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

PRACTICE guidelines are systematically developed recommendations that assist the practitioner and patient in making decisions about health care. These recommendations may be adopted, modified, or rejected according to clinical needs and constraints, and are not intended to replace local institutional policies. In addition, practice guidelines developed by the American Society of Anesthesiologists (ASA) are not intended as standards or absolute requirements, and their use cannot guarantee any specific outcome. Practice guidelines are subject to revision as warranted by the evolution of medical knowledge, technology, and practice. They provide basic recommendations that are supported by a synthesis and analysis of the current literature, expert and practitioner opinion, open forum commentary, and clinical feasibility data.


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Methodology

A. Definition of Acute Pain Management in the Perioperative Setting

For these Guidelines, acute pain is defined as pain that is present in a surgical patient after a procedure. Such pain may be the result of trauma from the procedure or procedure-related complications. Pain management in the perioperative setting refers to actions before, during, and after a procedure that are intended to reduce or eliminate postoperative pain before discharge.

B. Purposes of the Guidelines

The purpose of these Guidelines is to (1) facilitate the safety and effectiveness of acute pain management in the perioperative setting; (2) reduce the risk of adverse outcomes; (3) maintain the patient’s functional abilities, as well as physical and psychological well-being; and (4) enhance the quality of life for patients with acute pain during the perioperative period. Adverse outcomes that may result from the undertreatment of perioperative pain include (but are not limited to) thromboembolic and pulmonary complications, additional time spent in an intensive care unit or hospital, hospital readmission for further pain management, needless suffering, impairment of health-related quality of life, and development of chronic pain. Adverse outcomes associated with the management of perioperative pain include (but are not limited to) respiratory depression, brain or other neurologic injury, sedation, circulatory depression, nausea, vomiting, pruritus, urinary retention, impairment of bowel function, and sleep disruption. Health-related quality of life includes (but is not limited to) physical, emotional, social, and spiritual well-being.

C. Focus

These Guidelines focus on acute pain management in the perioperative setting for adult (including geriatric) and pediatric patients undergoing either inpatient or outpatient surgery. Modalities for perioperative pain management addressed in these Guidelines require a higher level of professional expertise and organizational structure than "as needed" intramuscular or intravenous
injections of opioid analgesics. These Guidelines are not intended as an exhaustive compendium of specific techniques.

Patients with severe or concurrent medical illness such as sickle cell crisis, pancreatitis, or acute pain related to cancer or cancer treatment may also benefit from aggressive pain control. Labor pain is another condition of interest to anesthesiologists. However, the complex interactions of concurrent medical therapies and physiologic alterations make it impractical to address pain management for these populations within the context of this document.

While patients undergoing painful procedures may benefit from the appropriate use of anxiolytics and sedatives in combination with analgesics and local anesthetics when indicated, these guidelines do not specifically address the use of anxiolysis or sedation during such procedures.

**D. Application**

These Guidelines are intended for use by anesthesiologists and individuals who deliver care under the supervision of anesthesiologists. The Guidelines may also serve as a resource for other physicians and health care professionals who manage perioperative pain. In addition, these Guidelines are intended for use by policymakers to promote effective and patient-centered care.

Anesthesiologists bring an exceptional level of interest and expertise to the area of perioperative pain management. Anesthesiologists are uniquely qualified and positioned to provide leadership in integrating pain management within perioperative care. In this leadership role, anesthesiologists improve quality of care by developing and directing institution-wide, interdisciplinary perioperative analgesia programs.

**E. Task Force Members and Consultants**

The original Guidelines were developed by an ASA appointed task force of 11 members, consisting of anesthesiologists in private and academic practices from various geographic areas of the United States, and two consulting methodologists from the ASA Committee on Standards and Practice Parameters.
The Task Force updated the Guidelines by means of a seven-step process. First, they reached consensus on the criteria for evidence. Second, original published research studies from peer-reviewed journals relevant to acute pain management were reviewed and evaluated. Third, expert consultants were asked to: (1) participate in opinion surveys on the effectiveness of various acute pain management recommendations and (2) review and comment on a draft of the updated Guidelines. Fourth, opinions about the updated Guideline recommendations were solicited from a sample of active members of the ASA. Fifth, opinion-based information obtained during an open forum for the original Guidelines, held at a major national meeting, was re-examined. Sixth, the consultants were surveyed to assess their opinions on the feasibility of implementing the updated Guidelines. Seventh, all available information was used to build consensus to finalize the updated Guidelines.

F. Availability and Strength of Evidence

Preparation of these Guidelines followed a rigorous methodological process. Evidence was obtained from two principal sources: scientific evidence and opinion-based evidence.

Scientific Evidence:

Study findings from published scientific literature were aggregated and are reported in summary form by evidence category, as described below. All literature (e.g., randomized controlled trials, observational studies, case reports) relevant to each topic was considered when evaluating the findings. However, for reporting purposes in this document, only the highest level of evidence (i.e., level 1, 2, or 3 within category A, B, or C, as identified below) is included in the summary.

Category A: Supportive Literature. Randomized controlled trials report statistically significant (p < 0.01) differences between clinical interventions for a specified clinical outcome.

Level 1: The literature contains multiple randomized controlled trials, and aggregated findings are supported by meta-analysis.\(^\S\)

Level 2: The literature contains multiple randomized controlled trials, but the number of studies is insufficient to conduct a viable meta-analysis for the purpose of these Guidelines.

Level 3: The literature contains a single randomized controlled trial.

\textit{Category B: Suggestive Literature.} Information from observational studies permits inference of beneficial or harmful relationships among clinical interventions and clinical outcomes.

Level 1: The literature contains observational comparisons (\textit{e.g.,} cohort, case-control research designs) of clinical interventions or conditions and indicates statistically significant differences between clinical interventions for a specified clinical outcome.

Level 2: The literature contains non-comparative observational studies with associative (\textit{e.g.,} relative risk, correlation) or descriptive statistics.

Level 3: The literature contains case reports.

\textit{Category C: Equivocal Literature.} The literature cannot determine whether there are beneficial or harmful relationships among clinical interventions and clinical outcomes.

Level 1: Meta-analysis did not find significant differences (\(p > 0.01\)) among groups or conditions.

Level 2: The number of studies is insufficient to conduct meta-analysis, and (1) randomized controlled trials have not found significant differences among groups or conditions or (2) randomized controlled trials report inconsistent findings.

Level 3: Observational studies report inconsistent findings or do \textit{not} permit inference of beneficial or harmful relationships.

\textit{Category D: Insufficient Evidence from Literature.} The lack of scientific evidence in the literature is described by the following terms.

\(^\S\) All meta-analyses are conducted by the ASA methodology group. Meta-analyses from other sources are reviewed but not included as evidence in this document.
Inadequate: The available literature cannot be used to assess relationships among clinical interventions and clinical outcomes. The literature either does not meet the criteria for content as defined in the “Focus” of the Guidelines or does not permit a clear interpretation of findings due to methodological concerns (e.g., confounding in study design or implementation).

Silent: No identified studies address the specified relationships among interventions and outcomes.

**Opinion-Based Evidence:**

All opinion-based evidence (e.g., survey data, open-forum testimony, Internet-based comments, letters, editorials) relevant to each topic was considered in the development of these updated Guidelines. However, only the findings obtained from formal surveys are reported.

