Addendum A: Hypothetical Cases

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Introduction

- Hypothetical cases are presented to illustrate the principles in this course with regards to the selection of non-opioids for pain management in dental patients. These cases are not intended to advocate any particular dental treatment.

- Only abnormal (or pertinent) vital signs have been included.

- Comprehensive dental and radiographic exams were performed for each case, which included screening exams for oral cancer and temporomandibular disorders (TMDs).

- Some details in the case descriptions have been omitted for the sake of brevity.

Self-Assessment

Questions

Each case has a follow-up question pertaining to medication selection for pain management.

Potential Answers

Each case question has a set of potential answers.

Correct Answer and Comment

Following your selection of an answer, the authors provide the correct answer along with comments to explain the answer.

Important Notes

- The cases, questions, and answers were derived from the material presented in this course; there will be one best answer; the comment section will give the best answer and explain why this answer is best and why the other answers are either not as good or are inappropriate.
- Because opioid medications were not covered in this course, no set of potential answers includes an opioid pain medication, but in certain cases an opioid might be considered. This is explained in the comments.
- In certain clinical situations an opioid medication is a valid choice for a pain medication; however, in the majority of cases in dental practice, opioid pain medications are not needed.
- In general, opioid pain medications tend to be overprescribed in dental practice and NSAIDs tend to be underutilized.

Case #1

- **Patient:** Cindy, a 45-year-old Caucasian female, presents to her general dentist with the following chief complaint:
  - **CC:** Severe constant toothache with swelling in the right mandible.
  - **Med/Dent Hx:** No hx of CV, GI, or renal disease, but has a history of addictions and current bipolar disorder for which she is receiving treatment.
  - **Current Meds:** Lithium, quetiapine (Seroquel), fluoxetine (Prozac).
  - **HPI:** Patient stated that she started experiencing throbbing pain 2 weeks ago after eating hard candy. The swelling appeared 1 week ago, has increased, and is sore when palpated.

Case #1 (cont.)

- **Vital Signs:** Temperature 99.7
- **Exam:** Mild extraoral submandibular swelling on the right. Right submandibular lymph nodes are enlarged and tender on palpation.
  - **Tooth #30:** Large amalgam restoration, mesio-distal vertical crack, no response to pulp testing, tender to biting on all the cusps, mucobuccal fold swelling.
  - **Radiograph:** #30 deep restoration, periapical radiolucencies on both roots.
  - **Dental Dx: Tooth #30 necrotic pulp, acute apical abscess, split tooth.**
- **Proposed Dental Tx:** Tooth #30 hopeless prognosis; reviewed options; scheduled patient for extraction of tooth #30 ASAP and incise/drain swelling; prescribed appropriate antibiotic.
- **Rx:** Prescription for pain?

Case #1 Question

The patient is scheduled in the afternoon with an oral surgeon for the extraction, incision, and drainage of the abscess. An appropriate antibiotic was prescribed by the general dentist.

What is the dentist's best option with respect to management of the acute pain?

A. Prescribe ibuprofen 400 mg TID and acetaminophen 1000 mg TID, taken together.
B. Prescribe naproxen 400 mg TID, separated by 2 h past ASA (aspirin).
C. Prescribe celecoxib 200 to 400 mg QD.
D. Prescribe acetaminophen 650 to 1000 mg QID.
E. Consult with a physician or dental specialist prior to prescribing pain medication.

Case #1 Answer

The correct answer is **E**.

Comments

- NSAIDs increase Li blood level, which may cause life-threatening complications, including death due to lithium toxicity.
- Consultation with treating physician would enable temporary adjustment of the lithium dosage and/or monitoring of treatment.
- NSAIDs may be prescribed after lithium dosage is adjusted by treating physician, the patient is informed of risk of drug interaction, and appropriate precautions are communicated to the patient.
- A prescription of a short course of an opioid would be another valid option, but addictions history makes NSAIDs a better choice.
  It is unlikely that acetaminophen would control the pain in this patient, so an NSAID would be a better choice.

Note: If a dentist decides to initiate opioid treatment for a patient, the dentist would need to follow the legal requirements in his/her state for such a prescription. For an Indiana dentist, he/she would need to first consult with INSPECT to verify that the patient has not recently received opioids from other providers.

