

Multi-modal Pain Management

Crafting a Results-Oriented Pragmatic Approach

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Disclosures

- I have received payment from the Illinois Human Performance Project for my expert opinion as a panelist.
- I have received payment and in-kind compensation as a speaker and expert on the American Opioid Epidemic from private sources.
- I have received stipend compensation as a continuing education provider for pharmacists and pharmacy technicians.
- I have lent my clinical expertise to legislative lobbying at the federal level resulting in the passage of state and federal opioid legislation (December 2022 – Federal; August 2025 – State).
- I have lent my expertise and perspective (NOT compensated) to Vertex Pharmaceuticals with respect to clinical application of its new entrant into the pain space
- I have lent my expertise and perspective (NOT compensated) to a start-up operation that is developing a risk prediction tool to identify patients at elevated risk of opioid use disorders
- I have no relevant financial relationships that would compromise the objectivity of this discussion

All Disclosures were peer reviewed and there are no conflicts with ineligible companies in this presentation.



Disclosures

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Objectives

1. Describe the framework for crafting a multi-modal pain management plan
2. Identify agents to address root causes of post-operative surgical pain
3. Describe emerging trends and pharmacological tools for pain management
4. Formulate a plan to educate patients on the utility of multi-modal pain management



America's Opioid Epidemic

Understanding the problem we can help solve

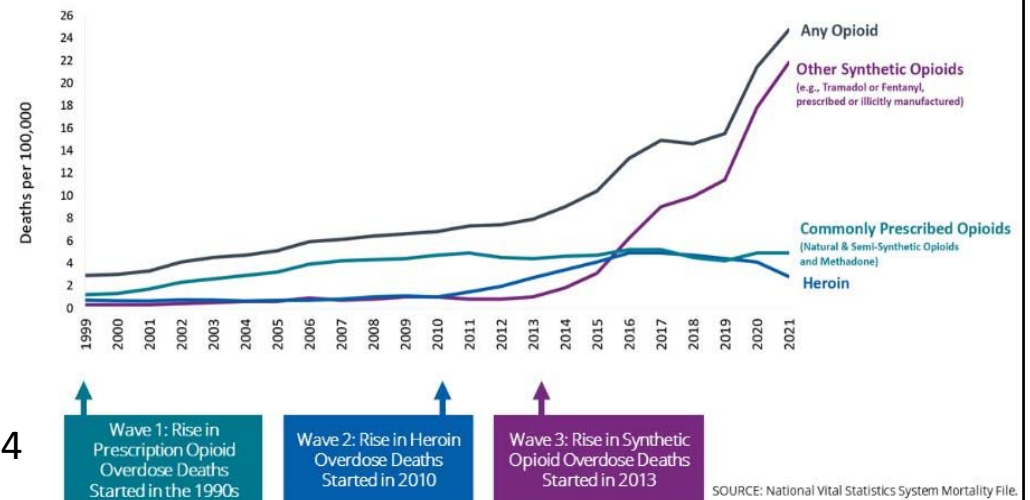


America's Opioid Epidemic

The scope of the problem by the numbers:

- Nearly 645,000 Americans died of opioid overdoses from 1999-2021
- Death toll increased 6-fold in 2021 compared to 1999
- 2023: 83,000+ opioid deaths; more than 76,000 from fentanyl¹
- 2024: Nearly 55,000 opioid deaths; more than 48,000 from fentanyl
- Leading cause of death in adults 18-44 years of age

Three Waves of Opioid Overdose Deaths



Source: Centers for Disease Control

1. First decrease in overdose deaths, including opioids, in 5 years



America's Opioid Epidemic

The scope of the problem in clinical context



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In 2025: roughly 120 Americans die every day from an opioid overdose

Estimates range from 3-19% (Median 11%) of patients prescribed opioids are at risk for developing an opioid use disorder

Estimates suggest nearly 65% of prescribed opioid doses are unused by patients presenting a sizeable risk for diversion

A 2021 JAMA Network study reported 6.7% of opioid-naïve patients continue to use opioids one year after surgery (95% CI: 4.5%-9.8%)

Sources: Centers for Disease Control, JAMA Network



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America's Opioid Epidemic

The Impact on our Surgical Patients



America's Opioid Epidemic

The Impact on Our Surgical Patients

- Patients are aware of the scope of the epidemic
- The death toll is staggering, and fear often prevails
- Patients are making decisions based on fear and making demands that are not in their best interest
- Plenty of patients are still fearful of “getting addicted to the pain meds”



