

[Test Your Knowledge: Pain](#)

[NephMadness 2019](#) featured the **Pain** region. Whenever we consider giving a medication for pain, we must weigh the potential benefits against the potential harms. Test your knowledge on pain management in patients with kidney diseases with the quiz* below.

1. A 47-year-old man with CKD stage 4 from diabetes mellitus presents to the ER with acute severe left leg lower leg pain after a significant fall. He is found to have a tibial shaft fracture. He currently rates his pain a 9/10. Which of the following would be the best initial choice for acute pain management?
 - A. Ketorolac
 - B. Morphine
 - C. Hydromorphone
 - D. Codeine

2. A 47-year-old woman with ESKD on hemodialysis and rheumatoid arthritis presents with worsening arthritis symptoms. She is currently on hydroxychloroquine for her rheumatoid arthritis. She is completely anuric. If an NSAID is added to her regimen, which of the following complications is she most likely to have?
 - A. Worsened edema
 - B. Hyperkalemia
 - C. Hypertension
 - D. GI bleeding

3. A 63-year-old man with ESKD on in-center hemodialysis was brought in to the emergency department by his wife with increasing sedation over the last two days. He has not missed any recent hemodialysis treatments; his last treatment was 2 days ago. He has not had any other symptoms. His medications include sevelamer, carvedilol, lisinopril, and baclofen, which was started 1 week ago for muscle spasms. He takes no over-the-counter medications and is not known to use illicit drugs. On exam his blood pressure is 110/64 mm Hg and heart rate is 59 beats per minute. He is obtunded and only responds to sternal rub. He has no facial asymmetry. His deep tendon reflexes are reduced in all extremities. His exam is otherwise unremarkable. His lab findings are unremarkable. What is the most likely cause of his altered mental status?
 - A. Uremic encephalopathy
 - B. Heroin overdose
 - C. Acute stroke
 - D. Baclofen neurotoxicity

4. A 57-year-old woman with ESKD on hemodialysis presents complaining of worsening osteoarthritis pain in her knees and hands. She has been on a stable dose of tramadol for 2 years for her arthritis. She also takes cinacalcet 30 mg per day (started 1 month ago), sevelamer 1600 mg with meals, and lisinopril 40 mg per day. What is the most likely reason for her worsening pain?
- A. Decreased metabolism of tramadol to its active metabolite
 - B. Increased inactivation of the active metabolite of tramadol
 - C. Worsening of her underlying osteoarthritis
 - D. Increased tolerance to tramadol

- Quiz prepared by [Anna Burgner](#), NephMadness Executive Team and AJKD Social Media Advisory Group Member. Follow her [@anna_burgner](#).

To view the full [Pain](#) region (FREE), please visit [AJKDBlog.org](#).

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Writer: David Juurlink

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[Answers to Test Your Knowledge: Pain](#)

1. A. Hydromorphone

The patient has CKD stage 4 and acute severe pain. Ketorolac should be avoided given the severity of his CKD due to the risk of worsening kidney function. Codeine and morphine should be avoided due to the risk of accumulation of the morphine-6-glucuronide metabolite that is biologically active. Hydromorphone is a good choice for severe pain and does not have a biologically active metabolite.

Reference:

Pham, P.C., Khaing, K., Sievers, T.M., et al. 2017 update on pain management in patients with chronic kidney disease. *Clin Kidney J* 2017; 10(5): 688-97.

2. D. GI bleeding

Without an intact, functioning, distal tubule (i.e. an anuric dialysis patient), the main prostaglandin effects on the kidney of hyperkalemia, hypertension, edema cannot occur. However, NSAIDs effects on the gastric mucosa still exist.

References:

(1) Jankovic, S.M., Aleksic, J., Rakovic, S., et al. Nonsteroidal antiinflammatory drugs and risk of gastrointestinal bleeding among patients on hemodialysis. *J Nephrol* 2009; 22(4): 502-7.

(2) Kurella, M., Bennett, W.M., and Chertow, G.M. Analgesia in patients with ESRD: a review of available evidence. *Amer Jour of Kidney Dis* 2003; 42(2): 217-228.

3. D. Baclofen neurotoxicity

Baclofen is excreted by the kidneys. Neurotoxicity is not uncommon in patients with reduced renal function and can progress to coma in patients with ESRD.

References:

Khazneh, E., Shamlawi, A., Jebrin, K., Hamdan, Z., and Sawalmeh, O. Single-dose baclofen-induced neurotoxicity in a patient with end stage renal disease: case report. *BMC Nephrol* 2018; 19(1): 352.

4. A. Decreased metabolism of tramadol to its active metabolite

Tramadol itself is a very weak opioid agonist and it needs to be metabolized to its M1 metabolite for effective analgesia. Tramadol requires the CYP2D6 enzyme for this. Cinacalcet is a strong inhibitor of CYP2D6; in this case, it was recently started and has caused decrease in the amount of M1 present and thus less analgesia.

References:

(1) Padhi, D. and Harris R. Clinical pharmacokinetic and pharmacodynamic profile of cinacalcet hydrochloride. *Clinical pharmacokin* 2009; 48(5): 303-11.

(2) Lassen, D., Damkier, P., and Brøsen, K. The pharmacogenetics of tramadol. *Clinical pharmacokin* 2015; 54(8): 825-836.

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