2025-01 Trial Exam

SAQ 14

You are looking after a 24 year old male with an isolated mid-shaft femoral fracture following a motor vehicle crash. He is haemodynamically stable and has no other injuries.

His only past history is opiate use disorder for which he takes buprenorphine 16mg once daily. He is on no other medications and has no known allergies.

Use the information in the stem to guide your approach to answers.

You are given the diagnosis, plus told there are no other injuries and that he is stable. You can take these as factual.

Also told he is otherwise well and has no CI to any drugs you may wish to give.

a) What is the pharmacological mechanism of action of buprenorphine? (1 mark)

Buprenorphine is a partial agonist for opiate mu receptors. It has high affinity and low efficacy for mu receptors.

It's also an antagonist at kappa and delta opiate receptors.

You had to say partial and opiate receptors to score.

The particularly high affinity for the receptor with less activity than other opiates, allows it to be used for OUD and allow safety as it is very hard to overdose on it.

I know this is sort of primary exam knowledge but the mechanism is really important as to why it is used.

He is in considerable pain from his injury.

b) State two non- pharmacological analgesia strategies that could be used (2 marks)

I required immobilisation as one of the answers to receive full marks. This could be stated as immobilised or splinted (e.g. Donway splint, skin traction etc)

Others answers- # Reduction, Distraction, relaxation/mindfulness, acupuncture, Ice etc. Any appropriate answer was acceptable.

Tip-
Be careful with reading the Q. States “non-pharmacological” so blocks did not score.

Two forms of immobilisation - splint plus traction, did not score more than once as the same category.

c) List six (6) parenteral non-opiate pharmacological analgesic strategies (including route and dose) for this patient (6 marks)

Note the words “parenteral” and “non-opiate”. So oral/PR meds not accepted. Nor were opiates even atypical such as tapentadol

Femoral N block, paracetamol IV, and Ketamine required for full marks.

Others would include ketorolac, clonidine, dexmedetomidine, Droperidol, lignocaine IV, Inhaled methoxyflurane (Penthrane) etc etc

To get a full mark per answer you needed the correct route and a reasonable dose. 1/2 mark for the drug only.

Be careful with doses -One person gave a clonidine dose in mg rather than micrograms. This is a deadly error and means zero points for the section. If you don't know then better to leave off the dose- at least you get 1/2 mark rather than losing up to 6.

Two routes of ketamine will only score once. Two drugs of the same class (e.g. NSAID) will only score once.

d) Outline and explain your opiate analgesic regime. (2 marks)

It’s 2 marks -> need more than just the drug.

1 mark for a reasonable drug and dose regime.

1 mark for a comment/justification e.g. higher than normal dosing may be required, and/or titration with frequent monitoring of efficacy and for side effects

This patient is likely to need high doses given the incredibly painful injury and partial antagonism of buprenorphine. So giving ordinary doses or any oral meds in this answer did not score (e.g. 5mg Endone QID)

e) Outline a modification of his buprenorphine regimen that could be used to improve its analgesic efficacy in this situation (1 mark)

Ideal answer is to increase the dose and give it every 4, 6 or 8 hours (rather than daily).

Half mark for increased dose, and half for increasing the frequency.

Changing the route did not score. Many people said to change it to SL- but daily buprenorphine is already SL. Norspan is not used for OUD.

The question was specifically about buprenorphine, so talking about other drugs did not score.

General hints

Read and answer the question asked

Don’t give excluded answers

- Don’t give opiates when it asks for non-opiates
- Don't give oral meds when it asks for parenteral
- Don’t give drugs when it asks for non-pharmaceutical strategies.

General hints

Always answer the questions based on the stem

- Very painful condition
- Opiate use disorder patient

Avoid answers that are too similar / from the same category

- Two types of immobilisation
- Two routes of admin for the same drug

Marks

- Cut mark- 7/12
  - A=1, b=1, c=4, d=1, e=0
- Range of marks 1.5-10
- Mean score 6.8, median score 7.3
- 20/38 scored ≥7

Parts of the Q were hard. But, opiate use disorder is an increasingly prevalent issue, and we will see more and more people on buprenorphine therapy. You should have an approach to it.

You should have a multi-modal strategy for analgesia in very painful conditions.

Resources

- EM:RAP -Analgesia in Patients on Buprenorphine. July 29, 2024
- CA Bridge *Acute Pain Management in Patients on Buprenorphine (Bup) Treatment for Opioid Use Disorder*