Opinion surveys were developed for this update by the Task Force to address each clinical intervention identified in the document. Identical surveys were distributed to expert consultants and ASA members.

*Category A: Expert Opinion.* Survey responses from Task Force-appointed expert consultants are reported in summary form in the text, with a complete listing of consultant survey responses reported in an appendix.

*Category B: Membership Opinion.* Survey responses from active ASA members are reported in summary form in the text, with a complete listing of ASA member survey responses reported in an appendix.

Survey responses are recorded using a 5-point scale and summarized based on median values. **

<table>
<thead>
<tr>
<th>Category</th>
<th>Median Score</th>
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<tbody>
<tr>
<td>Strongly Agree</td>
<td>Median score of 5 (At least 50% of the responses are 5)</td>
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<tr>
<td>Agree</td>
<td>Median score of 4 (At least 50% of the responses are 4 or 4 and 5)</td>
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<tr>
<td>Equivocal</td>
<td>Median score of 3 (At least 50% of the responses are 3, or no other response category or combination of similar categories contain at least 50% of the responses)</td>
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<tr>
<td>Disagree</td>
<td>Median score of 2 (At least 50% of responses are 2 or 1 and 2)</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>Median score of 1 (At least 50% of responses are 1)</td>
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**When an equal number of categorically distinct responses are obtained, the median value is determined by calculating the arithmetic mean of the two middle values. Ties are calculated by a predetermined formula**
Category C: Informal Opinion. Open-forum testimony from the previous update, Internet-based comments, letters and editorials are all informally evaluated and discussed during the development of Guideline recommendations. When warranted, the Task Force may add educational information or cautionary notes based on this information.

Guidelines:


Institutional policies and procedures include (but are not limited to) (1) education and training for health care providers, (2) monitoring of patient outcomes, (3) documentation of monitoring activities, (4) monitoring of outcomes at an institutional level, (5) 24-h availability of anesthesiologists providing perioperative pain management, and (6) use of a dedicated acute pain service.

Observational studies report that education and training programs for health care providers are associated with decreased pain levels,\(^1\)\(^-\)\(^4\) decreased nausea and vomiting,\(^2\) and improved patient satisfaction,\(^1\) (Category B2 evidence) although the type of education and training provided varied across the studies. Published evidence is insufficient to evaluate the impact of monitoring patient outcomes at either the individual patient or institutional level, and the 24-h availability of anesthesiologists. (Category D evidence) Observational studies assessing documentation activities suggest that pain outcomes are not fully documented in patient records.\(^5\)\(^-\)\(^11\) (Category B2 evidence) Observational studies indicate that acute pain services are associated with reductions in perioperative pain,\(^12\)\(^-\)\(^20\) (Category B2 evidence) although treatment components of the acute pain services varied across the studies.

The consultants and ASA members strongly agree that anesthesiologists offering perioperative analgesia services should provide, in collaboration with other health care professionals as
appropriate, ongoing education and training of hospital personnel regarding the effective and safe
use of the available treatment options within the institution. The consultants and ASA members also
strongly agree that anesthesiologists and other health care providers should use standardized,
validated instruments to facilitate the regular evaluation and documentation of pain intensity, the
effects of pain therapy, and side effects caused by the therapy. The ASA members agree and the
consultants strongly agree that: (1) anesthesiologists responsible for perioperative analgesia should
be available at all times to consult with ward nurses, surgeons, or other involved physicians, and
should assist in evaluating patients who are experiencing problems with any aspect of perioperative
pain relief; (2) anesthesiologists should provide analgesia services within the framework of an Acute
Pain Service, and participate in developing standardized institutional policies and procedures; and
(3) an integrated approach to perioperative pain management (e.g., ordering, administering, and
transitioning therapies, transferring responsibility for pain therapy, outcomes assessment, continuous
quality improvement) should be used to minimize analgesic gaps.

**Recommendations for institutional policies and procedures:** Anesthesiologists offering
perioperative analgesia services should provide, in collaboration with other health care professionals
as appropriate, ongoing education and training to ensure that hospital personnel are knowledgeable
and skilled with regard to the effective and safe use of the available treatment options within the
institution. Educational content should range from basic bedside pain assessment to sophisticated
pain management techniques (e.g., epidural analgesia, patient controlled analgesia, and various
regional anesthesia techniques) and non-pharmacologic techniques (e.g., relaxation, imagery,
hypnotic methods). For optimal pain management, ongoing education and training are essential for
new personnel, to maintain skills, and whenever therapeutic approaches are modified.

Anesthesiologists and other health care providers should use standardized, validated instruments
to facilitate the regular evaluation and documentation of pain intensity, the effects of pain therapy,
and side effects caused by the therapy.
Analgesic techniques involve risk for adverse effects that may require prompt medical evaluation. Anesthesiologists responsible for perioperative analgesia should be available at all times to consult with ward nurses, surgeons, or other involved physicians, and should assist in evaluating patients who are experiencing problems with any aspect of perioperative pain relief.

Anesthesiologists providing perioperative analgesia services should do so within the framework of an Acute Pain Service, and participate in developing standardized institutional policies and procedures. An integrated approach to perioperative pain management that minimizes analgesic gaps includes ordering, administering, and transitioning therapies, and transferring responsibility for perioperative pain therapy, as well as outcomes assessment and continuous quality improvement.

II. Preoperative Evaluation of the Patient

Preoperative patient evaluation and planning is integral to perioperative pain management. Proactive individualized planning is an anticipatory strategy for postoperative analgesia that integrates pain management into the perioperative care of patients. Patient factors to consider in formulating a plan include type of surgery, expected severity of postoperative pain, underlying medical conditions (e.g., presence of respiratory or cardiac disease, allergies), the risk-benefit ratio for the available techniques, and a patient’s preferences or previous experience with pain.

Although the literature is insufficient regarding the efficacy of a preoperative directed pain history, a directed physical examination, or consultations with other health care providers, the Task Force points out the obvious value of these activities. (Category D evidence) One observational study in a neonatal intensive care unit suggests that the implementation of a pain management protocol may be associated with reduced analgesic use, shorter time to extubation, and shorter times to discharge. (Category B2 evidence)

The ASA members agree and the consultants strongly agree that a directed history, a directed physical examination, and a pain control plan should be included in the anesthetic preoperative evaluation.
**Recommendations for preoperative evaluation of the patient:** A directed pain history, a directed physical examination, and a pain control plan should be included in the anesthetic preoperative evaluation.

**III. Preoperative Preparation of the Patient**

Preoperative patient preparation includes (1) adjustment or continuation of medications whose sudden cessation may provoke a withdrawal syndrome, (2) treatments to reduce preexisting pain and anxiety, (3) premedications prior to surgery as part of a multimodal analgesic pain management program, and (4) patient and family education, including behavioral pain control techniques.