Case #2

- **Patient:** Frank, a 70-year-old African-American male, presents to an endodontist with the following chief complaint:
  - **CC:** Throbbing pain in the upper-left posterior teeth, on and off, occasionally lasting about an hour; the pain lingers after cold drinks, and there is sharp pain when the patient bites on hard or tough food.
  - **Med/Dent Hx:** No hx of GI or renal disease; however, patient has hx of severe chronic obstructive pulmonary disease (COPD) and had a myocardial infarction 8 months ago.
  - **Current Meds:** Aspirin 81 mg per day (preventive), aspirin 325 mg TID (self-administered for pain), constant flow oxygen (2 liters per minute per nasal cannula).
  - **HPI:** Pain has been present for about 2 weeks and is getting worse. Pain is interrupting patient's sleep, and the patient is anxious about the pain.

Case #2 (cont.)

- **Vital Signs:** Temperature 99.3
- **Exam:** No abnormal findings, other than tooth #14
  - **Tooth #14:** Deep restoration, severe lingering pain on cold, moderately tender to percussion and buccal palpation, positive on biting on palatal cusp.
  - **Radiograph:** Tooth #14 caries under the restoration approximates pulp chamber, periapical radiolucency on palatal root.
  - **Dental Dx: Tooth #14 irreversible pulpitis, symptomatic apical periodontitis.**
  - **Dental Tx:** Options, prognosis, risks, and benefits were discussed; informed consent for endodontics was obtained.
  - **Tooth #14:** Root canal therapy was initiated with local anesthesia and nitrous oxide conscious sedation; four canals were instrumented; calcium hydroxide intracanal medication; and temporary restoration were placed for 2 weeks.
  - **Rx:** Prescription for pain?

Case #2 Question

What is the dentist's best option with respect to management of post-op pain?

A. Prescribe ibuprofen 400 mg TID and acetaminophen 1000 mg TID, taken together.
B. Prescribe naproxen 400 mg TID, separated by 2 h past ASA.
C. Prescribe celecoxib 200 to 400 mg QD.
D. Prescribe acetaminophen 650 to 1000 mg QID.
E. Consult with a physician or dental specialist prior to prescribing pain medication.

Case #2 Answer

The correct answer is **B**.

Comments

- Have patient discontinue 325 mg TID aspirin but continue 81 mg per day aspirin recommended by physician to prevent recurrent MI.
- Naproxen is the safest NSAID in cardiac patients.
- Ibuprofen, diclofenac, and celecoxib should be avoided.
- Separation of aspirin and naproxen by at least 2 hours, which allows for better anticoagulation and fewer GI adverse effects.
- Opioid would not be a good choice due to risk of respiratory suppression in patients with COPD; if used, it could cause life-threatening complications.
- It is unlikely that acetaminophen would control the pain in this patient, so naproxen would be a better choice.

Case #3

- **Patient:** Maria, a 32-year-old Hispanic female, presents to her general dentist with the following chief complaints:
  - **CC:** Severe pain with drinking cold or hot liquids and upon chewing foods. Sometimes she has jaw pain when waking up in the morning, and her jaw muscles are stiff.
  - **Med/Dent Hx:** No hx of CV or renal disease; however, patient has history of irritable bowel syndrome (IBS), has been evaluated for temporomandibular disorders (TMD), and is currently being treated for myofascial pain.
  - **Current Meds:** Cyclobenzaprine.
  - **HPI:** The patient has been having pain associated with her teeth for several weeks and myofascial pain for months.

Case #3 (cont.)

- **Vital Signs:** WNL
- **Exam:** TMJs are tender to palpation bilaterally, masseter muscles are painful to palpation.
  - **Teeth:** Several teeth with deep cavities and lingering pain on cold; several teeth with no response to cold and electrical pulp testing, some of which are painful to percussion.
  - **Radiograph:** Panoramic radiograph shows several teeth with deep cavities, some associated with periapical radiolucencies. No bony pathology to either TMJ observed.
  - **Dental Dx: Multiple teeth with deep carious lesions, some with irreversible pulpitis, with or without apical periodontitis.**
  - **Dental Tx:** Over several appointments during the next 3 weeks: extractions, root canal treatments, and replacement of several crowns.
  - **Rx:** Hydrocodone and Tylenol 5/325 up to 3 days, and then which pain medication?

