

## Chronic kidney disease in type 2 diabetes

Does an abnormal urine albumin-to-creatinine ratio need to be retested?

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the probability that an individual with a positive test result has the condition disease

FIRST URINE ACR RANGE, mg/mmol	PPV (95% CI), %
≥2 to <4	95.3 (92.6-98.0)
≥4 to <6	97.4 (94.6-100.3)
≥6 to <8	98.6 (96.0-101.3)
≥8 to <10	95.5 (89.3-101.6)
≥10 to <12	97.3 (92.1-102.5)
≥12 to <14	96.7 (90.2-103.1)
≥14 to <16	100.0 (100.0-100.0)
≥16 to <18	100.0 (100.0-100.0)
≥18 to ≤20	100.0 (100.0-100.0)
≥2 to ≤20	96.80 (95.37-98.21)

“multiple random urine ACR tests might not be necessary to diagnose patients with type 2 diabetes as having persistent microalbuminuria and CKD”

# ACR measurement variability

			% change from baseline in a clinically stable patient to be comfortable that there has been a change	
Baseline Albuminuria	24h albumin excretion	Baseline ACR	1 test +/-	Average of 2 tests +/-
Normal <30 mg/d	~30mg/d	3 mg/mmol*	~450%	~400%
Microalbuminuria 30-300 mg/d	~100 mg/d	10 mg/mmol	~175%	~150%
Macroalbuminuria >300 mg/d	~300 mg/d	30 mg/mmol	~80%	~70%
	~1000 mg/d	100 mg/mmol	~60%	~50%
Nephrotic >3,000 mg/d	~3000 mg/d	300 mg/mmol	~50%	~40%

\*multiply by ~10 for mg/g units

Kidney Failure Risk Equation - [qxmd.com](http://qxmd.com) -  
5 year risk dialysis/transplant based on age ACR and GFR

ACR	mg/mmoL or mg/g <3(27) norm/mild 3 (27) to 30 (270) mod >30 (270) severe	2/	30/	60/	2/	30/	60/	2/	30/	60/	2/	30/	60/
		27	270	530	27	270	530	27	270	530	27	270	530
eGFR mL/min/ 1.73 m <sup>2</sup>	60-89 mild 45-59 mild/mod 30-44 mod/sev 15-29 severe	80			60			45			30		
5 Year risk of dialysis or renal transplant (%)	50 y/o	<0.1	0.1	0.2	0.4	1	2	2	6	7	9	26	34
	60 y/o	<0.1	0.1	0.2	0.3	1	1	1	5	6	8	22	28
	70 y/o	<0.1	0.1	0.2	0.3	0.8	1	1	4	5	6	17	23
	80 y/o	<0.1	0.1	0.1	0.2	0.6	0.8	1	3	4	5	15	19

Cells are coloured based on CKD guideline definitions

Low	Moderate	High	Very High
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## 764 trials including 421,346 patients - up to Aug 2020

Changes in risk over 5 years	Mortality	CVD mortality	Non-fatal MI	Non-fatal stroke	Kidney failure (GFR <15 mL/min)	HF hospitalization
Primary prevention SGLT-2 vs placebo	1.5%↓ NNT = 66	0.7%↓ NNT=143	0.7%↓ NNT = 143	No difference	0.3%↓ NNT = 333	0.9%↓ NNT 111
Secondary prevention SGLT-2 vs placebo	2.5%↓ NNT=40	1.2%↓ NNT= 83	1.3%↓ NNT = 76	No difference	0.6%↓ NNT=166	2.3%↓ NNT =43
Primary prevention GLP-1 vs placebo	0.8%↓ NNT = 125	0.5%↓ NNT = 200	0.4%↓ NNT = 250	0.9%↓ NNT 111	0.2%↓ NNT = 500	No difference
Secondary prevention GLP-1 vs placebo	1.3%↓ NNT = 76	0.9%↓ NNT 111	0.8%↓ NNT = 125	1.6%↓ NNT =62	0.4%↓ NNT = 250	No difference
Primary prevention SGLT-2 vs GLP-1	0.7%↓ NNT = 143	No difference	No difference	0.9% ↑ NNH = 111	No difference	0.7%↓ NNT = 143
Secondary prevention SGLT-2 vs GLP-1	1.2%↓ NNT= 83	No difference	No difference	1.6% ↑ NNH =62	No difference	1.8%↓ NNT =55

### Cost

SGLT-2 ~ \$100/month

GLP-1 ~ \$200-300/month

**~15% more genital infections and 0.47kg greater weight loss with SGLT-2**

Little or no evidence was found for the effect of SGLT-2 inhibitors or GLP-1 receptor agonists on limb amputation, blindness, eye disease, neuropathic pain, or health related quality of life.