CLINICAL PROBLEM SET # 17

Patient
Female, 52 years old
Chief Complaint
"I know you wanted me to come sooner and have my bad teeth removed, but I am a pain wimp. And, I do not want dentures. This tooth on the left is so painful, and I have already taken six Tylenol pills. Please give me lots of narcotics..."
Background and/or Patient History
Atrial Fibrillation (A-fib) Renovascular Hypertension Dental Phobia Medications: Sotalol Valsartan Warfarin (Coumadin®) Acetaminophen (Tylenol®)
Current Findings
Rampant caries in patient's remaining dentition. None of the remaining 16 teeth are restorable. Acute pulpitis in #19. Temp: 99.5 F BP: 128/78 mmHg HR: 62 bpm, irregular

1. How would you manage this patient's acute pain needs? Would you prescribe opioids that she is asking for? If so, what is the basis for such decision? Are there any alternatives?

2. The patient is in pain despite taking Acetaminophen. How efficacious do you expect Acetaminophen to be for this condition?

3. Why is this patient taking Warfarin? If the doctor prescribed an NSAID instead of an opioid, what mechanisms of interaction between the NSAID and Warfarin do you expect? Please list at least three. What would be the clinical consequence of each interaction if Warfarin dose remained unchanged?

4. What other drug interactions with NSAIDs do you expect in this patient?

Characteristic properties of local anesthetics include all of the following, EXCEPT:

Blockade of voltage-dependent sodium channels	A
Effects on vascular tone	B
Preferential binding to closed (resting) channels	C
Inhibition of axonal impulse conduction	D
Depression of Central Nervous System (CNS) neurons	E

Answer: C

The preferentially bind open channels
B: most cause vasodilation except cocaine

The most important effect of inadvertent intravenous administration of a large dose of lidocaine is:

Bronchoconstriction	A
Methemoglobinemia	B
Renal failure	C
Seizures	D
Tachycardia	E

Answer: D

A: vasodilation/bronchodilation
E: direct effect is actually bradycardia, lidocaine is class1 anti-arrhythmic drug and anti-arrhythmic drugs decrease excitability

All of the following factors influence the action of amide local anesthetics, EXCEPT

Acetylcholinesterase activity in the region of the injection site	A
Blood flow through the tissue in which the injection is made	B
Dose of local anesthetic injected	C
The use of vasoconstrictors	D
Tissue pH	E

Answer: A

Its amide, not ester

LA-A is 55% plasma protein-bound, and LA-B is 95% plasma protein-bound. Relative to LA-A, LA-B is expected to have:

Higher risk of cardiotoxicity	A
Longer duration of action	B
Lower potency	C
Shorter plasma half-life	D
Shorter time for onset	E

Answer: B

A: higher protein binding means more likely to stay in circulation and not go to the heart

pKa of LA-A is 8.2, and pKa of LA-B is 7.6. Relative to LA-A, LA-B is expected to be:

More ionized and thus more easily membrane permeable in the extracellular pH of 7.4	A
More ionized and thus poorly membrane permeable in the extracellular pH of 7.4	B
Less ionized and thus more easily membrane permeable in the extracellular pH of 7.4	C
Less ionized and thus poorly membrane permeable in the extracellular pH of 7.4	D
Less than 50% ionized and thus poorly membrane permeable in the extracellular pH of 7.4	E

Answer: C

pKa closer to pH = less ionized and more membrane permeable

Final Exam:
50 questions total, each worth 2 points, i.e., max. 100 points available.
2-4 questions per 2-hr session (lecture + clinical problem set/small group)
- 40 questions (80%) – Must Know (Understand & Show Ability to Apply)
- 10 questions (20%) – Integrative (Show Ability to Analyze & Evaluate)

75% correct (38 questions – 76 points) - required to pass the exam
85% correct (43 questions – 86 points) – required to become eligible for an LOC
but
92% correct (46 questions – 92 points) – required to receive an LOC

Milestone Quizzes (MQ):
20 questions total, each worth 0.4 point, i.e., max. 8 points available.

The minimum requirement for an LOC:
46 exam questions answered correctly - no MQ lifeline needed
or
43-45 exam questions answered correctly
+
at least 15 (6 points; 75%) MQ questions answered correctly

Among NSAIDs, Aspirin is unique because it:

Reduces fever	A
Inhibits platelet aggregation	B
Selectively inhibits the COX-2 enzyme	C
Reduces inflammation	D
Irreversibly inhibits its target enzyme	E

Answer: E

Acetylation that is irreversible
A: not unique to aspirin
B: NSAIDs block COX to block prostaglandin synthesis which inhibits platelet aggregation
C: aspirin is 100 times more selective for COX1 than COX2
D: all NSAIDs do this

Which of the following is an analgesic and antipyretic drug that lacks an anti-inflammatory action?

