The iQ&A interactive Pain Management Intelligence Zone

FOCUS ON SAFE AND EVIDENCE-BASED USE OF IV NON-OPIOID ANALGESICS AS PART OF MULTIMODAL PERIOPERATIVE PAIN MANAGEMENT AND ENHANCED RECOVERY AFTER SURGERY (ERAS)

National Experts Address, Analyze, and Respond to FAQs Focused on Optimizing Perioperative Pain and ERAS with Non-Opioid IV Medications

A Year 2017 Evidence-, Trial-, and Expert-Based FAQ-Based Online Initiative for the Anesthesiology, Orthopedic Surgery, General Surgery and Bariatric Surgery Specialist

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Question # 1: What do studies show about the relationship between the use of IV acetaminophen as part of multimodal perioperative pain management and hospital length of stay for various surgical procedures?

Question # 2: What is the optimal dosing for deploying IV acetaminophen and how should it be combined with opioid therapy?

Question # 3: In addition to administering IV acetaminophen pre-op and post-op, how do you combine it with opioid therapy? Do you use the IV narcotic as a primary pain reliever in bariatric surgery or as a rescue medication?

Question # 4: Based on the evidence for efficacy of IV versus PO acetaminophen, which route do you prefer in the setting of bariatric surgery and why? How long do you give IV acetaminophen, typically, in the case of bariatric surgery, prior to switching to PO?

Question # 5: What is the safety profile of IV acetaminophen? And what makes this safety and side effect profile uniquely suited to multimodal pain relief in bariatric patients undergoing bariatric surgery? How do you counsel the patient pre-operatively about what to expect from using acetaminophen as a foundational pain agent? Do you monitor LFTs in patients on IV acetaminophen?

Question # 6: Are there any contraindications to the use of IV acetaminophen in the setting of bariatric or other surgical procedures? What are the implications for dosing and/or dose reduction?

Question # 7: How does the use of IV acetaminophen differ from the use of oral acetaminophen, especially when used in conjunction with IV opioid therapy? Do GI symptoms — nausea, vomiting and intolerance to PO intake — or concerns about malabsorption affect your decision to routinely use IV acetaminophen?

Question # 8: How did you address the issue of (a) poor pain control and/or (b) recurrent emergency department visits and/or hospital readmissions in your patients who underwent bariatric surgery? And how did your study help identify solutions and/or causes related to these clinical observations and challenges? What foundational role emerged for IV acetaminophen aimed at cost reduction and improved outcomes?

Question # 9: Can you summarize and discuss the trial design and results of your study published in JGS (J Gastrointest Surg. 2016 Apr;20(4):715-24) evaluating cost-savings and clinical metric improvements using IV acetaminophen as a core agent within the context of multimodal pain management for bariatric surgery?

Question # 10: What time parameters did you use for tracking reduction in emergency department visits and hospital readmissions associated with IV acetaminophen use? And what about the need to use rescue narcotics?

Question # 11: With respect to reduction in overall costs — including direct and indirect costs — associated with deployment of pre- and post-operative IV acetaminophen in bariatric surgery patients, where did you observe the greatest cost savings in the group managed with IV acetaminophen?

Question # 12: What differences in quality-of-life and/or patient-reported pain measures or scores did you observe in the group treated with IV acetaminophen?

Question # 13: Did your study essentially show that even though pain scores did not differ significantly during the post-op 24 hour period between the groups that did and did not receive IV acetaminophen, during the 30-day post-op observation period, the group that received IV acetaminophen incurred fewer emergency department visits, hospital readmissions, pain-related complaints, and lower indirect costs?

Question # 14: What are the pharmacoeconomic and “pain management policy” implications of your study evaluating differential costs and clinical metrics in bariatric surgery patients managed with IV acetaminophen? What are the institutional and patient (pain-related) satisfaction implications of your study?

Question # 15: Why do bariatric surgery patients represent an ideal patient population for use of IV acetaminophen as a part of multimodal post-operative pain management?

Question # 16: Why is the exclusive use of IV opioids in bariatric surgery patients problematic and why is IV acetaminophen uniquely qualified to be part of multimodal post-operative pain management?

Question # 17: Do you use IV acetaminophen as part of a standardized protocol or do you select patients you think are appropriate for this approach based on specific criteria?

Question # 18: Are there any situations where you might consider the use of IV acetaminophen as part of monotherapy for certain surgical procedures, as opposed to its use as a non-opioid foundational agent that is part of a multimodal approach requiring rescue with opioids?
Question # 19: How does the side effect profile of acetaminophen compare with placebo or other non-opioid agents?