America's Opioid Epidemic

Addressing Patient Concerns

Original Article

Reduced Opioid Prescription After Anterior Cruciate Ligament Reconstruction Does Not Affect Postoperative Pain or Prescription Refills: A Prospective, Surgeon-Blinded, Randomized, Controlled Trial

Matthew J. Hartwell, M.D., Ryan S. Selley, M.D., Bejan A. Alvandi, M.D., Steven R. Dayton, B.A., Michael A. Terry, M.D., and Vehniah K. Tjong, M.D.

Patient education and engagement in postoperative pain management decreases opioid use following knee replacement surgery

Meghana Yajnik ¹, Jonay N Hill ², Oluwatobi O Hunter ³, Steven K Howard ⁴, T Edward Kim ⁵, T Kyle Harrison ⁶, Edward R Mariano ⁷

Affiliations + expand

PMID: 30219634 DOI: [10.1016/j.pec.2018.09.001](https://doi.org/10.1016/j.pec.2018.09.001)



Hartwell MJ, Selley RS, Alvandi BA, Dayton SR, Terry MA, Tjong VK. Reduced Opioid Prescription After Anterior Cruciate Ligament Reconstruction Does Not Affect Postoperative Pain or Prescription Refills: A Prospective, Surgeon-Blinded, Randomized, Controlled Trial. *Arthrosc Sports Med Rehabil*. 2021 Apr 12;3(3):e651-e658. doi: 10.1016/j.asmr.2020.12.012. PMID: 34195628; PMCID: PMC8220566.

Yajnik M, Hill JN, Hunter OO, Howard SK, Kim TE, Harrison TK, Mariano ER. Patient education and engagement in postoperative pain management decreases opioid use following knee replacement surgery. *Patient Educ Couns*. 2019 Feb;102(2):383-387. doi: 10.1016/j.pec.2018.09.001. Epub 2018 Sep 5. PMID: 30219634.

Is There a Model for a Solution?



There's a Strategy 8,500 miles South

La Seleccion de Argentina – La Albiceleste

- Top of mind elite international football team
- An engrained part of the cultural fabric of a nation of 48 million people who hail from every part of the globe
- Three-time world champions with World Cup™ victories:

1978 - Argentina

1986 - Mexico

2022 – Qatar



Let's look at the 36-year drought between Mexico & Qatar

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There's a Strategy 8,500 miles South

La Seleccion de Argentina – La Albiceleste: The 36-year Drought

- High Volume Economy Anchored by Energy Exports Grain & Beef
- Relatively low unemployment with skyrocketing inflation
- La Albiceleste is the foundational source of pride and the shining beacon to the rest of the world
- A 36-year silverware drought was unacceptable with the greatest player in the game's history wearing the kit
- 11 Managers at the helm without a World Cup until...



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There's a Strategy 8,500 miles South

La Seleccin de Argentina – La Albiceleste: The 36-year Drought

Lionel Scaloni



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- Role player during his career in the English Premier League and Internationally
- 2018: Succeeded a series of high-profile names with an appointment that raised questions
- To date: 4 major trophies including the first star in 36 years
- Widely regarded as the premier manager in the sport



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How Did Scaloni Do This?

La Seleccin de Argentina – La Albiceleste: The 36-year Drought

- The football elite wondered the same thing I did
- The players gave the answer:
- He thought about every crucial situation on the pitch
- He had multiple strategies to address them
- He planned out the best use of his players
- He made every player aware of the plan
- Scaloni made it clear to the faithful he understood the team's crucial role in the wellbeing of the nation and the people



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How Did Scaloni Do This?