There is insufficient literature to evaluate the impact of preoperative adjustment or continuation of medications whose sudden cessation may provoke an abstinence syndrome. *(Category D evidence)* Similarly, there is insufficient literature to evaluate the efficacy of the preoperative initiation of treatment either to reduce preexisting pain or as part of a multimodal analgesic pain management program. *(Category D evidence)* Randomized controlled trials (RCTs) are equivocal regarding the impact of patient and family education on patient pain, analgesic use, anxiety, and time to discharge, *(Category C2 evidence)* although features of patient and family education varied across the studies.22-35

The consultants and ASA members strongly agree that patient preparation for perioperative pain management should include appropriate adjustments or continuation of medications to avert an abstinence syndrome, treatment of preexistent pain, or preoperative initiation of therapy for postoperative pain management. The ASA members agree and the consultants strongly agree that anesthesiologists offering perioperative analgesia services should provide, in collaboration with others as appropriate, patient and family education; and the consultants and ASA members agree that perioperative patient education should include instruction in behavioral modalities for control of pain and anxiety.
**Recommendations for preoperative preparation of the patient:**

Patient preparation for perioperative pain management should include appropriate adjustments or continuation of medications to avert an abstinence syndrome, treatment of preexistent pain, or preoperative initiation of therapy for postoperative pain management.

Anesthesiologists offering perioperative analgesia services should provide, in collaboration with others as appropriate, patient and family education regarding their important roles in achieving comfort, reporting pain, and in proper use of the recommended analgesic methods. Common misconceptions that overestimate the risk of adverse effects and addiction should be dispelled.

Patient education for optimal use of patient-controlled analgesia (PCA) and other sophisticated methods, such as patient-controlled epidural analgesia (PCEA), might include discussion of these analgesic methods at the time of the preanesthetic evaluation, brochures and videotapes to educate patients about therapeutic options, and discussion at the bedside during postoperative visits. Such education may also include instruction in behavioral modalities for control of pain and anxiety.

**IV. Perioperative Techniques for Pain Management**

Perioperative techniques for postoperative pain management include, but are not limited to the following single modalities: (1) central regional (*i.e.*, neuraxial) opioid analgesia; (2) PCA with systemic opioids; and (3) peripheral regional analgesic techniques, including but not limited to intercostal blocks, plexus blocks, and local anesthetic infiltration of incisions.

**Central regional opioid analgesia:**

Randomized controlled trials report improved pain relief when use of preincisional epidural or intrathecal morphine is compared with preincisional oral, intravenous or intramuscular morphine. Randomized controlled trials comparing preoperative or preincisional intrathecal morphine or epidural sufentanil with saline placebo report inconsistent findings regarding pain relief. Randomized controlled trials comparing preoperative or
preincisional epidural morphine or fentanyl with postoperative epidural morphine or fentanyl are equivocal regarding postoperative pain scores.\textsuperscript{44-45} (Category C2 evidence)

Meta-analysis of RCTs\textsuperscript{46-54} report improved pain relief and increased frequency of pruritus when comparing postincisional epidural morphine with saline placebo; (Category A1 evidence) findings for the frequency of nausea and vomiting were equivocal. (Category C1 evidence) Meta-analysis of RCTs comparing postincisional epidural morphine with intramuscular morphine report improved pain relief and an increased frequency of pruritus.\textsuperscript{55-60} (Category A1 evidence) One RCT reports improved pain scores and less analgesic use when postincisional intrathecal fentanyl is compared with no postincisional spinal treatment.\textsuperscript{61} (Category A3 evidence)

One RCT reports improved pain scores when postoperative epidural morphine is compared with postoperative epidural saline.\textsuperscript{62} (Category A3 evidence) Meta-analysis of RCTs\textsuperscript{63-71} report improved pain score and a higher frequency of pruritus and urinary retention when postoperative epidural morphine is compared with intramuscular morphine; (Category A3 evidence) findings for nausea and vomiting are equivocal. (Category C2 evidence) RCTs\textsuperscript{72-75} are equivocal regarding the analgesic efficacy of postoperative epidural fentanyl compared to postoperative IV fentanyl; (Category C2 evidence) and meta-analytic findings are equivocal for nausea/vomiting and pruritus.\textsuperscript{73-77} (Category C1 evidence)

**PCA with systemic opioids:**

Randomized controlled trials report equivocal findings regarding the analgesic efficacy of IV PCA techniques when compared with nurse or staff-administered intravenous analgesia.\textsuperscript{78-81} (Category C2 evidence) Meta-analysis of RCTs report improved pain scores when IV PCA morphine is compared with intramuscular morphine.\textsuperscript{82-89} (Category A1 evidence) Findings from meta-analysis of RCTs comparing epidural PCA and IV PCA opioids are equivocal regarding analgesic efficacy.\textsuperscript{90-94} (Category C1 evidence) Findings from meta-analyses of RCTs\textsuperscript{95-104} indicate more analgesic use when IV PCA with a background infusion of morphine is compared with IV
PCA without a background infusion; (Category A1 evidence) findings were equivocal regarding pain relief, nausea/vomiting, pruritus, and sedation. (Category C1 evidence)

**Peripheral regional techniques:**

For these Guidelines, peripheral regional techniques include peripheral nerve blocks, (e.g., intercostal, ilioinguinal, interpleural or plexus blocks), intraarticular blocks, and infiltration of incisions. Randomized controlled trials indicate that preincisional intercostal or interpleural bupivacaine compared with saline is associated with improved pain relief.\(^{105-106}\) (Category A2 evidence) Randomized controlled trials report improved pain relief and reduced analgesic consumption when postincisional intercostal or interpleural bupivacaine is compared with saline.\(^{105-110}\) (Category A2 evidence) Meta-analysis of RCTs report equivocal findings for pain relief and analgesic used when postoperative intercostal or interpleural blocks are compared with saline.\(^{111-118}\) (Category C1 evidence)

Randomized controlled trials report equivocal pain relief findings when preincisional plexus blocks with bupivacaine are compared with saline.\(^{119-122}\) (Category C2 evidence) Meta-analysis of RCTs report less analgesic use when preincisional plexus blocks with bupivacaine are compared to saline;\(^{119-123}\) (Category A1 evidence) findings are equivocal for nausea/vomiting. (Category C1 evidence) Meta-analysis of RCTs report lower pain scores use when preincisional plexus and other blocks are compared with no block.\(^{124-128}\) (Category A1 evidence) Randomized controlled trials report equivocal findings for pain scores and analgesic use when postincisional plexus and other blocks are compared with saline or no block.\(^{129-134}\) (Category C2 evidence) Randomized controlled trials report equivocal findings for pain scores and analgesic use when postincisional intraarticular opioids or local anesthetics are compared with saline.\(^{135-143}\) (Category C2 evidence) Meta-analysis of RCTs report improved pain scores when preincisional infiltration of bupivacaine is compared with saline;\(^{144-152}\) (Category A1 evidence) findings for analgesic use are equivocal.\(^{144, 149, 151, 152-154}\) (Category C1 evidence) Meta-analysis of RCTs are equivocal for pain
scores and analgesic use when postincisional infiltration of bupivacaine is compared with saline.\textsuperscript{155} (\textit{Category C2 evidence}) Meta-analysis of RCTs report equivocal pain score findings when preincisional infiltration of bupivacaine is compared with postincisional infiltration of bupivacaine.\textsuperscript{166-171} (\textit{Category C2 evidence}) Meta-analysis of RCTs report improved pain scores and reduced analgesic use when preincisional infiltration of ropivacaine is compared with saline;\textsuperscript{172-178} (\textit{Category A1 evidence})

The consultants and ASA members strongly agree that anesthesiologists who manage perioperative pain should utilize therapeutic options such as epidural or intrathecal opioids, systemic opioid PCA, and regional techniques, after thoughtfully considering the risks and benefits for the individual patient; they also strongly agree that these modalities should be used in preference to intramuscular opioids ordered “as needed.” The consultants and ASA members also strongly agree that the therapy selected should reflect the individual anesthesiologist’s expertise, as well as the capacity for safe application of the modality in each practice setting. Moreover, the consultants and ASA members strongly agree that special caution should be taken when continuous infusion modalities are used, as drug accumulation may contribute to adverse events.

\textbf{Recommendations for perioperative techniques for pain management:}

Anesthesiologists who manage perioperative pain should utilize therapeutic options such as central regional (\textit{i.e.}, neuraxial) opioids, systemic opioid PCA, and peripheral regional techniques, after thoughtfully considering the risks and benefits for the individual patient. These modalities should be used in preference to intramuscular opioids ordered “as needed.” The therapy selected should reflect the individual anesthesiologist’s expertise, as well as the capacity for safe application of the modality in each practice setting. This capacity includes the ability to recognize and treat adverse effects that emerge after initiation of therapy. Special caution should be taken when continuous infusion modalities are used, as drug accumulation may contribute to adverse events.
Multimodal techniques for pain management include the administration of two or more drugs that act by different mechanisms for providing analgesia. These drugs may be administered via the same route or by different routes.

**Multimodal techniques with central regional analgesics:**

Meta-analyses of RCTs report improved pain scores (Category A1 evidence) and equivocal findings for nausea/vomiting and pruritus (Category C1 evidence) when epidural morphine combined with local anesthetics is compared to epidural morphine alone. Meta-analyses of RCTs report improved pain scores and more motor weakness when epidural fentanyl combined with local anesthetics is compared with epidural fentanyl alone; (Category A1 evidence) equivocal findings are reported for nausea/vomiting and pruritus. (Category C1 evidence) Meta-analysis of RCTs report improved pain scores, greater pain relief, and a higher frequency of pruritus (Category A1 evidence) when epidural morphine combined with bupivacaine is compared with epidural bupivacaine alone; equivocal findings are reported for nausea/vomiting. (Category C1 evidence) Randomized controlled trials report equivocal findings when epidural fentanyl combined with bupivacaine is compared with epidural bupivacaine alone. (Category C2 evidence) Meta-analysis of RCTs for the above comparison report higher frequency of pruritus with equivocal findings for nausea/vomiting. (Category C2 evidence) Randomized controlled trials report equivocal findings for pain scores, nausea/vomiting, pruritus, and motor weakness when epidural fentanyl with ropivacaine is compared with epidural ropivacaine. (Category C2 evidence) Meta-analysis of RCTs is equivocal for pain scores (Category C2 evidence) and a higher frequency of pruritus when epidural sufentanil combined with ropivacaine is compared with epidural ropivacaine. (Category A1 evidence) Meta-analysis of RCTs is equivocal for pain scores when epidural opioids combined with clonidine is compared with epidural opioids.
Multimodal techniques with systemic analgesics:

Meta-analysis of RCTs\textsuperscript{230-237} report improved pain scores and reduced analgesic use (\textit{Category A1 evidence}) when intravenous morphine combined with ketorolac is compared with intravenous morphine; equivocal findings are reported for nausea/vomiting. (\textit{Category C1 evidence}) Meta-analysis of RCTs\textsuperscript{238-243} report equivocal findings for pain scores, analgesic use or nausea scores when intravenous morphine combined with ketamine is compared with intravenous morphine. (\textit{Category C1 evidence}) Randomized controlled trials report inconsistent findings for pain scores and morphine use when intravenous patient-controlled opioid analgesia (IV PCA) combined with oral COX-2 selective NSAIDs\textsuperscript{244,245} or non-selective NSAIDs\textsuperscript{246,247} are compared with IV PCA opioids alone; findings for acetaminophen are equivocal.\textsuperscript{248} (\textit{Category C2 evidence}) Meta-analysis of RCTs report lower pain scores and reduced opioid use when IV opioids combined with calcium channel blockers (\textit{i.e.}, gabapentin, pregabalin) is compared with IV opioids alone\textsuperscript{249-258} (\textit{Category A1 evidence}); no difference in nausea or vomiting are reported.\textsuperscript{251-254,256,259} (\textit{Category C1 evidence})

The consultants and ASA members strongly agree that whenever possible, anesthesiologists should employ multimodal pain management therapy. The ASA members agree and the consultants strongly agree that acetaminophen should be considered as part of a postoperative multimodal pain management regime; while both the consultants and ASA members agree that COX-2 selective NSAIDs (COXIBs), nonselective NSAIDs, and calcium channel alpha-2-delta antagonists (gabapentin and pregabalin) should be considered as part of a postoperative multimodal pain management regime. Moreover, the ASA members agree and the consultants strongly agree that unless contraindicated, patients should receive an around-the-clock regimen of NSAIDs, COXIBs, or acetaminophen. Both the consultants and ASA members strongly agree that (1) regional blockade with local anesthetics should be considered as part of a multimodal approach for pain management; (2) dosing regimens should be administered to optimize efficacy while minimizing the risk of
adverse events; and (3) the choice of medication, dose, route, and duration of therapy should be
individualized.

**Recommendations for multimodal techniques:**

Whenever possible, anesthesiologists should employ multimodal pain management therapy. Central regional blockade with local anesthetics should be considered. Unless contraindicated, patients should receive an around-the-clock regimen of COXIBs, NSAIDs, or acetaminophen. Dosing regimens should be administered to optimize efficacy while minimizing the risk of adverse events. The choice of medication, dose, route, and duration of therapy should be individualized.

VI. Patient Subpopulations

Some patient groups are at special risk for inadequate pain control, and require additional analgesic considerations. Patient populations at risk include (1) pediatric patients, (2) geriatric patients, and (3) critically ill or cognitively impaired patients, or other patients who may have difficulty communicating. The Task Force believes that genetics and gender modify the pain experience and response to analgesic therapies. In addition, the Task Force believes that patient race, ethnicity, culture, gender, and socioeconomic status influence access to treatment as well as pain assessment by health care providers.

**Pediatric Patients:** The Task Force believes that optimal care for infants and children (including adolescents) requires special attention to the biopsychosocial nature of pain. This specific patient population presents developmental differences in their experience and expression of pain and suffering, and their response to analgesic pharmacotherapy. Caregivers in both the home and hospital may have misperceptions regarding the importance of analgesia as well as its risks and benefits. In the absence of a clear source of pain or obvious pain behavior, caregivers may assume that pain is not present, and defer treatment. Safe methods for providing analgesia are underutilized in pediatric patients for fear of opioid-induced respiratory depression.
The emotional component of pain is particularly strong in infants and children. Absence of parents, security objects, and familiar surroundings may cause as much suffering as the surgical incision. Children’s fear of injections makes intramuscular or other invasive routes of drug delivery aversive. Even the valuable technique of topical analgesia prior to injections may not lessen this fear.

