

Department of Health Research Ministry of Health and Family Welfare, Government of India



Standard Treatment Workflow (STW) for the Management of

ACUTE KIDNEY INJURY

ICD-10-N17.9

SYMPTOMS

- · Reduced urine output
- Dark, concentrated urine
- Swelling over feet/face
- Breathlessness

PRELIMINARY ACTIONS

- Monitor urine volume & body weight
- Identify and treat life-threatening complications
- Correct hydration status
- Stop nephrotoxic drugs
- Exclude urinary outlet obstruction
- Stabilize blood pressure
- Treat infection
- · Assess for dialysis need

LOOK OUT FOR AKI IN THE **PRESENCE OF**

- Hypotension
- · Volume loss (eg: vomiting, diarrhea, bleeding); heat exposure or heat stroke
- · Pregnancy-related complications
- Multiple organ failure
- Nephrotoxic medication use
- In neonates oligohydramnios/ birth asphyxia, respiratory distress

DESIRABLE ACTIONS/INVESTIGATIONS

- Stage AKI (KDIGO criteria*)
- Check electrolytes, acid-base status
- Urinalysis
- Rule out pre-existing kidney disease
- Ultrasound of KUB region
- Assessment for infection

AKI IN SPECIFIC SETTINGS

· Neonatal - refer to paediatrician Pregnancy - manage complications

Laboratory investigation for specific cause

PRINCIPLES OF ASSESSMENT

- Determine whether pre-renal, renal or post-renal
- Identify and correct reversible
- · Look out for occult causes (e.g. envenomations, poisoning)
- Determine severity of AKI
- Identify complications · Decide need for dialysis

· Poisoning - specific antidote when available Systemic disease - refer for investigations

• Envenomations - antivenin, hemodynamic

- · Kidney transplant recipient refer to
- nephrologist

TREATMENT OF HYPERKALEMIA

- · Calcium gluconate 1000 mg slow IV under ECG monitoring, can be repeated upto 3 times
- · Salbutamol: 10 to 20 mg in 4 mL of saline by nebulization
- Insulin-dextrose: 10 to 20 units of regular insulin in 100 ml 25% or 50% dextrose

MANAGEMENT

PRIMARY CARE

- · Detailed history and physical examination
- · Identify and correct volume deficit

WHAT IS AKI?

Increase in Serum

creatinine by >0.3

mg/dl in 48 hours

AND/OR Urine

output <0.5 ml/kg/h

for 6-12 hours

- Stop nephrotoxic agents · Identify and correct bladder outlet
- obstruction · Give anti-snake venom if indicated
- Identify hyperkalemia and start treatment
- · Identify pulmonary edema- start intravenous furosemide and oxygen
- PD if indicated
- · Timely referral after stabilisation

SECONDARY CARE

- · Detailed history and physical examination
- · Identify and correct volume deficit
- Stop nephrotoxic agents Identify and treat hyperkalemia, metabolic acidosis and pulmonary edema
- Identify and correct urinary tract obstruction (USG, CT)
- Detailed investigation for infections
- · Manage pregnancy complications deliver if indicated
- · Look for underlying CKD
- · Dialysis (PD or HD)

TERTIARY CARE

- Detailed history and physical examination
- · Identify and correct volume deficit
- Stop nephrotoxic agents
- · Identify and correct urinary tract obstruction (USG, CT scan)
- · Identify and treat hyperkalemia, metabolic acidosis and pulmonary oedema
- Detailed investigation for infections
- · Manage pregnancy complications- deliver if indicated
- · Look for underlying CKD
- · Investigations for specific cause (including imaging, genetic tests)
- Kidney biopsy
- · Dialysis (PD or HD)

RED FLAGS FOR URGENT REFERRAL

- Indications for dialysis
- Unexplained AKI
- Involvement of other organs
- Systemic disease Complicated pregnancy
- Sepsis

INDICATIONS FOR DIALYSIS

- Fluid overload
- Pericarditis
- Hyperkalemia Severe metabolic acidosis
- Encephalopathy
- · Severe uraemia
- To create space for fluids or blood products

FOLLOW-UP OF AKI

- UO > 1L, stable or falling creatinine, no symptoms: stop
- Not resolving for >2 weeks: CECT to exclude cortical necrosis; kidney biopsy as indicated
- · Look for systemic diseases (e.g. vasculitis, myeloma,
- Serum creatinine and urine protein q 6-12 months for life

ABBREVIATIONS

AKI: Acute Kidney Injury **CECT:** Contrast-enhanced CT scan

PD: Peritoneal dialysis **TMA:** Thrombitic microangiopathy

CKD: Chronic Kidney Disease **HD:** Hemodialysis

UO: Urine output **USG:** Ultrasonography

REFERENCE

*KIDNEY DISEASE: Improving Global Outcomes (KDIGO) Acute Kidney Injury Work Group. KDIGO Clinical Practice Guideline for Acute Kidney Injury. Kidney Int, Suppl. 2012; 2: 1-138

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES