Appendix 1:

Appendix 1: Recognising and Responding to Acute Kidney Injury for Adults in Primary Care

"Think" Cause	"Think" Medication#	"Think" Fluids	"Think" Review¥
History of acute Illness? • Think Sepsis • Think Hypotension Intrinsic kidney disease? (E.g. vasculitis) • Think Urinalysis Urinary tract obstruction?	Any medication which could **exacerbate** AKI? Consider withholding: • NSAIDs • Diuretics • Antihypertensive medication Any medication which may **accumulate** and cause harm during AKI? Any **new** medication that may **cause** AKI?(E.g. drug induced tubulo-interstitial nephritis)	What is the patient's volume status? If hypovolemia present: • When did patient last pass urine? • Can the patient increase fluid intake? • Is admission for IV fluid replacement and monitoring required? Does the patient have and/or need carer support?	Does the patient need acute admission? If not, when will you review? Have you ensured handover?

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Refer to medicines optimisation toolkit for primary care http://www.thinkkidneys.nhs.uk/aki/medicines-optimisation-for-aki

¥ Refer to overarching principles in communication of diagnostic test results https://www.england.nhs.uk/patientsafety/discharge

The table is a guide to support recognition and response to AKI in primary care
The table does not apply to children and young people (<18 years) or patients receiving end of life care

Appendix 2

Expressions of urinary protein concentration and their approximate equivalents and clinical correlates

	Dipstick reading	Urine protein: creatinine ratio, mg/mmol (PCR)	Urine total protein excretion, (g/24 hour)	Urinary albumin: creatinine ratio, mg/mmol (ACR)	Urinary albumin excretion, micrograms/min (mg/24 hour)
Normal	Negative	<15	<0.150	<2.5 (males) <3.5 (females)	<20 (<30)
Microalbuminuria	Negative	<15	<0.150	≥2.5 to 30 (males)	20-200 (30-300)
"Trace" protein	Trace	15-44	0.150–0.449	≥3.5 to 30 (females)	
Clinical proteinuria (macroalbuminuria)	1+	45-149	0.450-1.499	>30	>200 (>300)
	2+	150-449	1.50-4.49		
Nephrotic range proteinuria	3+	≥450	≥4.50		

Values in this table are based on an assumed average creatinine excretion of 10 mmol/day and an average urine volume of 1.5 l/day.

NB males and females have different thresholds for the diagnosis of microalbuminuria as a consequence of the lower urinary creatinine excretion in women.

There is no single value for the accurate conversion between ACR to PCR, however, at low levels of proteinuria (<1 g/day), a rough conversion is that doubling the ACR gives the PCR. At proteinuria excretion rates of >1 g/day, the relationship is more accurately represented by 1.3 × ACR = PCR.

Adapted from Joint Specialty Committee on Renal Medicine of the Royal College of Physicians and the Renal Association, and the Royal College of General Practitioners guideline Chronic kidney disease in adults.

Appendix 3

Advice for patients for prevention of recurrence of renal stones:

adapted from NICE Clinical Knowledge Summary on Renal or ureteric colic - acute

General advice if stone type unknown	Calcium stones	Uric acid stones	Mixed stones (both uric acid and calcium oxalate)
Adjust fluid to produce 2-3 l pf urine per day/ or maintain colourless urine	Avoid excessive dietary intake of oxalates: rhubarb, spinach, cocoa, tea leaves, nuts, soy products, strawberries, and wheat bran	Avoid excessive intake of urate rich products: liver, kidney, calf thymus, poultry skin, herring with skin, sardines, anchovies, sprats	Advice as per calcium and uric acid stones
Eat balanced diet with plenty of fruit and vegetables	Limit animal protein to 0.8-1g /kg body weight		
Reduce salt intake	Sodium – do not exceed 3g daily		
Maintain a healthy weight	Avoid calcium supplements (but not restrict dietary calcium)		
Avoid fructose containing soft drinking (can increase urate levels)			

Appendix 4

Differential diagnosis of Proteinuria (Patient.co.uk proteinuria)

Primary glomerular causes (ineffective barrier to the filtration of proteins)

- Focal segmental glomerulonephritis.
- IgA nephropathy (ie Berger's disease).
- IgM nephropathy.
- Membrano/ mesangioproliferative glomerulonephritis.
- Membranous nephropathy.
- Minimal change disease.

Secondary glomerular causes

- Alport's syndrome.
- Amyloidosis.
- Sarcoidosis.
- Drugs (eg, non-steroidal anti-inflammatory drugs (NSAIDs), penicillamine, gold, angiotensin-converting enzyme (ACE) inhibitors).
- Anderson-Fabry disease.
- Sickle cell disease.
- Malignancies (eg, lymphoma, solid tumours).
- Infections (eg, HIV, syphilis, hepatitis, post-streptococcal infection).

Tubular causes (failure of reabsorption of proteins in renal tubules)

- Aminoaciduria.
- Drugs (eg, NSAIDs, antibiotics).
- Fanconi's syndrome.
- Heavy metal ingestion.

Overflow causes (excess production of protein in the body)

- Haemoglobinuria.
- Multiple myeloma.
- Myoglobinuria.

Other causes (likely to have multiple pathologies)

- Pre-eclampsia/eclampsia.
- Diabetes Mellitus
- Connective Tissue Diseases
- Vasculitis
- Amyloidosis
- Myeloma
- Congestive Cardiac Failure
- Hypertension