A variety of techniques may be effective in providing analgesia in pediatric patients. Many are the same as for adults, although some (e.g., caudal analgesia) are more commonly used in children. The Task Force believes that it is important for caregivers to recognize that pediatric patients require special consideration to ensure optimal perioperative analgesia.

The ASA members and consultants strongly agree that (1) perioperative care for children undergoing painful procedures or surgery requires developmentally appropriate pain assessment and therapy and (2) analgesic therapy should depend upon age, weight, and comorbidity, and unless contraindicated should involve a multimodal approach; and (3) as many analgesic medications are synergistic with sedating agents, it is imperative that appropriate monitoring be employed during the procedure and recovery. The ASA members agree and the consultants strongly agree that behavioral techniques, especially important in addressing the emotional component of pain, should be applied whenever feasible.

**Recommendations for pediatric patients:**

Aggressive and proactive pain management is necessary to overcome the historic undertreatment of pain in children. Perioperative care for children undergoing painful procedures or surgery requires developmentally appropriate pain assessment and therapy. Analgesic therapy should depend upon age, weight, and comorbidity, and unless contraindicated should involve a multimodal approach. Behavioral techniques, especially important in addressing the emotional component of pain, should be applied whenever feasible.
Sedative, analgesic, and local anesthetics are all important components of appropriate analgesic regimens for painful procedures. As many analgesic medications are synergistic with sedating agents, it is imperative that appropriate monitoring be employed during the procedure and recovery.

**Geriatric Patients:** Elderly patients suffer from conditions such as arthritis or cancer that render them more likely to undergo surgery. The Task Force believes that pain is often undertreated, and elderly individuals may be more vulnerable to the detrimental effects of such undertreatment. The physical, social, emotional, and cognitive changes associated with aging have an impact on perioperative pain management. These patients may have different attitudes than younger adult patients in expressing pain and seeking appropriate therapy. Altered physiology changes the way analgesic drugs and local anesthetics are distributed and metabolized, and frequently requires dose alterations. Techniques effective in younger adults may also benefit geriatric patients without an age-related increase in adverse effects. One observational study suggests that perioperative analgesics are provided in lower dosages to older adults than to younger adults.\(^{260}\) \(\text{(Category B2 evidence)}\) The Task Force believes that, although the reasons for lower perioperative analgesic doses in the elderly are unclear, undertreatment of pain in elderly persons is widespread.

The ASA members and consultants strongly agree that (1) pain assessment and therapy should be integrated into the perioperative care of geriatric patients; (2) pain assessment tools appropriate to a patient’s cognitive abilities should be employed; and (3) dose titration should be done to ensure adequate treatment while avoiding adverse effects such as somnolence in this vulnerable group, who may be taking other medications. The ASA members agree and the consultants strongly agree that extensive and proactive evaluation and questioning should be conducted to overcome barriers that hinder communication regarding unrelieved pain; and

**Recommendations for geriatric patients:**

Pain assessment and therapy should be integrated into the perioperative care of geriatric patients. Pain assessment tools appropriate to a patient’s cognitive abilities should be employed. Extensive
and proactive evaluation and questioning may be necessary to overcome barriers that hinder communication regarding unrelieved pain. Anesthesiologists should recognize that geriatric patients may respond differently than younger patients to pain and analgesic medications, often because of comorbidity. Vigilant dose titration is necessary to ensure adequate treatment while avoiding adverse effects such as somnolence in this vulnerable group, who are often taking other medications (including alternative and complementary agents).

**Other Subpopulations:**

Patients who are critically ill, cognitively impaired (e.g., Alzheimer’s disease) or who otherwise have difficulty communicating (e.g., cultural or language barriers) present unique challenges to perioperative pain management. The Task Force believes that techniques that reduce drug dosages required to provide effective analgesia (e.g., regional analgesia and multimodal analgesia) may be suitable for such patients. Behavioral modalities and techniques such as PCA that depend upon self-administration of analgesics are generally less suitable for the cognitively impaired. The literature is insufficient to evaluate the application of pain assessment methods or pain management techniques specific to these populations. (*Category D evidence*)

The consultants and ASA members strongly agree that anesthesiologists should recognize that patients who are critically ill, cognitively impaired, or have communication difficulties may require additional interventions to ensure optimal perioperative pain management. Moreover, the ASA members agree and the consultants strongly agree that anesthesiologists should consider a therapeutic trial of an analgesic in patients with elevated blood pressure and heart rate or agitated behavior, when causes other than pain have been excluded.

**Recommendations for other subpopulations.**

Anesthesiologists should recognize that patients who are critically ill, cognitively impaired, or have communication difficulties may require additional interventions to ensure optimal perioperative pain management. Anesthesiologists should consider a therapeutic trial of an analgesic in patients...
with elevated blood pressure and heart rate or agitated behavior, when causes other than pain have been excluded.
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Appendix I: Summary of Recommendations


- Anesthesiologists offering perioperative analgesia services should provide, in collaboration with other health care professionals as appropriate, ongoing education and training to ensure that hospital personnel are knowledgeable and skilled with regard to the effective and safe use of the available treatment options within the institution.
  - Educational content should range from basic bedside pain assessment to sophisticated pain management techniques (e.g., epidural analgesia, patient controlled analgesia, and various regional anesthesia techniques) and non-pharmacologic techniques (e.g., relaxation, imagery, hypnotic methods).
  - For optimal pain management, ongoing education and training are essential for new personnel, to maintain skills, and whenever therapeutic approaches are modified.
- Anesthesiologists and other health care providers should use standardized, validated instruments to facilitate the regular evaluation and documentation of pain intensity, the effects of pain therapy, and side effects caused by the therapy.
- Anesthesiologists responsible for perioperative analgesia should be available at all times to consult with ward nurses, surgeons, or other involved physicians.
  - They should assist in evaluating patients who are experiencing problems with any aspect of perioperative pain relief.
- Anesthesiologists providing perioperative analgesia services should do so within the framework of an Acute Pain Service.
  - They should participate in developing standardized institutional policies and procedures.

II. Preoperative Evaluation of the Patient

- A directed pain history, a directed physical examination, and a pain control plan should be included in the anesthetic preoperative evaluation.

III. Preoperative Preparation of the Patient

- Patient preparation for perioperative pain management should include appropriate adjustments or continuation of medications to avert an abstinence syndrome, treatment of preexistent pain, or preoperative initiation of therapy for postoperative pain management.
- Anesthesiologists offering perioperative analgesia services should provide, in collaboration with others as appropriate, patient and family education regarding their important roles in achieving comfort, reporting pain, and in proper use of the recommended analgesic methods.
  - Common misconceptions that overestimate the risk of adverse effects and addiction should be dispelled.
  - Patient education for optimal use of patient-controlled analgesia (PCA) and other sophisticated methods, such as patient-controlled epidural analgesia (PCEA), might include discussion of these analgesic methods at the time of the preanesthetic evaluation, brochures and videotapes to educate patients about therapeutic options, and discussion at the bedside during postoperative visits.
  - Such education may also include instruction in behavioral modalities for control of pain and anxiety.
IV. Perioperative Techniques for Pain Management

- Anesthesiologists who manage perioperative pain should utilize therapeutic options such as epidural or intrathecal opioids, systemic opioid PCA, and regional techniques, after thoughtfully considering the risks and benefits for the individual patient.
  - These modalities should be used in preference to intramuscular opioids ordered “as needed.”
- The therapy selected should reflect the individual anesthesiologist’s expertise, as well as the capacity for safe application of the modality in each practice setting.
  - This capacity includes the ability to recognize and treat adverse effects that emerge after initiation of therapy.
- Special caution should be taken when continuous infusion modalities are used, as drug accumulation may contribute to adverse events.