La Seleccin de Argentina – La Albiceleste: The 36-year Drought



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**The hinchas refer to
the team
As La Scaloneta**



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Let's Apply the Scaloni Model

Pain is a significant issue to address in surgery



Multimodal Pain Strategies

Leveraging our spectrum of tools to optimize outcomes and patient satisfaction

- Multimodal Pain Management is used as a buzz term – It's really a strategic approach
- It's most effective when tailored to the implications of the surgical procedure
- Addresses the root causes of pain and leverages the medications and treatments for optimal impact
- Provides the best scenario for a patient to rehabilitate and recover

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Multimodal Pain Strategies

Leveraging our spectrum of tools to optimize outcomes and patient satisfaction

DOI: 10.1001/jama.2022.16844

Effect of a Postoperative Multimodal Opioid-Sparing Protocol vs Standard Opioid Prescribing on Postoperative Opioid Consumption After Knee or Shoulder Arthroscopy: A Randomized Clinical Trial

NO Pain Investigators; Aaron Gazendam ¹, Seper Ekhtiari ¹, Nolan S Horner ¹, Nicole Simunovic ¹, Moin Khan ¹, Darren L de Sa ¹, Kim Madden ¹, Olufemi R Ayeni ¹

Collaborators, Affiliations + expand
PMID: 36194219 PMCID: PMC9533185 DOI: 10.1001/jama.2022.16844

Patient Satisfaction With Nonopioid Pain Management Following Arthroscopic Partial Meniscectomy and/or Chondroplasty

Stephen D Daniels ¹, Kirsten D Garvey ², Jamie E Collins ², Elizabeth G Matzkin ³

Affiliations + expand
PMID: 31072715 DOI: 10.1016/j.arthro.2019.03.028

The Utility of Oral Nonsteroidal Anti-inflammatory Drugs Compared With Standard Opioids Following Arthroscopic Meniscectomy: A Prospective Observational Study

Hien Pham ¹, Michael Pickett ¹, Michelle Yagnatovsky ¹, Mark Kramarchuk ¹, Michael J Alala ¹, Eric J Strauss ¹, Laith M Jazrawi ¹, Kirk A Campbell ²

Affiliations + expand
PMID: 30733030 DOI: 10.1016/j.arthro.2018.09.018

Multimodal Pain Strategies

Leveraging our spectrum of tools to optimize outcomes and patient satisfaction

Pain Dilemma:

Turning around an underperforming treatment approach

- Reliance on opioids to diminish the brain's appreciation of the intensity of pain
- Public pressure to make changes for safety and wellbeing given the addiction dangers
- Financial pressure from third party payers with reimbursement penalties

Scaloni's Dilemma:

Turning around an underperforming elite level football team

- Reliance on the skills of a superstar talent resulting in complacency and a competitive deficit
- Public pressure to show international success given the role of cultural importance in Argentine society
- Financial pressure on the AFA from advertisers hesitant to spend without high profile victories



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

The NSAIDs



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- Non-steroidal anti-inflammatory medications (NSAIDs)
- Cyclooxygenase inhibitors (selective & non-selective)
 - Non-selective (COX-1 & COX-2): ibuprofen, naproxen, diclofenac
 - Selective (COX-2): celecoxib
- Controls inflammation to diminish pain producing volume while maintaining a suitable amount to promote healing
- Acts on the root cause of post-operative pain
- Central figure that can reign in pain and facilitate the effectiveness of other companion tools
- Critical component to a successful outcome
- Absence makes effective pain management more difficult



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

The NSAIDs



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Managing the Limitations

Bleeding concerns

- COX-1 inhibition reduces fortification of stomach lining & platelet aggregation
- Greatest clinical implication is GI bleeding: duration & age are risk factors

Renal concerns

- Prostaglandin inhibition → renal vasoconstriction → hypoperfusion
- Greatest risk with longer duration of use

Cardiovascular concerns

- Renal hypoperfusion leads to fluid imbalance → symptom exacerbation



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

Acetaminophen



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- Centrally acting pain reliever believed to modulate COX activity
- True mechanism of action is still not well understood
- Clinical effect results from diminished volume of pain transmissions in the CNS that can be processed in the cerebral cortex

- Reliable adjunct tool that optimizes the effect of companion medications in a pain management regimen

- Be thoughtful in patients with known or suspected hepatic disease



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

Regional Blocks



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- Local anesthetics enveloping a nerve target to block formation and propagation of nerve impulses in the peripheral nervous system
- Provides prolonged interruption of pain signal information in the periphery
- Clinical effect results from diminished volume of pain signal transmissions entering the CNS for eventual processing at the cerebral cortex
- Bupivacaine & lidocaine are workhorses providing 16-24 hr of coverage in the typical time of the most intense post-operative pain



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

Regional Blocks



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Managing the Limitations

Underlying Medical Conditions

- Excessive plasma concentrations can lead to altered mental state and/or seizures
- Caution in patients with cardiovascular issues → electrolyte modulation → potassium anomalies → dysrhythmias leading to cardiac arrest

Post-operative concerns

- Masking pain perception can be catastrophic in compartment syndrome formation

General Safety Note

- Toxicity correlates to plasma concentrations → typically below toxic levels with a properly placed block

Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

The Long-Acting Opioids



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- Opioid mu-receptor agonists leading to a cascade that results in diminished appreciation of pain intensity
- Most common agents used clinically include oxycodone & morphine
- Practical clinical application acts to mask the volume of pain patients feel and perceive
- THERE IS NO IMPACT ON ANY CAUSATIVE FACTOR

- Works to mount a prolonged barrier to intense pain signals impacting the cerebral cortex
- Later line of defense and commonly employed post-operatively to reduce the amount of pain patients manage immediately after surgery



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

The Immediate-Acting Opioids



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- Opioid mu-receptor agonists leading to a cascade that results in diminished appreciation of pain intensity
- Most common agents used clinically include oxycodone & hydrocodone containing products
- Practical clinical application acts to mask the volume of pain patients feel and perceive when signaling persists through other modes of treatment
- REMEMBER, THERE IS NO IMPACT ON ANY CAUSATIVE FACTOR
- Commonly used in conjunction with acetaminophen
- Optimal as a last line of defense and commonly employed post-operatively to reduce the amount of pain patients manage immediately after surgery



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

Managing the Limitations & Concerns Around Opioids

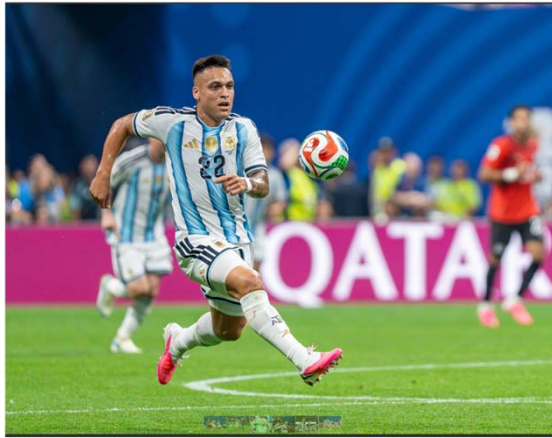
- Factors leading to use disorders: Tolerance → Dependence → Abuse/Addiction → Death
- Common Adverse Events: Nausea/Vomiting; Constipation; Lethargy
 - ↳ Suboptimal Rehabilitation & Recovery
- Extended duration of reliance leading to excessive refills, readmissions & SUD treatment
- Diminished performance on quality measures → reimbursement penalties
- Increased risk for societal/community harm including diversion



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

Gabapentanoids



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- Common medications: gabapentin & pregabalin
- Known to impact inhibitory nerve activity by GABA mimicry or calcium flux
- Developed as a class of agents to treat seizures and found largely off-label applications as a pain therapy
- Most effective use is over a duration of time, and titration is necessary to reach an effective dose while managing adverse event profile



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

Gabapentanoids



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Managing the Limitations of the Gabapentinoids

- Questionable utility in the acute setting mirrors complicated use in chronic conditions
- Titration to optimal therapeutic dosing may take too long to cover the needed acute phase
- Side effect profile is significant for a lot of patients and features nerve related consequences: lethargy can complicate rehabilitation & recovery



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Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

Suzetrigine



Image courtesy of Rafsan The Sports Buzz & Instagram

- Non-opioid analgesic – novel development and first in a class
- Inhibits sodium channel function selectively at the NaV 1.8 subtype known to exist in the dorsal root ganglia of the PNS
- Developed as a new class of analgesics to provide outcomes driven pain relief without impacting the mu-receptors and mitigating risks of using opioids
- Pragmatically, this medication is closest in function to local anesthetics and can be thought of as affecting an “oral block”



Applying the Scaloni Strategy

Identify the tools best suited for the task & leverage them for success

Suzetrigine



Image courtesy of Rafsan The Sports Buzz & Instagram

Implications of suzetrigine's entrance into the pain space

- Selectivity for the NaV 1.8 sodium channel targets pain signaling while eliminating activity at the 1.4 & 1.5 subtypes – cardiac adverse events
- Longer half-life and onset of action requires loading doses with subsequent scheduled dosing: 100mg initial dose followed by 50mg every 12 hours until pain no longer necessitates (maximum of 14-day course)
- Liver function is key for dose adjustment: none needed for Child-Pugh class A, adjust in Class B; avoid use in Class C; CYP3A4 mediated adjustment



POLL QUESTION #1

Which of the following pain relief options exerts its effect by mitigating a root cause of acute pain?

