

Proteinuria in renal disease

Heavy proteinuria is characteristic of glomerular diseases. 'Nephrotic range' proteinuria (>3.0g/24h is one definition) is always glomerular. Proteinuria is also an important prognostic indicator for the progression of chronic renal damage.

Relating protein excretion to excretion of creatinine corrects for variations in urine concentration, and measurements of this ratio on single samples can in most circumstances substitute for 24h collections. The conversions shown here are approximately. Those with lower creatinine production will have a higher ratio for a given rate of protein excretion. This conversion assumes a daily creatinine excretion of approx 10 mmol - on the low side for muscular men.

ACR	PCR	Implication	Approx 24h equivalent
>2.5/3.5	>15	Abnormal (ACR values are for male, (female): adequate to define CKD 1 or 2.	150mg protein
30	50	Favour ACE inhibitor/ARB if hypertensive Commence ACEI/ARB if diabetic Suffix 'p' on CKD stage	0.5g
70	100	Stricter BP limits apply Referral threshold in non-diabetics	1g
>250	>300	Approximately 'nephrotic range' proteinuria	>3g

Note that up to 150mg/24h is normal and about 30mg of this is albumin. A concentration of about 150mg/l corresponds to 'trace' on a urine dipstick, and 300mg/l to 1+, but this is obviously affected by urine concentration/dilution.

As proteinuria rises, albumin forms a relatively larger proportion; about 50% at 300mg/l and 70% at 1g/l. So the referral threshold of 100mg/mmol is not very different for albumin and it may be simplest to quote the same.

Reducing proteinuria

Spontaneous or therapeutic reductions in proteinuria are in general good

prognostic indicators. Some therapies that reduce proteinuria (ACEI or ARB) have been shown to improve long term renal outcomes in randomized controlled trials. In approximately descending order of evidence

- ACEI or ARB
- Improved blood pressure control
- Simultaneous use of ACEI and ARB
- Addition of spironolactone
- Non-dihydropyridine calcium channel blockers
- Addition of other agents such as endothelin receptor antagonists, PPAR-gamma agonists, etc.

Further information

- [Proteinuria](#) - information for patients from [EdRenINFO](#)
- Management of proteinuria - guideline for management of proteinuria in primary care or other hospital specialities from GP Info
- [UK CKD eGuide](#) on proteinuria

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