V. Multimodal Techniques for Pain Management

- Whenever possible, anesthesiologists should employ multimodal pain management therapy.
  - Unless contraindicated, patients should receive an around-the-clock regimen of NSAIDs, COXIBs, or acetaminophen.
  - Regional blockade with local anesthetics should be considered.
- Dosing regimens should be administered to optimize efficacy while minimizing the risk of adverse events.
- The choice of medication, dose, route, and duration of therapy should be individualized.

V. Patient Subpopulations

- Pediatric patients
  - Aggressive and proactive pain management is necessary to overcome the historic undertreatment of pain in children.
  - Perioperative care for children undergoing painful procedures or surgery requires developmentally appropriate pain assessment and therapy.
  - Analgesic therapy should depend upon age, weight, and comorbidity, and unless contraindicated should involve a multimodal approach.
  - Behavioral techniques, especially important in addressing the emotional component of pain, should be applied whenever feasible.
  - Sedative, analgesic, and local anesthetics are all important components of appropriate analgesic regimens for painful procedures.
  - As many analgesic medications are synergistic with sedating agents, it is imperative that appropriate monitoring be employed during the procedure and recovery
- Geriatric patients
  - Pain assessment and therapy should be integrated into the perioperative care of geriatric patients.
  - Pain assessment tools appropriate to a patient’s cognitive abilities should be employed. Extensive and proactive evaluation and questioning may be necessary to overcome barriers that hinder communication regarding unrelieved pain.
  - Anesthesiologists should recognize that geriatric patients may respond differently than younger patients to pain and analgesic medications, often because of comorbidity.
Vigilant dose titration is necessary to ensure adequate treatment while avoiding adverse effects such as somnolence in this vulnerable group, who are often taking other medications (including alternative and complementary agents).

- Other subpopulations
  - Anesthesiologists should recognize that patients who are critically ill, cognitively impaired, or have communication difficulties may require additional interventions to ensure optimal perioperative pain management.
  - Anesthesiologists should consider a therapeutic trial of an analgesic in patients with elevated blood pressure and heart rate or agitated behavior, when causes other than pain have been excluded.
Appendix 2: Methods and Analyses

A. State of the Literature.

For these updated Guidelines, a review of studies used in the development of the original Guidelines was combined with studies published subsequent to approval of the original Guidelines in 2003.†† The scientific assessment of these Guidelines was based on evidence linkages or statements regarding potential relationships between clinical interventions and outcomes. The interventions listed below were examined to assess their relationship to a variety of outcomes related to the management of acute pain in the perioperative setting.

Institutional Policies and Procedures for Providing Perioperative Pain Management:

- Education and training of health care providers
- Monitoring of patient outcomes
- Documentation of monitoring activities
- Monitoring of outcomes at an institutional level
- 24 hr availability of anesthesiologists providing perioperative pain management
- Acute pain service

Preoperative Evaluation of the Patient:

- A directed pain history (e.g., medical record review and patient interview to include current medications, adverse effects, preexisting pain conditions, medical conditions that would influence a pain therapy, nonpharmacologic pain therapies, alternative and complimentary therapies)
- A directed physical examination
- Consultations with other health-care providers (e.g., nurses, surgeons, pharmacists)

Preoperative Preparation of the Patient:

- Preoperative adjustment or continuation of medications whose sudden cessation may provoke an abstinence syndrome
- Preoperative treatment(s) to reduce preexisting pain and anxiety
- Premedication(s) prior to surgery as part of a multimodal analgesic pain management program
- Patient and family education

Perioperative Techniques for Pain Management:

- Epidural or intrathecal analgesia with opioids (versus epidural placebo, epidural local anesthetics, or IV, IM, or oral opioids)
- Patient-controlled analgesia with opioids

IV PCA versus nurse-controlled or continuous IV
IV PCA versus IM
 Epidural PCA versus epidural bolus or infusion
 Epidural PCA versus IV PCA
 Epidural PCA with background infusion of opioids versus no background infusion
Regional analgesia with local anesthetics or opioids
 Intercostal or interpleural blocks
 Plexus and other blocks
 Intraarticular opioids, local anesthetics or combinations
 Infiltration of incisions

**Multimodal Techniques (Epidural, IV, or Regional Techniques)**

Two or more analgesic agents, one route versus a single agent, one route
 Epidural or intrathecal analgesia with opioids combined with:
   - Local anesthetics *versus* epidural opioids
   - Local anesthetics *versus* epidural local anesthetics
   - Clonidine *versus* epidural opioids
 IV opioids combined with:
   - Clonidine *versus* IV opioids
   - Ketorolac *versus* IV opioids
   - Ketamine *versus* IV opioids
 Oral opioids combined with NSAIDs, COXIBs, or acetaminophen versus oral opioids
 Two or more drug delivery routes versus a single route
 Epidural or intrathecal analgesia with opioids combined with IV, IM, oral, transdermal or subcutaneous analgesics versus epidural opioids
 IV opioids combined with oral NSAIDs, COXIBs, or acetaminophen versus IV opioids
 Non-pharmacologic, alternative or complementary pain management combined with pharmacologic pain management versus pharmacologic pain management

**Special patient populations**

Pain management techniques for pediatric patients
 Pain assessment techniques
 Dose level adjustments
 Avoidance of repetitive diagnostic evaluation (heel sticks) for neonates
 Pain management techniques for geriatric patients
 Pain assessment techniques
 Dose level adjustments
 Pain management techniques for other special populations (*e.g.*, cognitively impaired, critically ill, patients with difficulty communicating)
 Pain assessment methods specific to special populations
 Pain management techniques specific to special populations

For the literature review, potentially relevant clinical studies were identified via electronic and manual searches of the literature. The electronic and manual searches covered a 43-yr period from 1963 through 2011. More than 2000 citations were initially identified, yielding a total of 1784 non-overlapping articles that addressed topics related to the evidence linkages. After review of the
articles, 1152 studies did not provide direct evidence, and were subsequently eliminated. A total of
632 articles contained direct linkage-related evidence. A complete bibliography used to develop
these Guidelines, organized by section, is available as Supplemental Digital Content 2,
http://links.lww.com____.

Initially, each pertinent outcome reported in a study was classified as supporting an evidence
linkage, refuting a linkage, or equivocal. The results were then summarized to obtain a directional
assessment for each evidence linkage before conducting formal meta-analyses. Literature pertaining
to 4 evidence linkage categories contained enough studies with well-defined experimental designs
and statistical information sufficient for meta-analyses (Table 1). These linkages were: 1) epidural
or intrathecal opioids, 2) patient-controlled analgesia, 3) regional analgesia, and 4) two or more
anesthetic drugs versus a single drug.

