti-hypertensives**

Where proteinuria testing is **unlikely to be helpful**:

- serial monitoring in stable CKD, particularly if proteinuria already high
- to “assess response” to established therapy

When to check for proteinuria

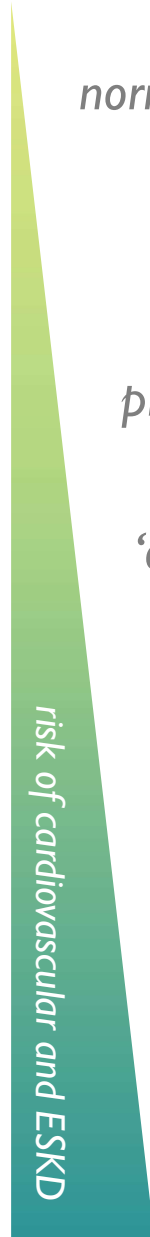
How does proteinuria assessment help in **known CKD**?

- risk-stratification for **CVS disease** *
- risk-stratification for **CKD progression** (and therefore frequency of monitoring, referral) *
- choice of **pharmacotherapy** (ACEi/ARB, SGLT2i, statin)
- setting **ABP targets**

** Albuminuria not incorporated into most widely-used CVS risk calculators but is in the 4vKFRE for estimating risk of ESKD.*

Interpreting proteinuria

dip	dip mg/dL	uPCR mg/mmol	uACR mg/mmol
neg	< 10	< 15	< 3
trace	< 20	15	3
		30	8
+	30	70	30
		100	50
++	100	140	70
+++	> 300	260	140
++++		> 350	> 200



normal

proteinuria in pregnancy

'overt' proteinuria

~1g protein per day

nephrotic



NORMAL

'MICROALBUMINURIA'

HEAVY ALBUMINURIA

dip	dip <i>mg/dL</i>	uPCR <i>mg/mmol</i>	uACR <i>mg/mmol</i>
neg	< 10	< 15	< 3
trace	< 20	15	3
		30	8
+	30	70	30
		100	50
++	100	140	70
+++	> 300	260	140
++++		> 350	> 200

risk of cardiovascular and ESKD

dip	dip mg/dL	uPCR mg/mmol	uACR mg/mmol
neg	< 10	< 15	< 3
trace	< 20	15	3
		30	8
+	30	70	30
		100	50
++	100	140	70
+++	> 300	260	140
++++		> 350	> 200

Consider...

→ ACEi / ARB +/- SGLT2i in diabetes

→ ACEi / ARB +/- SGLT2i in all CKD

- ACEi / ARB if uACR > 30 and hypertensive
- ACEi / ARB if uACR > 70
- add on SGLT2i if uACR > 25

→ target ABP 130/80

- NICE: if uACR > 70
- ...but remember CVS risk is continuous

Lab monitoring in CKD

Monitoring CKD

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

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
GFR categories (ml/min/1.73 m²) Description and range	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+

Take-home messages

- edren.org
- rie.renaladvice@nhslothian.scot.nhs.uk
- interpret uACR in the clinical context
- proteinuria associated with (continuous) risk of death and ESKD
- uACR > 3 in diabetes = action
- uACR > 30 in non-diabetic CKD = action

Supplemental slides

C End-stage renal disease