Acetaminophen	A
Ibuprofen	B
Celecoxib	C
Aspirin	D
Apixaban	E

Answer: A

C: selective COX2 inhibitor (only one left on market)
E: apixaban (Xa factor 10 inhibitor) is anti-coagulant

Celecoxib is a selective COX-2 inhibitor. Which of the following would be the reason for avoiding Celecoxib?

Alcohol abuse	A
Gout	B
History of myocardial Infarction	C
Osteoporosis	D
Peptic ulcer disease	E

Answer: C

A: actually better than aspirin for alcohol abusers because it only inhibits COX2, aspirin with alcohol has bleeding issues
B: it is actually used for treatment of gout
D: it inhibits osteoclasts
E: actually protects stomach

Genetic polymorphisms in hepatic enzymes involved in drug metabolism are responsible for variations in analgesic response to:

Buprenorphine	A
Codeine	B
Fentanyl	C
Methadone	D
Tramadol	E

Answer: B

Its gets to more active morphine

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4. What other drug interactions with NSAIDs do you expect in this patient?

The best therapies that can be offered to this patient:

1-Opioids; 2-NSAIDs, 3-Acetaminophen; 4- Local Anesthesia and Pulpectomy/Extraction	A
1- Opioids; 2- Local Anesthesia and Pulpectomy/Extraction; 3-Acetaminophen; 4-NSAID	B
1-NSAID; 2-Opioid; 3-Local Anesthesia and Pulpectomy/Extraction; 4-Acetaminophen	C
1-NSAID; 2- Local Anesthesia and Pulpectomy /Extraction; 3-Acetaminophen; 4-Opioid	D
1- Local Anesthesia and Pulpectomy/Extraction; 2-NSAID; 3-Opioid; 4-Acetaminophen	E

Answer: E

Opioids actually have very little use in dentistry, usually as a combination drug
Pain will be blocked but inflammation will not be taken care of
The patient should reduce warfarin
They are already taking acetaminophen so if it is not working you try opioids before acetaminophen

In ONE WORD: Why is this patient taking Warfarin?

Anti-coagulation for a-fib

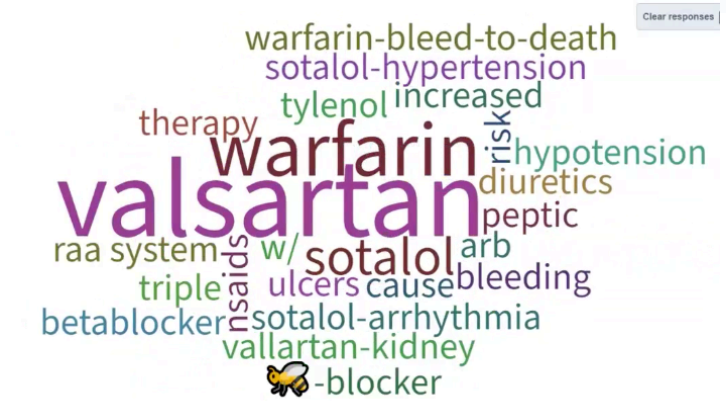
The following are the consequences of NSAIDs-Warfarin interactions EXCEPT:

Increased INR due to competition for CYP2C9	A
Increased risk of peptic ulcer due to competition for CYP2C9	B
Increased blood coagulation due to increased binding of Warfarin to plasma Alpha-1 Acid Glycoprotein	C
Increased risk of bleeding due to impaired primary and secondary hemostasis	D
Increased anti-platelet effect due to decreased binding of NSAIDs to plasma Albumin	E

Answer: C

A: INR would be decreased because of competition for the enzyme
B: increase risk because less enzyme available

In ONE WORD: Give an example of other drug interactions with NSAIDs expected in this patient.



Valsartan is the AT1 receptor antagonist
The action of RAA inhibitors is blunted by NSAIDs
Beta-blockers action is also blunted by NSAIDs

The primary target of Opioids in the Trigeminal Pain Pathway is:

The Anterolateral System (Spinothalamic Tracts)	**A**
Rexed Laminae I and V	**B**
TRPV1 receptors in free nerve endings	**C**
Subnucleus Caudalis of the Spinal Trigeminal Nucleus	**D**
The Insula	**E**

Answer: E