Question # 20: Clearly, your clinical experience has established the efficacy, safety and cost-effectiveness associated with IV acetaminophen in the setting of bariatric surgery, but are there are surgical procedures outside this context where you think this approach to pain control may provide similar advantages?

Question # 21: In summary, what unique aspects of your trial design (J Gastrointest Surg. 2016 Apr;20(4):715-24) do you think are worth emphasizing? And what are the take-home messages about the mechanism(s) by which IV acetaminophen reduces indirect costs?

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Question # 22: What have we learned about the relationship between the use of IV acetaminophen as part of multimodal pain management in various surgical settings — bariatric surgery, colorectal surgery, TKR, and THR — and reduction of length-of-stay (LOS) outcomes in this patient population? Can you site specific studies and discuss problematic aspects of IV opioids for pain management?

Question # 23: What clinical observations argue for the position that IV acetaminophen should be a foundation component of multimodal pain management, whereas IV opioids—which while effective, are also associated with a range of problematic side effects — should be considered so-called “rescue” or “pain breakthrough”-alleviating agents?

Question # 24: What are the mechanism(s) of action by which IV acetaminophen exerts its pain-relieving properties and how is this differentiated from other agents? And what is the approved dosing schedule for this agent?

Question # 25: What has been the role of IV acetaminophen in establishing Enhanced Recovery After Surgery (ERAS) protocols across the spectrum of surgical procedures; and what are the objectives of the ERAS strategy? Is it part of your multimodal approach at the Cleveland Clinic? And at what dosing regimen is IV acetaminophen employed?

Question # 26: Given its documented efficacy and safety profile, across what range of surgical procedures and perioperative situations is IV acetaminophen ideally employed as part of an ERAS strategy in the context of multimodal pain mitigation? What advantages have you observed with IV acetaminophen and when should it be initiated, and for what duration?

Question # 27: What are the unique advantages — in the immediate and extended post-operative period — of IV acetaminophen in the bariatric surgery population? How does this agent offer particular advantages in light of the GI and respiratory disturbances encountered in this patient population?

Question # 28: As you know, length-of-stay (LOS) is a critical cost- and best practice metric reflecting quality of care. In light of this, what have the studies shown as far as the effect of IV acetaminophen on LOS and ERAS benchmarks across the range of surgical procedures — colorectal, cardiovascular, orthopedic and others — and what are the implications?

Question # 29: What is the optimal time for initiating IV acetaminophen? At the beginning of surgery? Before the surgical insult? What is the rationale for pre-emptive use of this pain reliever?

Question # 30: Given the known and problematic side effects of IV opioids — respiratory depression, nausea, vomiting, decreased oxygen saturation, and other effects on GI motility and absorption — what role does IV acetaminophen play in reducing opioid doses required to achieve multimodal pain control and ERAS? And, what about opioid dependency?

Question # 31: Given the existence of other non-opioid IV agents that have been explored as co-therapies to achieve ERAS, why do you believe IV acetaminophen may have properties — efficacy, safety profile and MOA — that are superior to other agents in the multimodal perioperative context, thereby supporting its foundational status?

Question # 32: Given that opioids are known to inhibit peristalsis and GI absorption and potentially affect PK/PD profiles of oral acetaminophen and other agents, what is the rationale for using the IV form of acetaminophen for ERAS and other dimensions of pain control in the operative and post-operative setting?

Question # 33: While improvements in LOS are well documented with IV acetaminophen, what other global functional improvements and outcomes — ambulation, in particular — have been observed in orthopedic, colorectal, and general surgery studies evaluating these outcomes related to persistent surgical pain?
Question # 34: Can you summarize the foundational role of IV acetaminophen in improving functional, pain, and LOS-related outcomes across the spectrum of surgical procedures, and therefore, its use as an effective and safe pillar agent that reduces opioid consumption and side effects within the context of ERAS?

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Question # 35: What are the advantages and disadvantages of using IV opioids as monotherapy outside the context of multimodal therapy, where other agents are used in conjunction as part of ERAS? What are the downsides of this approach?

Question # 36: What is the concept of ERAS and how does it affect your selection of pain-relieving agents and strategies, including multimodal approaches, in the perioperative setting?

Question # 37: What are the mechanism(s) of action by which IV acetaminophen exerts its pain-relieving properties and how is this differentiated from other agents? Why is this MOA particularly valuable and complementary as part of multimodal therapy in conjunction with opioids?

