

Editorial

Corresponding author

Jerry Jones, MD

Assistant Professor
College of Medicine
Department of Anesthesiology
UTHSC, Memphis, TN, USA
E-mail: jjones2086@gmail.com

Volume 2 : Issue 1

Article Ref. #: 1000AOJ2e002

Article History

Received: March 17th, 2017

Accepted: March 21st, 2017

Published: March 27th, 2017

Citation

Jones J. The importance of optimizing acute post-surgical pain. *Res Pract Anesthesiol Open J.* 2017; 2(1): e1-e4. doi: [10.17140/RPAOJ-2-e002](https://doi.org/10.17140/RPAOJ-2-e002)

Copyright

©2017 Jones J. This is an open access article distributed under the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The Importance of Optimizing Acute Post-Surgical Pain

Jerry Jones, MD*

Department of Anesthesiology, College of Medicine, UTHSC, Memphis, TN, USA

In February 1992, AHCPR released a clinical practice guideline¹ to help surgeons, nurses, and anesthesiologists manage acute post-operative pain more effectively. The guideline was developed by an 18-member private-sector panel of pain experts. The multidisciplinary panel reviewed the research literature on pain management to develop the scientific base for the guideline. The guidelines indicate that unrelieved pain causes suffering, can lead to other health problems, and delays recovery, thereby adding unnecessarily to health care costs. The acute pain management guideline had four major goals:

- To reduce the incidence and severity of acute post-operative or post-traumatic pain
- To educate patients about the need to communicate about their unrelieved pain
- To enhance patient comfort and satisfaction
- To reduce post-operative complications and, in some cases, shorten stays after surgical procedures

The panel arrived at a number of conclusions at that time; however, some assertions have been refuted or questioned²⁻⁶ in recent years:

- Half of all patients given conventional therapy for their pain-most of the 23 million surgical cases each year-do not get adequate relief. These patients continue to feel moderate to severe pain
- Giving patient's pain medicine only "as needed" can result in prolonged delays because patients may delay asking for help
- Aggressive prevention of pain is better than treatment because, once established, pain is more difficult to suppress
- Patients have a right to treatment that includes prevention of or adequate relief from pain. Physicians need to develop pain control plans before surgery and inform the patient what to expect in terms of pain during and after surgery
- Fears of postsurgical addiction to opioids are generally groundless²
- Patient-controlled medication via infusion pumps is safe³⁻⁶

Primary messages that came out of this guideline include the idea that the patients have a 'right' to pain treatment and that recognizing and more thoroughly treating acute pain management will result in less suffering, improved recovery and positive financial consequences. The Joint Commission on Accreditation of Healthcare Organizations then came out with new standards for pain assessment, monitoring and treatment in 2001 as a condition of accreditation.⁷ The 2000's became the decade where patient satisfaction and treating every subjective complaint of pain became the new standard.

This increased emphasis on treating patient complaints of pain along with the loosening of concerns regarding the risk of addiction lead to an astronomical increase in opioid prescriptions paralleling an increase in the incidence of opioid addiction.⁸ There were also reports of increases (from 11 to 24.5 per 100,000) in serious opioid-related adverse drug events (ORADE's) after the implementation of policies and standards reflecting this expanded emphasis.⁹

Despite these and other guidelines that have come out since that time, acute pain management continues to be poorly managed as reflected in many patient satisfaction studies.¹⁰⁻¹⁴ Further, despite the availability of newer modalities that have been repeatedly shown to significantly improve post-operative pain control, optimize patient recovery parameters, and obviate the potentially very serious consequences of ORADE's, reliance on opioid monotherapy remains the most commonly prescribed regimen in the United States (US).

Beyond the life-threatening ORADE's, it is now recognized that surgical patients experiencing moderate to severe ORADE's have significant increases in length of stay (LOS) as well as an increase in overall hospital costs. Even a single episode of a relatively minor ORADE has been found to be associated with an average 1/2 day increase in length of stay and an increase in costs of \$840 in hospitalized patients.¹⁵ Another study indicates that ORADE's increase LOS by 10.3% and costs by 7.4% in surgical patients, and higher doses of opioids (10 mg morphine) are associated with experiencing ORADE's.¹⁶ A recent retrospective study of 319,898 selected surgical patients (moderately painful procedures) found that 12.2% experienced ORADE's and incurred an estimated additional mean cost and LOS difference of \$4,707 and 3.3 days when compared to similar patients who did not have an ORADE. These patients were also more likely to be total cost outliers, length of stay outliers and to be readmitted.¹⁷ Interestingly, the dose of opioid that is associated with a greater likelihood of ORADE is relatively small, particularly when given intravenously. In a retrospective study evaluating the influence of intravenous opioid dosing on the incidence of post-operative ileus (POI) in colectomy patients, Barletta et al¹⁸ found that 2 mg or more of hydromorphone per day was the dose measure most associated with experiencing a POI. This dose was also significantly associated with having an increased LOS. The added cost from a POI-related increase in LOS was recently estimated to be \$8,300.¹⁹

The American Society of Anesthesiologists (ASA) published in 2012 an updated (from 1995 & 2004) practice guidelines for acute pain management in the peri-operative setting²⁰ which was developed from current literature, expert opinion and randomly selected ASA member opinion. These guidelines emphasize the importance of developing institutional policies and procedures for the evaluation and management of peri-operative pain, obtaining a directed pain history and peri-operative patient education, employing advanced peri-operative pain management techniques as well as multimodal analgesia (MMA), and recognizing and addressing certain patient subpopulations that are at increased risk of experiencing post-operative pain. A summary of their recommendations includes:

- Ongoing education and training of hospital personnel regarding the effective and safe use of the available treatment options within the institution
- Use standardized, validated instruments to facilitate the regular evaluation and documentation of pain intensity, the ef-

- fects of pain therapy, and side effects caused by the therapy
- Twenty four hour access to hospital staff and surgeons to address peri-operative pain management within the context of an integrated Acute Pain Service (APS) to minimize 'analgesic gaps'
- Avoid ordering analgesic modalities 'as needed'
- Whenever possible, use MMA techniques including:
 - COXIBs, Non-selective NSAIDS, Acetaminophen, gabapentin/pre-gabalin
 - Regional blockade with local anesthetics should be considered as part of a multimodal approach
- Unless contraindicated, all patients should receive an around-the-clock regimen of NSAIDS, COXIBs, or acetaminophen
- Pediatric and geriatric patients are at increased risk for complications due to their acute pain therapies
- Critically ill and cognitively impaired patients are subpopulations who require additional interventions to ensure optimal pain management

An exhaustive and thorough discussion on the importance of evaluating and optimizing acute pain as well as how to implement a system-wide approach to acute pain management was developed by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) in 2012 as well.²¹ It includes a discussion of many of the prevailing forces within the current healthcare market that are mounting (including HCAHPS & Value-Based Purchasing) that are creating the necessity for hospitals to optimize acute pain management. The details of this resource are beyond the scope of this supplement, but their 8 critical components are:

- Use of National Pain Standards
- Commitment of a Senior Leader Champion
- Consistent Oversight of a Pain Project Manager
- Collaboration of the Interdisciplinary Team
- Provision of Systemic Performance Improvement Methodology
- Provision of a Pain Management Infrastructure
- Promotion of the Patient's Continuous Learning
- Transition of Care for all Stakeholders

More recently, The American Pain Society, in collaboration with The American Society of Regional Anesthesia and the American Society of Anesthesiologists, recently published guidelines on the management of post-operative pain.²² The panel echoes many of the recommendations of the updated practice guidelines from the ASA Task Force on Acute Pain Management²⁰ though it does so in greater detail. For example, they recommend that clinicians offer multimodal analgesia including gabapentin, acetaminophen and/or nonsteroidal anti-inflammatory drugs in the treatment of post-operative pain in patients without contraindications, but they go on to recommend the use of non-pharmacologic therapies (TENS and cognitive-behavioral therapy, for example). As another example, instead of only suggesting that local anesthetic techniques should be considered per the ASA Guidelines, clinicians are recommended

to consider surgical site infiltration of local anesthetics, local anesthetic-based peripheral regional anesthetic techniques and continuous peripheral regional analgesic techniques when the need for analgesia is likely to exceed the duration of effect of a single injection. They recommend the routine use of NSAID's and Acetaminophen for all patients without contraindications as they each have opioid-sparing properties which are different, and their combined use may be superior to either alone. The American Pain Society Guidelines go on to recommend the use of additional agents such as ketamine, IV lidocaine and clonidine with single injection nerve blocks when appropriate.

Further, oral opioids are recommended over IV opioids in patients who can use the oral routes. Specific recommendations are also made regarding patients on long-term opioid therapy including pain specialty consultation. Further, the panel recommends that facilities in which surgery is performed provide clinicians with access to consultation with a pain specialist for any patient with inadequately controlled post-operative pain or who is at high risk of inadequately controlled post-operative pain (e.g., opioid-tolerant, history of substance abuse) (strong recommendation, low-quality evidence).

Of particular importance, recommendations for adequate monitoring for sedation and respiratory depression for patients receiving systemic opioids are also described. Although they state that pulse oximetry is often utilized in patients at risk for opioid-induced respiratory depression, it is an insensitive and relatively late monitor in detecting respiratory depression, particularly when supplemental oxygen is being delivered. Regular clinical assessments of sedation and respiratory effort likely remain the most reliable monitor for respiratory depression. Continuous capnography may become a more useful monitor; however, there are insufficient studies at present.

Facilities are recommended to have an organized structure in place to develop and refine policies and processes for safe and effective delivery of post-operative pain control. Facilities should also provide clinicians with access to pain specialists for patients who have inadequately controlled post-operative pain or who are at risk for having poorly controlled post-operative pain.

It is particularly important to identify patients at increased risk for serious ORADE's such as over-sedation and respiratory depression. Special attention to opioid-sparing multimodal analgesia should be employed in particular with this patient population, and additional monitoring is important when opioids are required. The August 2012, Joint Commission Sentinel Event Alert #49 titled 'Safe use of opioids in hospitals'²³ addresses this issue and identifies patients at increased risk. Their report estimates that the incidence of post-operative respiratory depression is 0.5% of patients, but this estimate is likely lower than the actual incidence as the occurrence rates in clinical trials are higher. Of the ORADE's that appear in their database (including deaths), 47% were wrong dose medication errors, 29% were related to improper monitoring of the patient, and 11% were related to other factors.

Characteristics of patients who are at higher risk for over-sedation and respiratory depression:

- Sleep apnea or sleep disorder diagnosis
- Morbid obesity with high risk of sleep apnea
- Snoring
- Older age; risk is:
 - 2.8 times higher for individuals aged 61-70
 - 5.4 times higher for age 71-80
 - 8.7 times higher for those over age 805,12,20
- No recent opioid use
- Post-surgery, particularly if upper abdominal or thoracic surgery
- Increased opioid dose requirement 6 or opioid habituation
- Longer length of time receiving general anesthesia during surgery
- Receiving other sedating drugs, such as benzodiazepines, antihistamines, diphenhydramine, sedatives, or other central nervous system depressants
- Pre-existing pulmonary or cardiac disease or dysfunction or major organ failure
- Thoracic or other surgical incisions that may impair breathing
- Smoker

As with other patients, analgesic regimens should be tailored to the individual patient and scaled up or down as needs change. This approach mirrors the World Health Organization's (WHO) stepwise approach to pain management.²⁴

REFERENCES

1. Acute Pain Management Guideline Panel. Acute pain management: Operative or medical procedures and trauma. Rockville, MD: Agency for Health Care Policy and Research, Public Health Service, U.S. Department of Health and Human Services; 1992.
2. Alam A, Gomes T, Zheng H, Mamdani MM, et al. Long-term analgesic use after low-risk surgery: A retrospective cohort study. *Arch Intern Med.* 2012; 172(5): 425-430. doi: [10.1001/archinternmed.2011.1827](https://doi.org/10.1001/archinternmed.2011.1827)
3. Cashman JN, Dolin SJ. Respiratory and haemodynamic effects of acute postoperative pain management: Evidence from published data. *Br J Anaesth.* 2004; 93(2): 212-223. doi: [10.1093/bja/aeh180](https://doi.org/10.1093/bja/aeh180)
4. Hicks RW, Sikirica V, Nelson W, Schein JR, Cousins DD. Medication errors involving patient-controlled analgesia. *Am J Health Syst Pharm.* 2008; 65(5): 429-440. doi: [10.2146/ajhp070194](https://doi.org/10.2146/ajhp070194)
5. Vincente KJ, Kada-Bekhaled K, Hillel G, et al. Programming errors contribute to deaths from patient-controlled analgesia: Case report and estimate of probability. *Can J Anaesth.* 2003;