Case #3 Question

Once the initial 3-day course of pain medication is complete, choose the most appropriate answer. If only one drug regimen is appropriate, select it. If more than one drug regimen is appropriate, select the answer (D or E) with the two appropriate regimens.

A. Prescribe ibuprofen 400 mg TID and acetaminophen 1000 mg TID, taken together.
B. Prescribe naproxen 400 mg TID, separated by 2 h past ASA.
C. Prescribe celecoxib 200 to 400 mg QD.
D. A and C are both appropriate regimens.
E. B and C are both appropriate regimens.

Case #3 Answer

The correct answer is **D**.

Comments

- Low dose of ibuprofen or use of celecoxib is safest in GI patients.
- Combination with acetaminophen potentiates pain-relieving property of both medications due to synergistic effect.
- In this patient, opioids during treatment phase are appropriate, but long-term use is highly discouraged.

Note: If a dentist decides to initiate opioid treatment for a patient, the dentist would need to follow the legal requirements in his/her state for such a prescription. For an Indiana dentist, he/she would need to first consult with INSPECT to verify that the patient has not recently received opioids from other providers.

Case #4

- **Patient:** Denise, a 56-year-old Hispanic female, presents to her dentist with the following chief complaint:
  - **CC:** Constant throbbing pain in an upper-right posterior tooth; pain is worse with light pressure and chewing; pain can move to the upper-right temple.
  - **Med/Dent Hx:** Hypertension controlled by medication.
  - **Current Meds:** Lisinopril.
  - **HPI:** Root canal treatment on tooth #3 was done 3 years ago in an emergency dental clinic; tooth felt fine until 2 months ago, when the patient started to feel pain during chewing that became constant last week.

Case #4 (cont.)

- **Vital signs:** BP 135/80
- **Exam:** No abnormal findings, other than tooth #3
  - **Tooth #3:** Porcelain crown; sensitive to percussion; palpation to buccal and palatal of tooth produces moderate tenderness.
  - **Radiograph:** Tooth #3 previous root canal treatment (RCT), periapical radiolucencies on the mesio-buccal and palatal roots.
  - **Dental Dx: Tooth #3 previous RCT, symptomatic apical periodontitis.**
  - **Dental Tx:** Options, prognosis, risks, and benefits were discussed; tooth #3 root canal retreatment was recommended and will be scheduled within 2 weeks, pending patient's insurance approval, per her request.
  - **Rx:** Prescription for pain?

Case #4 Question

What is the dentist's best option with respect to pain management during the next 2 weeks?

A. Prescribe ibuprofen 400 mg TID and acetaminophen 1000 mg TID, taken together.
B. Prescribe naproxen 400 mg TID, separated by 2 h past ASA.
C. Prescribe celecoxib 200 to 400 mg QD.
D. Prescribe acetaminophen 650 to 1000 mg QID.
E. Consult with a physician or dental specialist prior to prescribing pain medication.

Case #4 Answer

The correct answer is **C**.

Comments

- Use of celecoxib or sulindac is recommended because they produce lesser degree of blood pressure elevation.
- Celecoxib should be used QD and not BID regardless of the dose due to heightened risk of myocardial infarction in BID regimen.
- Blood pressure control with Lisinopril may fail in the presence of NSAIDs. Lisinopril is an ACE inhibitor and, as such, may cause acute kidney failure in combination with NSAIDs, so you must counsel patients and watch for possible complications.
- Short course of an opioid is an option if NSAIDs do not control pain. It is unlikely that acetaminophen would control the pain in this patient, so celecoxib or sulindac, or an opioid if needed, would be better choices.

Note: If a dentist decides to initiate opioid treatment for a patient, the dentist would need to follow the legal requirements in his/her state for such a prescription. For an Indiana dentist, he/she would need to first consult with INSPECT to verify that the patient has not recently received opioids from other providers.

Case #5

- **Patient:** Emily, a 32-year-old Caucasian female who has moved from another state, presents to her family's dentist for the first time with the following chief complaint:
  - **CC:** Constant pain in an upper-left tooth that wakes her up at night.
  - **Med/Dental Hx:** 28 weeks pregnant. Patient has had multiple cavities since high school, likely due to a diet with excessive consumption of soft drinks; patient has had limited access to dental care during the last few years.
  - **Current Meds:** Prenatal vitamins.
  - **HPI:** Pain in the upper-left maxillary region started a few weeks ago and gradually became worse during the last week.