Question # 38: Given that IV opioids are known to inhibit peristalsis and GI absorption and potentially affect PK/PD and C-max/T-max profiles of oral acetaminophen and other agents, what is the rationale and what is the literature support for using the IV form of acetaminophen as opposed to the oral formulation?

Question # 39: From a practical perspective, what is the optimal dosing strategy for deploying IV acetaminophen and how should it be combined with IV or opioid therapy? What is the role of this approach in the ambulatory surgery unit? And in what types of surgery have you found this formulation ideal and why?

Question # 40: What is the exact dosing schedule you recommend and use for acetaminophen? Why do you feel that IV acetaminophen is preferable to the oral formulation and what is the effect of IV opioids on absorption and blood levels or oral acetaminophen? And in what surgical situations are these factors important?

Question # 41: In what specific surgical procedures — from orthopedics to colorectal surgery — is IV acetaminophen indicated as a core agent in the context of multimodal management and ERAS? And what are the indications for this agent?

Question # 42: Can you compare and contrast the efficacy and, especially, the safety of IV acetaminophen with the other IV non-opioid agents that are sometimes used in conjunction with IV opioids? Why do you consider acetaminophen the “backbone” of multimodal analgesia?

Question # 43: If you have a surgical patient who is on both IV acetaminophen and an IV opioid and the patient becomes intolerant to the opioid, can you continue the IV acetaminophen alone as monotherapy and/or what other non-opioid might you add to achieve synergies?

Question # 44: What are the implications of IV acetaminophen having 100% bioavailability versus the oral formulation which undergoes first pass hepatic metabolism? How does this affect C-max and what are the clinical implications?

Question # 45: What do T-max-focused studies show about the advantages of the IV route of administration of acetaminophen over oral and other formulations?

Question # 46: Since a significant effect of acetaminophen is on central CNS receptors, what do studies measuring CSF levels show regarding IV administration of acetaminophen? What do AUC results show and what is the significance of these findings clinically?

Question # 47: What are the effects of IV opioids on gastric emptying, transit, and GI absorption of IV acetaminophen versus oral acetaminophen? What is the clinical and PK impact of giving concomitant opioids on these two routes of acetaminophen administration?

Question # 48: What did the TKR orthopedic study by Sinatra and colleagues show about the pain relieving properties of IV acetaminophen (four doses) and its effect on rescue opioid use and reduction of total morphine usage?

Question # 49: How will the ACA and other regulations affect strategies for taking care of post-operative pain? What parameters of success will be evaluated?

Question # 50: How will mandated cardiac surgery bundles that go into effect in January, 2018 affect strategies for perioperative management and ERAS of patients undergoing cardiac surgery?
Question # 51: What has been your experience with the CMMI CABG bundle? And how has this affected your approach to ERAS protocols?

Question # 52: How has attention to optimizing multimodal analgesia to achieve ERAS affected patient care of cardiac surgical patients? And why have you chosen “pre-emptive” IV acetaminophen as a foundational approach to ERAS and outcome optimization in the CABG setting?

Question # 53: Are there any studies available utilizing pre-operative multimodal analgesia before cardiac surgery?

Question # 54: What are some of the pitfalls of instituting IV acetaminophen after cardiac surgery as opposed to starting it pre- or intra-operatively; and what are the problems associated with either (a) oral acetaminophen or (b) failing to administer a sufficient dose/course or premature discontinuation of IV acetaminophen?

Question # 55: What dose of IV acetaminophen do you recommend for your CABG patients and have any of the patients who received IV acetaminophen after cardiac surgery required no other IV narcotics?

Question # 56: What actionable insights can we draw upon from the European experience with IV acetaminophen in the setting of multimodal pain management for surgical procedures?

Question # 57: How has the ERAS movement affected multimodal pain management protocols for CABG? And where does IV acetaminophen fit into these perioperative critical pathways?

Question # 58: What is the optimal dosing for IV acetaminophen and how should it be combined with other modalities? What is the safety profile of IV acetaminophen and what is its opioid-sparing profile for cardiac surgical patients?

Question # 59: Why is IV acetaminophen your foundational multimodal agent? And, as a surgical patient transitions from IV to PO acetaminophen after cardiac surgery, what are some of the pitfalls and tips for making this transition?

Question # 60: What cardiac surgery patients — the elderly and others — are the ideal candidates for IV acetaminophen therapy? What clinical factors suggest this approach is especially appropriate as part of multimodal analgesia?