- A. Acetaminophen
- B. Gabapentin
- C. Long-acting Opioids
- D. Non-steroidal Anti-inflammatory Agents (NSAIDs)



Let's Optimize Pain Management Tools

Making them work effectively for our patients



Optimizing Pain Management Tools

Find the best use of each element

The NSAIDs



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- Suggest making the NSAIDs the anchor of a pain management plan
- Use them to control inflammation and operate on the root cause
- Allows you to employ all the other tools around it to augment the effect
- Think of them as acute tools and underscore that for patients
- Can be leveraged in two use strategies:
 - PRN: ibuprofen or OTC naproxen (220mg tabs)
 - PRN use can validate the utility of controlling inflammation

- Scheduled: celecoxib, diclofenac, Rx naproxen (multiple strengths)
- Baseline reliable management of inflammation



Optimizing Pain Management Tools

Find the best use of each element

Acetaminophen



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- Best to use as a modulator and teach patients it reduces the volume of pain signals making it to your brain
- This is the rationale for use in combination medications with opioids
- Reliable tool in a pain strategy with proven results at reducing the amount of opioid medication patients use
- OTC status sometimes leaves patients questioning the power: validating the importance may be crucial when educating patients
- Can leverage different dosing strategies:
 - PRN is the most common with doses of 650 to 1000mg
 - Scheduled dosing has application: often 1000mg TID



Optimizing Pain Management Tools

Find the best use of each element

Regional Blocks



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- Consider the pain implications of your procedure, especially the point of greatest intensity
- A central strategy for cases where diminished nerve function and pain signaling will not diminish the quality of early rehabilitation & recovery
- Leverage the input of your colleagues in regional anesthesia to optimize single-shot, neuraxial & continuous infiltration approaches
- Be aware of longer acting local anesthetic strategies: other institutions deploy liposomal bupivacaine

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Optimizing Pain Management Tools

Find the best use of each element

Where do the Opioids Fit?

THEY DO FIT IN A MULTIMODAL PAIN STRATEGY

- Patients are concerned about safety issues and fear can drive decision making
- Decide where opioids have utility and provide your patients with that perspective
- Immediate acting opioids can help patients manage pain that impairs functionality in recovery
- Give careful consideration to the use of long-acting opioid – benefit in high volume pain in the early stage of recovery



Optimizing Pain Management Tools

Find the best use of each element

The Long-Acting Opioids



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- Use long-acting opioids when there is a substantial need to interrupt the perception of pain for a limited period
- Remember opioid activity will impact the dopamine pathway along with the mu receptors in the CNS
- Prolonged exposure will give rise to tolerance and dependence and place a patient at risk for a substance use disorder
- Consider using long-acting agents in surgeries with substantial pain volume and/or situations where early high-quality rehabilitation is key to recovery
- Be thoughtful about the use of these agents and consider the possibility of using other strategies
- Long-acting agents will not replace immediate acting agents



Optimizing Pain Management Tools

Find the best use of each element

The Immediate-Acting Opioids



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- Immediate acting opioids remain a viable option in the toolbox for helping patients manage pain
- Range dosing can be employed including use of half-tablet strategies: use caution because acetaminophen at doses below 325mg may not be effective
- Fear and concern remains in the patient population: best to focus education on helping patients understand the utility as an agent to help patients move forward in recovery when functional ability is compromised
- Emphasize the short-term application of opioids in general and the immediate acting medications



Optimizing Pain Management Tools

Find the best use of each element

Suzetrigine



Image courtesy of Rafsan The Sports Buzz & Instagram

WHERE DOES THE NEW OPTION FIT?