General variance-based effect-size estimates or combined probability tests were obtained for
continuous outcome measures, and Mantel-Haenszel odds-ratios were obtained for dichotomous
outcome measures. Two combined probability tests were employed as follows: (1) the Fisher
combined test, producing chi-square values based on logarithmic transformations of the reported P
values from the independent studies, and (2) the Stouffer combined test, providing weighted
representation of the studies by weighting each of the standard normal deviates by the size of the
sample. An odds-ratio procedure based on the Mantel-Haenszel method for combining study results
using 2 x 2 tables was used with outcome frequency information. An acceptable significance level
was set at P < 0.01 (one-tailed). Tests for heterogeneity of the independent studies were conducted
to assure consistency among the study results. DerSimonian-Laird random-effects odds ratios were
obtained when significant heterogeneity was found (P < 0.01). To control for potential publishing
bias, a "fail-safe n" value was calculated. No search for unpublished studies was conducted, and no
reliability tests for locating research results were done. To be accepted as significant findings,
Mantel-Haenszel odds-ratios must agree with combined test results whenever both types of data are
assessed. In the absence of Mantel-Haenszel odds-ratios, findings from both the Fisher and weighted Stouffer combined tests must agree with each other to be acceptable as significant.

For the previous update of the Guidelines, interobserver agreement among Task Force members and two methodologists was established by interrater reliability testing. Agreement levels using a kappa (k) statistic for two-rater agreement pairs were as follows: (1) type of study design, k = 0.63 to 0.94; (2) type of analysis, k = 0.39 to 0.89; (3) evidence linkage assignment, k = 0.74 to 0.96; and (4) literature inclusion for database, k = 0.75 to 0.88. Three-rater chance-corrected agreement values were: (1) study design, Sav = 0.80, Var (Sav) = 0.007; (2) type of analysis, Sav = 0.59, Var (Sav) = 0.032; (3) linkage assignment, Sav = 0.73 Var (Sav) = 0.010; (4) literature database inclusion, Sav = 0.83 Var (Sav) = 0.015. These values represent moderate levels of agreement.

The findings of the literature analyses were supplemented by the opinions of Task Force members after considering opinions derived from a variety of sources, including informal commentary and comments from postings of the draft document on the ASA web site. In addition, opinions obtained from consultant surveys, open forum commentary and other sources used in the original Guidelines were reviewed and considered.

B. Consensus-Based Evidence.

Consensus was obtained from multiple sources, including: (1) survey opinion from consultants who were selected based on their knowledge or expertise in acute pain management, (2) survey opinions solicited from active members of the ASA, (3) testimony from attendees of a publicly-held open forum at a national anesthesia meeting (original Guidelines only), (4) Internet commentary, and (5) Task Force opinion and interpretation. The survey rate of return was 62% (n = 53 of 85) for the consultants (Table 2), and 268 surveys were received from active ASA members (Table 3).

For the previous update of the Guidelines, an additional survey was sent to the expert consultants asking them to indicate which, if any, of the evidence linkages would change their
clinical practices if the Guidelines were instituted. The rate of return was 70.1% (n = 61 of 87).

The percent of responding consultants expecting *no change* associated with each linkage were as follows: (1) proactive planning = 82.0%, (2) education and training = 88.5%, (3) education/participation of patient and family = 80.3%, (4) monitoring/documentation = 77.0%, (5) availability of anesthesiologists = 90.2%, (6) institutional protocols = 86.9%, (7) use of PCA, epidural, or regional techniques = 90.2%, (8) use of multimodality techniques = 88.5%, (9) organizational characteristics = 90.2%, (10) pediatric techniques = 95.1%, (11) geriatric techniques = 91.8%, and (12) ambulatory surgery techniques = 85.2%.

Sixty-five percent of the respondents indicated that the Guidelines would have *no effect* on the amount of time spent on a typical case, and 24% indicated that there would be an increase of the amount of time spent on a typical case with the implementation of these Guidelines (mean time increase = 3.4 minutes). Eighty-nine percent indicated that new equipment, supplies or training would *not* be needed in order to implement the guidelines, and 92% indicated that implementation of the Guidelines would *not* require changes in practice that would affect costs.
Table 1. Meta-Analysis Summary

<table>
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<th>Evidence Linkages</th>
<th>N</th>
<th>Fisher Chi-Sq</th>
<th>P Value</th>
<th>Weighted Stouffer Zc</th>
<th>P Value</th>
<th>Effect Size</th>
<th>Odds Ratio</th>
<th>Confidence Interval</th>
<th>P Values</th>
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<td>Postoperative vs saline</td>
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‡‡ Random-effects odds-ratio
§§ Random-effects odds-ratio
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<tr>
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<th>Pain scores</th>
<th>Nausea/vomiting</th>
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<th>Motor weakness</th>
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<td><strong>Plexus and other blocks</strong></td>
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<td><em>Preincisional vs saline</em></td>
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<td><strong>Infiltration of incisions</strong></td>
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<td>0.58-2.80</td>
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**MULTIMODALITY TECHNIQUES**

Two or more vs single drug, same route

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<th>Comparison</th>
<th>Pain scores/relief</th>
<th>Pain scores</th>
<th>Nausea/vomiting</th>
<th>Pruritus</th>
</tr>
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<td><strong>Epidural morphine+local anesthetics vs morphine</strong></td>
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<td>0.001</td>
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<td>Nausea/vomiting</td>
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<td>2.02</td>
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<td>Pruritus</td>
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<tr>
<td><strong>Epidural fentanyl+local anesthetics vs fentanyl</strong></td>
<td>10</td>
<td>67.21</td>
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<td>3.23</td>
<td>1.57</td>
<td>1.57-6.65</td>
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<td><strong>Epidural fentanyl+bupivacaine vs bupivacaine</strong></td>
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<td>1.27</td>
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<td>0.58-2.80</td>
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<td>----------------</td>
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<td>Pain scores</td>
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<td>45.77</td>
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<td><strong>Pain scores</strong></td>
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</tr>
<tr>
<td><em>IV morphine+ketorolac vs IV morphine</em></td>
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<td>Nausea/vomiting</td>
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<td><strong>Analgesic use</strong></td>
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<td></td>
</tr>
<tr>
<td><em>IV morphine+ ketamine vs IV morphine</em></td>
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<td></td>
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<td>Analgesic use</td>
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<td>Nausea</td>
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<tr>
<td><strong>Two or more routes vs single route</strong></td>
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<tr>
<td><em>IV opioids combined with calcium channel blockers (gabapentin, pregabalin) vs IV opioids</em></td>
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<tr>
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<tr>
<td>Vomiting</td>
<td>5</td>
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### Table 2: Consultant Survey Responses