Question # 61: Can such nonsteroidal agents as IV Toradol be safely used after cardiac surgery? What are the problematic aspects of this approach? And why might IV acetaminophen be preferable in certain patient populations?

Question # 62: Based on your experience, how many doses of IV acetaminophen are required to optimize pain control after cardiac surgery? Do you individualize your approach and, if so, based on what factors?

Question # 63: Can patients be expected to absorb PO acetaminophen as soon as they are tolerating a liquid diet following cardiac surgery?

Question # 64: What is the role of nursing-focused education to facilitate introduction of IV acetaminophen into a multimodal pain management protocol? And what degree of reduction of IV opioid use did you observe after this protocol change?

Question # 65: What is the mission statement of your ERAS group focused on cardiac surgery? And what is the foundational role of IV acetaminophen to push your ERAS goals, including reduced opioid consumption and reduced LOS, forward?

Question # 66: In your discussions with many other cardiac surgery centers focused on reducing opioid use and pushing forward ERAS-based protocols, what consensus, if any, have you seen regarding IV acetaminophen use?

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Question # 67: What are the ASA/APS guideline recommendations for multimodal perioperative pain management and how important are opioids as drivers to prolongation of LOS associated with surgical procedures?

Question # 68: What is the evidence that opioid-related side effects compromise patient-related outcomes and satisfaction? And prolong LOS?

Question # 69: What is the optimal dosing schedule for IV acetaminophen and how should it be combined with opioid therapy?

Question # 70: Are there any situations where you might consider the use of IV acetaminophen as part of monotherapy for certain surgical procedures, as opposed to its use as a non-opioid foundational agent that is part of a multimodal approach requiring rescue with opioids?

Question # 71: What are the mechanism(s) of action by which IV acetaminophen exerts its pain-relieving properties and how is this differentiated from other agents?

Question # 72: How does the MOA of IV acetaminophen suggest how to combine it with other agents as part of multimodal management for ERAS?

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Question # 73: Is there a patient preference component that is a significant driver to helping select agents for multimodal therapy? And what about expectations as part of the ERAS pathway?

Question # 74: Do we have studies that provide information about the comparative efficacy of non-opioid agents used as part of multimodal perioperative pain management? And what about comparative safety?

Question # 75: From a safety and efficacy standpoint, what is the rationale for using such agents as IV acetaminophen as part of multimodal analgesia to reduce overall opioid consumption?

Question # 76: Can you walk us through the practical and “best practice” aspects and roadmap for how to dose and infuse IV acetaminophen, including timing and duration of administration as part of an ERAS protocol?

Question # 77: What is the clinical importance of avoiding the hepatic first-pass effect when using the IV versus oral formulation of acetaminophen, and what PK advantages and tissue penetration/compartment effects are observed that are responsible for improved efficacy?

Question # 78: What is the clinical importance of avoiding the hepatic first-pass effect when using the IV versus oral formulation of acetaminophen, and what PK, AUC, and C-max advantages and tissue penetration/compartment effects are observed that are responsible for improved efficacy of the IV route of administration?

Question # 79: Can you summarize the literature- and trial-based support for the use of IV acetaminophen as part of multimodal pain management in the surgical setting?

Question # 80: Is the efficacy of IV acetaminophen “universal” across many types of surgical procedures?

Question # 81: What trial-based evidence do you think is most compelling to support the use of IV acetaminophen in the setting of TKR and THR — a high pain model in orthopedic surgery context? Can you summarize the data? What did we learn about the degree of opioid rescue? And patient satisfaction?

Question # 82: Is there a risk of acetaminophen masking a surgical infection because of its anti-pyretic effect?

Question # 83: What makes the side effect profile of IV acetaminophen uniquely suited for perioperative pain management as compared to IV opioids?

Question # 84: What are the contraindications to the use of IV acetaminophen?

Question # 85: What other agents or perioperative physiological factors can affect absorption of oral acetaminophen, thereby making this route potentially problematic and less reliable than IV acetaminophen?

Question # 86: What is your strategy in a patient who has become intolerant of an opioid?

Question # 87: How rapid is the onset of action for IV acetaminophen and when is the C-Max achieved after a 15-minute infusion? How does the IV formulation C-Max metrics compare to the oral formulation?

Question # 88: What do we know about patient satisfaction as it relates to perioperative pain management, including in patients on IV acetaminophen? And what role does opioid reduction play?

Question # 89: What is the importance of opioid avoidance as a foundational strategy for multimodal pain management in the perioperative setting? And where does IV acetaminophen fit into that best pain management practice equation?