Case #5 (cont.)

- **Vital Signs:** WNL
- **Exam:** No abnormal findings, other than tooth #13
  - **Tooth #13:** Deep distal occlusal caries, lingering pain on cold test, percussion and buccal palpation positive.
  - **Radiograph:** Tooth #13 carious pulp exposure, 2 x 2 mm periapical radiolucency.
  - **Dental Dx: Tooth #13 irreversible pulpitis, symptomatic apical periodontitis.**
  - **Dental Tx:** Tooth #13 root canal treatment was recommended, and options were discussed: extraction, an implant, or a fixed partial denture (bridge). Patient said she will talk to her family and call to schedule tomorrow.
  - **Rx:** Prescription for pain?

Case #5 Question

What is the dentist's best option with respect to pain management while the patient decides whether to proceed with dental treatment?

A. Prescribe ibuprofen 400 mg TID and acetaminophen 1000 mg TID, taken together.
B. Prescribe naproxen 400 mg TID, separated by 2 h past ASA.
C. Prescribe celecoxib 200 to 400 mg QD.
D. Prescribe acetaminophen 650 to 1000 mg QID.
E. Consult with a physician or dental specialist prior to prescribing pain medication.

Case #5 Answer

The correct answer is **D**.

Comments

- NSAIDs are contraindicated in 3rd trimester due to premature closure of ductus arteriosus and risk of fetal death.
- Use acetaminophen or a short course of an opioid.
  - Acetaminophen might not control the pain in this patient, but because the patient is in her 3rd trimester of pregnancy, it is an option that needs to be considered instead of an NSAID.

Note: If a dentist decides to initiate opioid treatment for a patient, the dentist would need to follow the legal requirements in his/her state for such a prescription. For an Indiana dentist, he/she would need to first consult with INSPECT to verify that the patient has not recently received opioids from other providers.

Case #6

- **Patient:** Tyler, a 28-year-old African-American male, presented to his dentist with the following chief complaint:
  - **CC:** Excruciating pain in a lower-left posterior tooth that is worse on chewing.
  - **Med/Dental Hx:** Recently diagnosed congenital atrophy of the left kidney.
  - **Current Meds:** Self-administered ibuprofen 600 mg every 8 hours for the last 2 weeks for the dental pain.
  - **HPI:** Pain in the region of tooth #19 has occurred for the last 3 months, which has become worse during the last 2 weeks.

Case #6 (cont.)

- **Vital Signs:** BP 145/85
- **Exam:** No abnormal findings, other than tooth #19
  - **Tooth #19:** Subgingival caries on the mesial, subgingival distal-lingual cusp fracture, no response to cold, percussion and buccal palpation severely tender.
  - **Radiograph:** Tooth #19 subgingival caries, periradicular and furcation radiolucency.
  - **Dental Dx: Tooth #19 subgingival caries, subgingival DL cusp fracture, necrotic pulp, symptomatic apical periodontitis.**
  - **Prognosis:** Poor, tooth is not restorable; findings, prognosis, and options with risks and benefits were discussed.
  - **Dental Tx:** Tooth #19 extraction was performed.
  - **Rx:** Prescription for pain?

Case #6 Question

What is the dentist's best option with respect to pain management for immediate post-op pain?

A. Prescribe ibuprofen 400 mg TID and acetaminophen 1000 mg TID, taken together.
B. Prescribe naproxen 400 mg TID, separated by 2 h past ASA.
C. Prescribe celecoxib 200 to 400 mg QD.
D. Prescribe acetaminophen 650 to 1000 mg QID.
E. Discontinue ibuprofen and consult with the treating physician, or if the treating physician cannot be contacted, prescribe an opioid and refer the patient to the treating physician.

Case #6 Answer

The correct answer is **E**.

Comments

- It is important to immediately discontinue ibuprofen because of kidney problems.
- Do not prescribe naproxen—ibuprofen and naproxen produce high COX-1 inhibition and risk for kidney damage.
- Do not prescribe acetaminophen—acetaminophen would likely be ineffective and is associated with a risk of kidney disease (although to a lesser degree than with NSAIDs).
- The use of an opioid is appropriate in this patient, but consulting with the patient's physician first is advisable, if possible.

