Academic Half Day – Acute Kidney Injury
Facilitator Guide

Agenda
1:00-2:25pm Cases
2:25-2:30 Expert questions

Case 1

Mr. Reno is a 67-yo male with history of HTN, obesity, diabetes mellitus type II complicated by neuropathy, and prostate cancer presents to the ED with 2 days of fever, shaking chills, right lower quadrant abdominal pain, nausea, and vomiting.

Medical History:
DM2 (HgA1c 7.0)
HTN
Prostate Cancer s/p radiation 2 years ago

Home Medications:
Metformin
Atorvastatin
Glyburide
Gabapentin
Lisinopril
HCTZ
Aspirin

Physical Exam:
VS: T 102.0, HR 111, BP 100/62, RR 18, SpO2 97% on RA, Weight 220lbs
GEN: Ill-appearing and diaphoretic, no respiratory distress.
HEENT: Mucous membranes are tacky.
CV: Tachycardic, normal S1 and S2, no murmurs, flat neck veins
Pulmonary: Normal respiratory effort, CTAB, no wheezes, crackles or rhonchi
Abd: normal BS, soft, RLQ tenderness is present, but no rebound or guarding. Right CVA tenderness is present.
GU: Normal prostate, no enlargement or nodules
Ext: Warm, no rashes, no edema

1. **What is your differential diagnosis and how would you support this with information from the history and exam?**

2. **What labs and/or imaging studies would you order on this patient and why? Consider how each test would potentially change your management.**

3. **What is your differential diagnosis now and how would you support this with your history, physical AND supplemental data?**

4. **What are the definitions of the stages of AKI based on KDIGO?**

Stage	Creatinine Criteria	UOP Criteria
1		
2		
3		

5. **What kind of renal injury does this patient have? How do you decide this? What is the pathophysiology?**

6. **Where would you admit this patient? What is your initial management?**

7. What would your cross-coverage sign-out for the night team say?

Over the next 48 hours, Mr. Reno is looking better.
Physical Exam:

VS: 98.6F, 94, 18, 140/84, 97% RA, Weight 224lbs
GEN: no acute distress, appears comfortable
CV: RRR, no murmurs
Pulmonary: CTAB, no wheezes, crackles or rhonchi
Abd: normal BS, soft, non-tender except for right CVA tenderness (improved from admission)
Ext: Warm, no rashes, no edema

8. Would there be any labs you would follow and why?

You are called later that evening by the RN who says, "Mr. Reno has not had any urine output this shift." He is now complaining of worsening abdominal pain. The rest of his vitals have normalized.

9. What is the differential for this lack of urine output? Is there anything else you would ask or do?

Case 2
A 45 y/o M with history of HTN, HLD, depression, and DM II is evaluated in the emergency department after being found down.

Physical Exam:
AF, BP 142/92, HR 115, RR 25, and SpO2 97% on RA
GEN: Obtunded
CV: Tachycardic, normal S1 and S2, no murmurs or rubs
Pulmonary: Tachypneic, but otherwise normal work of breathing. CTAB, no wheezes, crackles or rhonchi

Abd: normal BS, soft, non-tender
MSK: Warm, no rashes, no edema
Neuro: opens eyes to pain, withdraws to pain, inappropriate words

1. What is your initial approach to further differentiating this patient? What labs do you want?

Lab Results:	
136 | 100 | 28 / ---------- 90 4.0 | 12 | 2.2 \\ Baseline cr: 0.8	Ethanol: undetected Serum osms: 314 ABG: 7.25/28 Urinalysis: crystals are present. See QR Code. *Calcium oxalate crystals are seen here. Monohydrate are dumbbell shaped and can be needle-like. Dihydrate are envelope shaped.* *Cool note: Urine will fluoresce under Wood's lamp if the patient drank ethylene glycol (because of the blue dye!)*

Urinalysis

2. What is the acid base disturbance in this patient?

3. **What is the management of this patient?**

Case 3

A 56 y/o male with no significant medical history is coming in for persistent fever, chills, sore throat, and myalgias for the past 3 days. He went to the ER 14 days ago for chest pain, so he got a CT chest with IV contrast, which was negative for PE. At that time, his kidney function was normal. He was discharged with ibuprofen 400 mg Q6H PRN for pain. Two days after the ER presentation (12 days ago), he went to his PCP because he was feeling unwell. He received amoxicillin and has been taking it since. His repeat renal panel at the PCP was still normal.

He reports no change in urine.

Physical Exam:
101.5 F, BP 125/72, 75 BPM, 100% on RA, and RR 12
GEN: Well- appearing
HEENT: unremarkable
CV: RRR, no murmurs
Pulmonary: CTAB, no wheezes, crackles or rhonchi
Abd: normal BS, soft, non-tender
MSK: Warm, no edema, diffuse maculopapular rash

Lab Results:	Learners are given the labs for this case.
Renal Panel	134 | 106 | 46 / ---------- 96 4.7 | 24 | 3.8 \ Baseline cr: 0.9
CBC	WBC 12.5 / Hgb 11 / Hct 33% / PLT 216
Urinalysis	SG 1.010, Protein 2+, Blood negative, Glucose negative Micro: 3-5 RBCs, 20-25 WBCs, and a cast (see QR code)

1. **What is the differential diagnosis? What do you think is most likely, why? What caused it?**

2. **What are other etiologies?**

3. **How would you manage this patient's AKI?**

Case 4

A 35-yo male was found down by a bar one summer night. It's unclear when he was last seen. After naloxone and initial resuscitation he is alert and oriented and appears to have no significant injuries. Due to discomfort with ambulation the ED placed a foley and his collection bag shows a small amount of urine that looks concentrated and a reddish tinge. On admission his BP 120/70 and HR 80. Exam is normal except for difficulty with active movement and muscle tenderness along right side.

1. **What is on your differential diagnosis based off history? What else would you like to know? Are there labs you'd like to obtain?**

Lab Results:	Learners are NOT given the labs for this case.
Renal Panel	132 | 103 |22 / ---------- 194 5.3 | 19 | 4.2 \
Urinalysis	SG 1.030, Leuk Esterase Neg, Blood large, Protein 2+ Micro: WBC Neg, RBC 0-1
Urine Lytes	FeNa 3.5% FeUrea 56%

2. **What is your differential now? Support this with the information you have.**

2. What other disease scripts or presentations might present with this type of renal injury? What are complications you need to watch for?

3. In this patient, what is the mechanism(s) of acute kidney injury?

4. How will you initially manage this patient?