- 50(4): 328-332. doi: [10.1007/BF03021027](https://doi.org/10.1007/BF03021027)
6. Overdyk FJ, Dowling O, Marino J, et al. Association of opioids and sedatives with increased risk of in-hospital cardiopulmonary arrest from an administrative database. *PLoS ONE*. 2016; 11(2): e0150214. doi: [10.1371/journal.pone.0150214](https://doi.org/10.1371/journal.pone.0150214)
7. Phillips DM. JCAHO pain management standards are unveiled. *JAMA*. 2000; 284(4): 4-5. doi: [10.1001/jama.284.4.423b](https://doi.org/10.1001/jama.284.4.423b)
8. National Vital Statistics System, 1999-2008; Automation of Reports and Consolidated Orders System (ARCOS) of the Drug Enforcement Administration (DEA), 1999-2010; Treatment Episode Data Set, 1999-2009
9. Vila H Jr, Smith RA, Augustyniak MJ, et al. The efficacy and safety of pain management before and after implementation of hospital-wide pain management standards: Is patient safety compromised by treatment based solely on numerical pain ratings? *Anesth Analg*. 2005; 101: 474-480. doi: [10.1213/01.ANE.0000155970.45321.A8](https://doi.org/10.1213/01.ANE.0000155970.45321.A8)
10. Warfield CA, Kahn CH. Acute pain management: Programs in U.S. hospitals and experiences and attitudes among U.S. adults. *Anesthesiology*. 1995; 83(5): 1019-1094. Web site: <http://anesthesiology.pubs.asahq.org/article.aspx?articleid=2323522>. Accessed March 16, 2017.
11. Wu CL, Berenholtz SM, Pronovost PJ, Fleisher LA. Systematic review and analysis of postdischarge symptoms after outpatient surgery. *Anesthesiology*. 2002; 96(4): 994-1003. Web site: <http://anesthesiology.pubs.asahq.org/article.aspx?articleid=1944937>. Accessed March 16, 2017.
12. Apfelbaum JL, Chen C, Mehta SS, Gan TJ. Postoperative pain experience: Results from a national survey suggest postoperative pain continues to be undermanaged. *Anesth Analg*. 2003; 97(2): 534-540. doi: [10.1213/01.ANE.0000068822.10113.9E](https://doi.org/10.1213/01.ANE.0000068822.10113.9E)
13. McGrath B, Elgendy H, Chung F, Kamming D, Curti B, King S. Thirty percent of patients have moderate to severe pain 24 hours after ambulatory surgery: A survey of 5,703 patients. *Can J Anaesth*. 2004; 51(9): 886-891. doi: [10.1007/BF03018885](https://doi.org/10.1007/BF03018885)
14. Gan TJ, Habib AS, Miller TE, White W, Apfelbaum JL. Incidence, patient satisfaction, and perceptions of post-surgical pain: Results from a US national survey. *Curr Med Res Opin*. 2014; 30(1): 5149-5160. doi: [10.1185/03007995.2013.860019](https://doi.org/10.1185/03007995.2013.860019)
15. Oderda GM, Evans RS, Lloyd J, et al. The cost of opioid-related adverse drug events in surgical patients. *J Pain Symptom Manage*. 2003; 25(3): 276-283. doi: [10.1016/S0885-3924\(02\)00691-7](https://doi.org/10.1016/S0885-3924(02)00691-7)
16. Oderda GM, Said Q, Evans RS, et al. Opioid related adverse drug events in surgical hospitalizations: Impact on cost and length of stay. *Ann Pharmacother*. 2007; 41(3): 400-407. Web site: http://journals.sagepub.com/doi/abs/10.1345/aph.1H386?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed. Accessed March 16, 2017.
17. Oderda GM, Gan TJ, Johnson BH, Robinson SB. Effect of opioid-related adverse drug events on outcomes in selected surgical patients. *J Pain Palliat Care Pharmacother*. 2013; 27(1): 62-70. doi: [10.3109/15360288.2012.751956](https://doi.org/10.3109/15360288.2012.751956)
18. Barletta JF, Asgeirsson T, Senagore AJ. Influence of intravenous opioid dose on postoperative ileus. *Ann Pharmacother*. 2011; 45(7-8): 916-923. doi: [10.1345/aph.1Q041](https://doi.org/10.1345/aph.1Q041)
19. Asgeirsson T, El-Badawi KI, Mahmood A, Barletta J, Luchtefeld M, Senagore AJ. Postoperative ileus: It costs more than you expect. *J Am Coll Surg*. 2010; 210(2): 228-231. doi: [10.1016/j.jamcollsurg.2009.09.028](https://doi.org/10.1016/j.jamcollsurg.2009.09.028)
20. American Society of Anesthesiologists Task Force on Acute Pain Management. Practice guidelines for acute pain management in the perioperative setting an updated report by the american society of anesthesiologists task force on acute pain management. *Anesthesiology*. 2012; 116(2): 248-273. doi: [10.1097/ALN.0b013e31823c1030](https://doi.org/10.1097/ALN.0b013e31823c1030)
21. Joint Commission Resources Joint Commission on Accreditation of Healthcare Organizations Pain Management: A Systems Approach to Improving Quality and Safety. 2012.
22. Chou R, Gordon DB, de Leon-Casasola OA, et al. Guidelines on the management of post-operative Pain. *J Pain*. 2016; 17(2): 131-157. doi: [10.1016/j.jpain.2015.12.008](https://doi.org/10.1016/j.jpain.2015.12.008)
23. The Joint Commission Sentinel Event Alert , Issue 49, Safe use of opioids in hospitals August 8, 2012.
24. World Health Organization. Pain relief ladder. Web site: <http://www.who.int/cancer/palliative/painladder/en>. Accessed March 16, 2017.