- Let's think about what it does and where it has utility
- Sodium channel modulation makes its utility comparable to a block
- Pharmacokinetics rule it out as a PRN option with routine dosing providing the greatest benefit
- Suggestion: think of this agent as an option to affect a sensory block over an extended duration of time
- Greatest potential utility is to provide an alternative approach to long-acting opioids – WILL NOT REPLACE IMMEDIATE ACTING AGENTS
- Regional blocks will last 16-24 hours, so be thoughtful about initiation

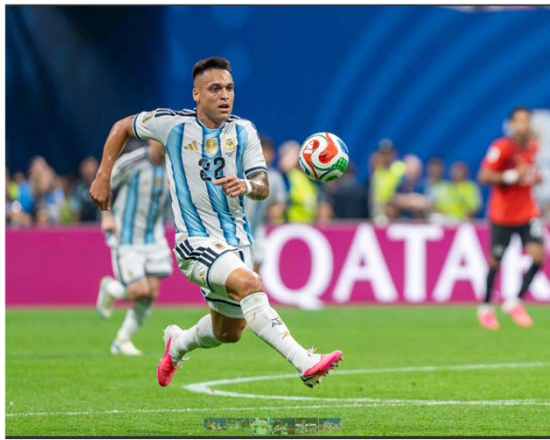


Optimizing Pain Management Tools

Find the best use of each element

Gabapentanoids

WHERE DO THESE AGENTS FIT?



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- Subject of significant debate amongst surgeons and pain management clinicians
- Side effect profile and need for dose titration can limit the utility of gabapentinoids in the post-operative phase
- May have utility in the run-up to surgery especially in circumstances where there is impact on nerve function

- Emerging interest lies in using them as a pre-operative adjunct strategy with the growing belief that it may affect acute de-sensitization

- **BOTTOM LINE:** Use them strategically where a rationale for benefit makes sense – they do have place in the calculus of pain management



POLL QUESTION #2

Which medication is a novel oral agent indicated to treat moderate to severe acute pain by acting on voltage-gated sodium channels?

- A. Suzetrigine (Journavx®)
- B. Diclofenac gel (Voltaren®)
- C. Pregabalin (Lyrica®)
- D. Bupivacaine & meloxicam injection (Zynrelef®)



Optimizing Pain Management Tools

Find the best use of each element

Physical Modalities

- Leverage the non-pharmacologic options to manage pain
- Ice and pressure are key tools to control swelling and inflammation
- Determine the best use of ice and pressure in the recovery process
- Talk with patients about the appropriate time to begin using these tools



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Optimizing Pain Management Tools

Find the best use of each element

Crafting the optimal strategy to manage a patient's post-operative pain

1. Consider the implications of anti-inflammatory treatment & optimize the tool based on the patient's circumstances and the nature of the procedure
2. Make a determination about the approach to acetaminophen and leverage the tool
3. Have a PRN option that is not an opioid medication
4. Determine how to incorporate the use of blocks for adjunct management
5. Assess the need for opioids and the need for long-acting agents with a plan to prescribe the fewest dose units needed
6. Review the strategy for the possibility of using opioid alternatives and/or secondary adjunct meds
7. Educate patients on the strategy and how to be a partner in executing the approach



Optimizing Pain Management Tools

Find the best use of each element

Educate patients to assess their functionality to guide pain management

1. Are you able to get out of bed?
2. Are you able to move around with whatever limitations come from surgery?
3. Are you able to use the bathroom?
4. Are you able to eat something?
5. Are you able to make reasonable progress through your day?
6. Are you able to get some sleep?
7. When you're awake and recovering, are you a reasonable person to be around?



Optimizing Pain Management Tools

Find the best use of each element

- Educate patients to assess their functionality to guide pain management
- If they can say yes to all 7 dimensions, an opioid is not the PRN option
- Take a PRN opioid when they answer no to one or more dimensions
- Re-assess functionality at the prescribed opioid interval (usual q 4-6hr)
- For functional pain, assess pressure and stiffness
- If PRN NSAIDs are ordered, this is the tool for pressure & stiffness
- Pain without pressure and stiffness → PRN acetaminophen



POLL QUESTION #3

Which statement best describes a successful multimodal pain management strategy?