Note: If a dentist decides to initiate opioid treatment for a patient, the dentist would need to follow the legal requirements in his/her state for such a prescription. For an Indiana dentist, he/she would need to first consult with INSPECT to verify that the patient has not recently received opioids from other providers.

Case #7

- **Patient:** Tracy, a 45-year-old Caucasian female, presented to her dentist with the following chief complaint:
  - **CC:** Upper front tooth has a dull ache, which is worse with pressure; tooth feels loose.
  - **Med/Dental Hx:** Patient reported being “healthy,” but she did also report recent shortness of breath and lower leg swelling.
  - **Meds:** Self-administered ibuprofen 800 mg every 8 hours for the last 3 days for the dental pain.
  - **HPI:** Patient was in a car accident 3 days ago; got hit in the mouth by a steering wheel; tooth #7 started to hurt and patient has been taking ibuprofen to control the pain. She noticed new severe lower leg edema; patient also mentioned recent and new symptoms of irritability and hot flashes.

Case #7 (cont.)

- **Vital Signs:** WNL
- **Exam:** No abnormal findings, other than tooth #7
  - **Teeth #6-11 and #22-27:** Only #7 produced abnormal findings.
  - **Tooth #7:** No response on cold test or electric pulp test; gray discoloration of the enamel; mobility grade II; percussion and facial palpation moderately tender.
  - **Radiograph:** Tooth #7 periapical radiograph was suggestive of the horizontal root fracture. Cone Beam CT of the anterior maxilla was performed; tooth #7 horizontal root fracture in the coronal third of the root was found.
  - **Dental Dx: Tooth #7 necrotic pulp, symptomatic apical periodontitis, horizontal root fracture in the coronal third of the root.**

Case #7 (cont.)

- **Prognosis:** Poor. Findings, poor prognosis, and options were discussed.
- **Dental Tx:** Among the various options offered, the patient chose to have tooth #7 extracted and replaced with an implant and crown. Impressions for a temporary tooth #7 removable prosthesis (“flipper”) were taken, and extraction was scheduled in 3 days.
- **Rx:** Prescription for pain?

Case #7 Question

What is the dentist's best option with respect to pain management for the next 3 days, prior to beginning the definitive dental treatment?

A. Prescribe ibuprofen 400 mg TID and acetaminophen 1000 mg TID, taken together.
B. Prescribe naproxen 400 mg TID, separated by 2 h past ASA.
C. Prescribe celecoxib 200 to 400 mg QD.
D. Prescribe acetaminophen 650 to 1000 mg QID.
E. Refer the patient to the emergency room or to her physician to be seen ASAP.

Case #7 Answer

The correct answer is **E**.

Comments

- Prescribing in this patient is outside of usual dental expertise.
- Suspect ibuprofen is responsible for edema, hot flashes, and irritability.
- Discontinue ibuprofen, and refer patient to ER or a treating physician.
- Short course of an opioid would be appropriate, but the emphasis should be on getting this patient to a physician ASAP.

Note: If a dentist decides to initiate opioid treatment for a patient, the dentist would need to follow the legal requirements in his/her state for such a prescription. For an Indiana dentist, he/she would need to first consult with INSPECT to verify that the patient has not recently received opioids from other providers.

Final Comments

- NSAIDs can be effective for dental patients.
- NSAIDs can be safe if associated risks are understood and an appropriate NSAID is prescribed, where indicated.
- Acetaminophen is usually not very effective for moderate to severe pain in dental patients, unless combined with an NSAID.
- In certain cases an opioid is a valid choice for pain control, but in the majority of cases in dental practice opioid pain medications are not needed.

Note: If a dentist decides to initiate opioid treatment for a patient, the dentist would need to follow the legal requirements in his/her state for such a prescription. For an Indiana dentist, he/she would need to first consult with INSPECT to verify that the patient has not recently received opioids from other providers.

Final Comments

- In general, opioid pain medications tend to be overprescribed in dental practice, and NSAIDs tend to be underutilized.
- You should now be better prepared to prescribe NSAIDs for the management of pain in your dental patients.

Note: Addendum B, "Analyzing the Risk of Adverse Events Associated with NSAIDs," provides more information about the science of evaluating risks, for those interested. Addendum B is optional material.