ACUTE KIDNEY INJURY MANAGEMENT GUIDELINES

University Hospitals Plymouth NHS Trust

STEP 1: IDENTIFICATION OF AKI

The diagnosis of AKI requires a rise from the baseline creatinine **or** a fall in urine output **or** both

STAGE	SERUM [CREATININE]	URINE OUTPUT
1	rise of 26 µmol/L from baseline Cr within 48 hrs **OR** rise 1.5-1.9 x baseline Cr	<0.5 mL/kg/hr for > 6 consecutive hrs
2	rise of 2-2.9 x baseline Cr	<0.5 mL/kg/hr for > 12 hrs
3	rise of >3 x baseline Cr **OR** Cr > 354 µmol/L **OR** commenced on RRT	<0.3 mL/kg/hr for > 24 hrs OR anuria for 12 hrs

STEP 2: INITIAL ASSESSMENT OF A PATIENT WITH AKI

HISTORY & EXAMINATION

Focus on: vital signs (including trends; is the patient in shock?), fluid balance assessment, evidence of sepsis, other organ failure, medications, urinary & systemic symptoms (consider obstruction), PMHx (including baseline renal function).

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ALL patients	**Urine dipstick, MSU, urine protein : creatinine ratio, FBC, bone profile, LFT, CRP, clotting, ECG and CXR**
Consider in some patients	myeloma screen, glomerulonephritis screen (if blood & protein on dipstick; includes ANCA, ANA, C3, C4, anti-GBM Abs, RhF), haemolysis screen (e.g. if low platelet count; includes LDH, retics, blood film), ABG, CK level
Renal USS	**ONLY** indicated if obstruction or pyelonephritis are suspected or if pre-renal AKI is **not improving with appropriate treatment**

STEP 3: CONSIDER THE POTENTIAL CAUSES OF AKI

	SHOCK / 'PRE-RENAL'	INTRINSIC RENAL DISEASE	OBSTRUCTION	IATROGENIC
Diagnoses	Sepsis Haemorrhage Hypovolaemia / dehydration Cardiac failure Hepatorenal syndrome Renovascular insult	Glomerulonephritis / Vasculitis Tubulointerstitial nephritis Rhabdomyolysis Myeloma Haemolytic Uraemic Syndrome Malignant Hypertension	Bladder outflow Stones Tumours Extrinsic compression	Nephrotoxic drugs, e.g. NSAIDs ACEIs & ARBs, diuretics PPIs Antibiotics Iodinated XR contrast
Hallmark features	Intravascular hypovolaemia Dehydration Features of SIRS	Blood +/- protein on urine dip Systemic symptoms	Anuria Pain Haematuria	Temporal relationship between rising Cr and drugs Eosinophilia

STEP 4: ASSESS FOR THE POTENTIAL COMPLICATIONS OF AKI

HYPERKALAEMIA

All patients require an ECG

Level	ECG changes?	Treatment
6.1 – 6.4	No	Treat AKI and monitor potassium (only treat potassium if there are ECG changes)
6.5 – 6.9	No	Insulin and Dextrose
6.5 – 6.9	Yes	Calcium gluconate, Insulin and Dextrose
> 7.0	Irrelevant	Calcium gluconate, Insulin and Dextrose (consider early referral)

REFER TO TRUST GUIDELINES FOR HYPERKALAEMIA

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ACIDOSIS

If serum bicarbonate < 23mmol/L and the patient is not fluid overloaded, consider including 1.26% sodium bicarbonate solution as part of fluid resuscitation, especially if hyperkalaemic.
If pH < 7.2, consider early discussion with renal and/or critical care teams.

PULMONARY OEDEMA

Manage the patient sitting up. Give high flow O_2 unless contra-indicated.
If haemodynamically stable, consider intravenous frusemide and/or GTN infusion.

URAEMIA

Airway management if obtunded. Monitor for seizures. Consider pericarditis.

CONSIDER EARLY REFERRAL TO RENAL & CRITICAL CARE TEAMS FOR PATIENTS WITH COMPLICATIONS OF AKI

STEP 5: INSTIGATE EARLY MANAGEMENT OF AKI

ADDRESS FLUID BALANCE

Initial fluid resuscitation (unless intravascularly replete) to achieve euvolaemia: this requires frequent fluid balance assessments. **Then consider maintenance fluids**: consider sensible/insensible losses and electrolyte requirements.

SUPPORT

Undertake thorough medication review. Consider antibiotics (if sepsis is suspected).

MONITORING

Institute appropriate physiological observations monitoring plan (minimum 4 hourly) including urine output (consider catheter). Daily weights. Consider twice daily blood tests until creatinine is improving.

STEP 6: DISCUSSION WITH / REFERRAL TO RENAL OR ICU TEAMS

Contact the On-Call Renal Registrar (available 9-5pm weekdays on pager 81013) or Renal Consultant On-Call (at any time) urgently via switchboard. The AKI Nurse pager is 81174.

- All patients with Stage 3 AKI
- All patients with AKI and blood and protein on urine dip
- All patients with AKI associated with new or poorly controlled hypertension
- AKI with complications (high K, acidosis, oedema etc) where imminent recovery is unlikely, or complications are severe and/or refractory to Rx, and dialysis may be required.

Patients with obstruction should also be discussed with urology.

Haemodynamically unstable patients should be discussed with the intensive care team.

Trust Guidelines

University Hospitals Plymouth NHS Trust

Guidance Title: Acute Kidney Injury Management Guideline

Issue Date	Version
February 2022	1.5

Accountabilities	
Author	Dr A Connor
Reviewed by (Group)	Renal Clinical Governance meeting
Approved by (Lead)	Chair of Renal Clinical Governance meeting

Links to other documents

Version History		
1.0	January 2015	Guideline issued
1.1	January 2017	Guideline reviewed - unchanged
1.2	July 2017	Minor amendment
1.3	October 2018	Guideline reviewed - typographical error corrected
1.4	June 2020	Guideline reviewed - bleep numbers updated
1.5	February 2022	Guideline reviewed – no changes required

Last Approval	Due for Review
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