- A. Encourage the use of opioids when pain becomes significant
- B. Identify an anchor tool such as an NSAID and build around it
- C. Adopt new strategies as early as possible to address patients' concerns
- D. Focus opioid treatment on long-acting agents to eliminate immediate-acting formulations



Time for Domingo Asado

Todas Gracias al Asador, Antonio: La Estancia El Ombu, San Antonio de Areco, PBA, Argentina



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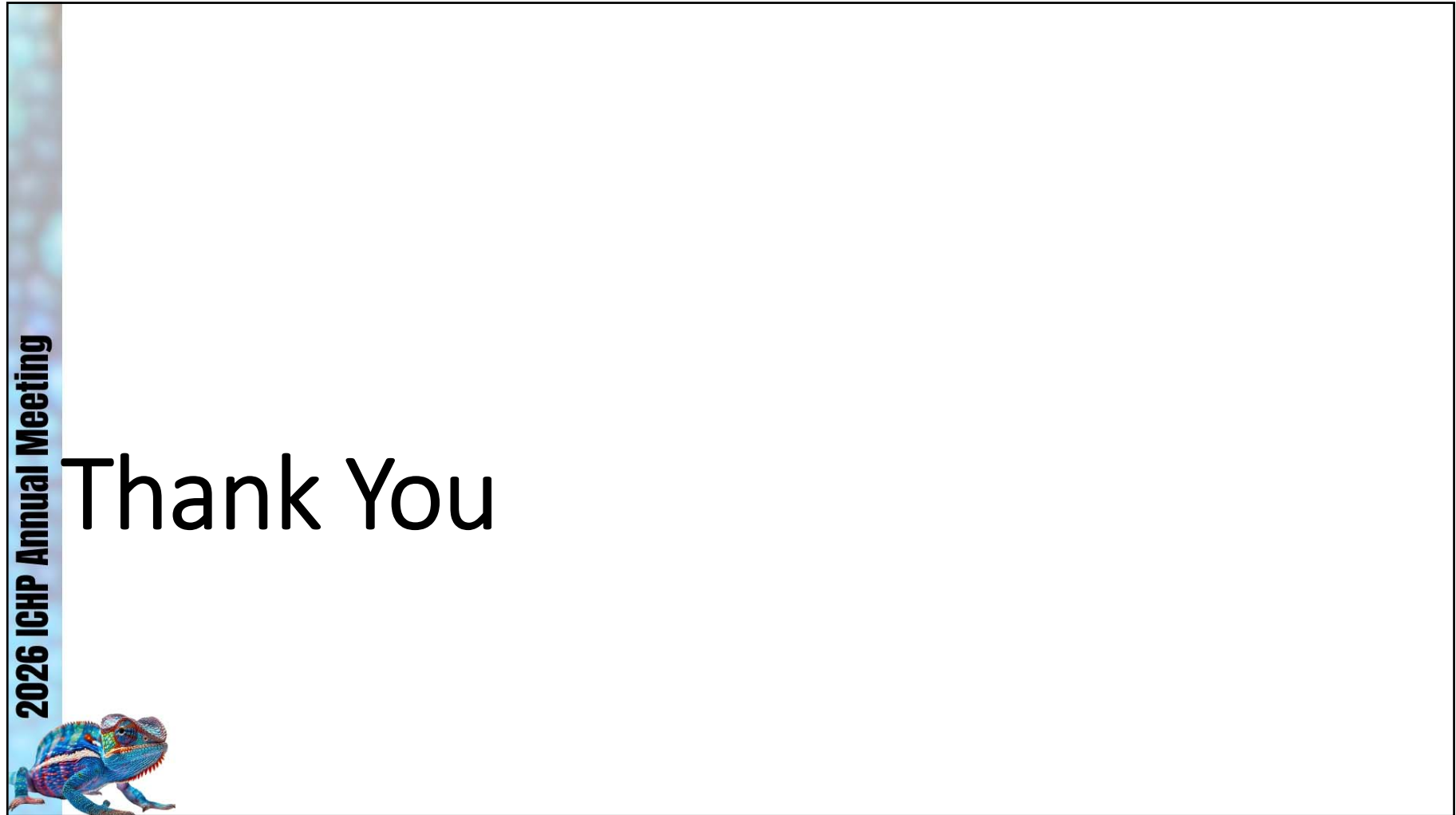


Questions?

CE Code: X1792

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POLL QUESTION #4

Extra credit: Which iconic footballer IS the Greatest of All Time (G.O.A.T)?

- A. Cristiano Renaldo (Portugal)
- B. Diego Maradona (Argentina)
- C. Lionel Messi (Argentina)
- D. Edson Arantes do Nascimento aka Pele (Brazil)



POLL QUESTION #4

The extra credit answer is:

C

Plain and simple, Lionel (Leo) Messi is the king of all footballers! It may be hundreds of years before we see another player with better skills.



Multi-modal Pain Management

Crafting a Results-Oriented Pragmatic Approach

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