Acute renal failure Algorithm
Please review definition and pathophysiology

Assess for the presence of major risk factors:
Advancing age with CHF, DM HTN

<table>
<thead>
<tr>
<th>Pre-renal:</th>
<th>Intra-renal</th>
<th>Post-renal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dehydration</td>
<td>Acute tubular necrosis (ATN)</td>
<td>Obstructive uropathy; Ureteral, bladder outlet</td>
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<tr>
<td>Hypovolemia</td>
<td>Autoimmune kidney disease; SLE.</td>
<td>Prostate gland disorders</td>
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<tr>
<td>Sepsis</td>
<td>Diabetic nephropathy</td>
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<tr>
<td>Hemorrhage</td>
<td>Hypertensive nephropathy</td>
<td></td>
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<tr>
<td>Burns</td>
<td>Infections</td>
<td></td>
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<tr>
<td>Trauma</td>
<td>Hemolytic uremic syndrome</td>
<td></td>
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<tr>
<td>Serious illness and surgery</td>
<td>Nephrotoxins; contrast dye</td>
<td></td>
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<tr>
<td>Low cardiac output syndromes</td>
<td>ITP</td>
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</tbody>
</table>

Are Risk Factors Present?

YES

Screening urine for microalbinemia if compelling med history is present; HTN, DM, autoimmune disease, etc

Assess for s/s of ARF:
• Decreased urine output; Nocturia
• Swelling/edema
• Weight gain
• s/s of fluid overload; CP, SOB
• hypotension, hypertension

Are positive findings present?

POSITIVE

Initiate client education for Health Seeking Behaviors to identify:
• Don’t abuse alcohol or drugs especially OTC drugs that have a nephrotoxic profile
• Avoid long-term exposure to heavy metals, such as lead, as well as to solvents, fuels and other toxic substances.
• Ensure adequate hydration
• Use appropriate hygiene to reduce risk of infections
• Encourage routine disease screening and periodic physical exam according to risk profile
• Instruct client in s/s of risk factors to report
• Teach client s/s of acute renal failure to report

Follow plan of care for PC: ESRD

NO

Are Risk Factors Present?

NO

Initiate the plan of care for a Risk for Ineffective Therapeutic Regimen management:
• Teach client about course and progression and the potential complication of ESRD if ARF is not corrected
• Explain diagnostic testing if indicated definition and interpretation of results; bloodwork such as creatinine, and calculation of GFR; urine testing such as creatinine clearance and microalbumin, kidney radiographic procedures; IVP, KUB, renal ultrasound, CT scanning, biopsy
• Assist client in strategies to reduce modifiable risk factors
• Teach client strategies to protect kidney from injury, nephrotoxin avoidance (radio contrast agents, aminoglycosides, NSAIDs) and infection protection
• Instruct in use of medications for acute and chronic use; dopamine for decreased perfusion, ACE inhibitors for nephroprotection
• Review diet and hydration according to disease state, discuss lower protein, sodium and potassium as ESRD develops
• Review renal replacement therapies in the presence of ESRD or unresponsive ARF; indications and considerations such as hemodialysis, peritoneal dialysis and transplantation
• Patient teaching from box 1

Box 2
### OUTCOMES/BENCHMARKS:

- Urine output > 30 ml/hr
- Creatinine and GFR WNL for age, no microalbuminuria
- No edema, weight gain, s/s of fluid overload such as DOE; SOB,
- 140>SBP> 100, 100>HR> 60 no dysrhythmia

### PC: ESRD

<table>
<thead>
<tr>
<th>ASSESS s/s of renal failure</th>
<th>MONITOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Decreased urine output; Nocturia</td>
<td>Monitor for hypo/hypertension, tachycardia, tachypnea,</td>
</tr>
<tr>
<td>• Swelling/edema</td>
<td>Monitor hourly I/O for urine output &lt; 30 ml/hr</td>
</tr>
<tr>
<td>• Weight gain</td>
<td>Monitor for rising serum BUN &amp; creatinine</td>
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<tr>
<td>• s/s of fluid overload; CP, SOB</td>
<td>Monitor urine for presence of protein</td>
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<tr>
<td>• Hypotension, hypertension</td>
<td>Monitor daily weights</td>
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Assess for contributing factors:

- Pre-renal. Intra-renal and post renal

### DO

Protect kidney from further harm

- Discontinue or adjust any medications that require adjustment for renal dosing
- Relieve obstructive uropathy
- Control autoimmune exacerbation

Ensure adequate renal tissue perfusion

- Reversal of hypovolemia by rapid fluid infusion often is sufficient to treat many forms of ARF. Monitor for fluid overload
- Administer prescribed diuretics to promote urine output if indicated and dopamine agents by IV infusion to ensure renal perfusion as ordered and monitor effect

Prevent electrolyte and acid base disturbances:

- Avoid agents that exacerbate hyperkalemia and hypernatremia
- Renal replacement therapy may be required

Provide renal replacement therapy as ordered and monitor effectiveness

- Acute H/D, PD, and CVVHD

### CALL

Call for refractory increased urine output and hemodynamic instability

Initiate ABC, shock management and call ready response team and MD

- Acute H/D, PD, and CVVHD