#### Percent Responding to Each Item

<table>
<thead>
<tr>
<th>I. Institutional Policies and Procedures for Providing Perioperative Pain Management:</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anesthesiologists offering perioperative analgesia services should provide, in collaboration with other health care professionals as appropriate, ongoing education and training of hospital personnel regarding the effective and safe use of the available treatment options within the institution</td>
<td>53</td>
<td>86.8*</td>
<td>11.3</td>
<td>1.9</td>
<td>0.0</td>
</tr>
<tr>
<td>2. Anesthesiologists and other health care providers should use standardized, validated instruments to facilitate the regular evaluation and documentation of pain intensity, the effects of pain therapy, and side effects caused by the therapy</td>
<td>53</td>
<td>67.9*</td>
<td>26.4</td>
<td>5.7</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Anesthesiologists responsible for perioperative analgesia should be available at all times to consult with ward nurses, surgeons, or other involved physicians, and should assist in evaluating patients who are experiencing problems with any aspect of perioperative pain relief</td>
<td>53</td>
<td>56.6*</td>
<td>26.4</td>
<td>17.0</td>
<td>0.0</td>
</tr>
<tr>
<td>4. Anesthesiologists should provide analgesia services within the framework of an Acute Pain Service, and participate in developing standardized institutional policies and procedures</td>
<td>53</td>
<td>73.6*</td>
<td>26.4</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>5. An integrated approach to perioperative pain management (e.g., ordering, administering, and transitioning therapies, transferring responsibility for pain therapy, outcomes assessment, continuous quality improvement) should be used to minimize analgesic gaps</td>
<td>53</td>
<td>73.6*</td>
<td>24.5</td>
<td>1.9</td>
<td>0.0</td>
</tr>
</tbody>
</table>

#### II. Preoperative Evaluation of the Patient:

| 6. A directed pain history, a directed physical examination, and a pain control plan should be included in the anesthetic preoperative evaluation | 52 | 57.7* | 36.5 | 3.8 | 1.9 | 0.0 |

*** N = number of consultants who responded to each item. An asterisk beside a percentage score indicates the median.
II. Preoperative Preparation of the Patient:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Patient preparation for perioperative pain management should include appropriate adjustments or continuation of medications to avert an abstinence syndrome, treatment of preexistent pain, or preoperative initiation of therapy for postoperative pain management</td>
<td>53</td>
<td>77.4*</td>
<td>18.9</td>
<td>3.8</td>
</tr>
<tr>
<td>8.</td>
<td>Anesthesiologists offering perioperative analgesia services should provide, in collaboration with others as appropriate, patient and family education</td>
<td>53</td>
<td>50.9*</td>
<td>35.8</td>
<td>7.5</td>
</tr>
<tr>
<td>9.</td>
<td>Perioperative patient education should include instruction in behavioral modalities for control of pain and anxiety</td>
<td>53</td>
<td>37.7</td>
<td>39.6*</td>
<td>13.2</td>
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IV. Perioperative Techniques for Pain Management:

<table>
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<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
<tbody>
<tr>
<td>10.</td>
<td>Anesthesiologists who manage perioperative pain should utilize therapeutic options such as epidural or intrathecal opioids, systemic opioid PCA, and regional techniques, after thoughtfully considering the risks and benefits for the individual patient</td>
<td>53</td>
<td>86.8*</td>
<td>13.2</td>
<td>0.0</td>
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<tr>
<td>11.</td>
<td>These modalities should be used in preference to intramuscular opioids ordered “as needed”</td>
<td>53</td>
<td>79.2*</td>
<td>11.3</td>
<td>3.8</td>
</tr>
<tr>
<td>12.</td>
<td>The therapy selected should reflect the individual anesthesiologist’s expertise, as well as the capacity for safe application of the modality in each practice setting</td>
<td>53</td>
<td>79.2*</td>
<td>17.0</td>
<td>0.0</td>
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<tr>
<td>13.</td>
<td>Special caution should be taken when continuous infusion modalities are used, as drug accumulation may contribute to adverse events</td>
<td>53</td>
<td>69.8*</td>
<td>26.4</td>
<td>1.9</td>
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</table>

V. Multimodal Techniques for Pain Management:

<table>
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<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
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<tr>
<td>14.</td>
<td>Whenever possible, anesthesiologists should employ multimodal pain management therapy</td>
<td>53</td>
<td>71.7*</td>
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</table>
### Percent Responding to Each Item

<table>
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<tr>
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<th>N</th>
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<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>15.</strong></td>
<td>The following drugs should be considered as part of a postoperative multimodal pain management regimen:</td>
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<td></td>
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<tr>
<td>COX-2 selective NSAIDs (COXIBs)</td>
<td>53</td>
<td>49.1*</td>
<td>34.0*</td>
<td>15.1</td>
<td>1.9</td>
<td>0.0</td>
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<tr>
<td>Nonselective NSAIDs</td>
<td>52</td>
<td>19.2</td>
<td>57.7*</td>
<td>23.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Acetaminophen</td>
<td>53</td>
<td>62.3*</td>
<td>32.1</td>
<td>5.7</td>
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<td>0.0</td>
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<tr>
<td>Calcium channel alpha-2-delta antagonists (e.g., gabapentin, pregabalin)</td>
<td>53</td>
<td>22.6</td>
<td>50.9*</td>
<td>26.4</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>16.</strong></td>
<td>Unless contraindicated, all patients should receive an around-the-clock regimen of NSAIDs, COXIBs, or acetaminophen</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>51</td>
<td>54.9*</td>
<td>23.5</td>
<td>7.8</td>
<td>9.8</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>17.</strong></td>
<td>Regional blockade with local anesthetics should be considered as part of a multimodal approach for pain management</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>52</td>
<td>73.1*</td>
<td>25.0</td>
<td>1.9</td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td><strong>18.</strong></td>
<td>Dosing regimens should be administered to optimize efficacy while minimizing the risk of adverse events</td>
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<tr>
<td></td>
<td>52</td>
<td>86.5*</td>
<td>13.5</td>
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<td>0.0</td>
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<tr>
<td><strong>19.</strong></td>
<td>The choice of medication, dose, route, and duration of therapy should be individualized</td>
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<td>52</td>
<td>73.1*</td>
<td>26.9</td>
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</tbody>
</table>

**VI. Patient Subpopulations:**

**Pediatric patients:**

20. Perioperative care for children undergoing painful procedures or surgery requires developmentally appropriate pain assessment and therapy

|  | 53  | 73.6* | 24.5 | 1.9 | 0.0 | 0.0 |

21. Analgesic therapy should depend upon age, weight, and comorbidity, and unless contraindicated should involve a multimodal approach

|  | 53  | 67.9* | 30.2 | 1.9 | 0.0 | 0.0 |

22. Behavioral techniques, especially important in addressing the emotional component of pain, should be applied whenever feasible

|  | 53  | 50.9* | 30.2 | 18.9 | 0.0 | 0.0 |

23. As many analgesic medications are synergistic with sedating agents, it is imperative that appropriate monitoring be employed during the procedure and recovery

|  | 53  | 83.0* | 17.0 | 0.0 | 0.0 | 0.0 |
Percent Responding to Each Item

**Geriatric patients:**

24. Pain assessment and therapy should be integrated into the perioperative care of geriatric patients

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>73.6*</td>
<td>26.4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

25. Pain assessment tools appropriate to a patient’s cognitive abilities should be employed

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>77.4*</td>
<td>22.6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
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</table>

26. Extensive and proactive evaluation and questioning should be conducted to overcome barriers that hinder communication regarding unrelieved pain

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<tr>
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<th>Disagree</th>
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</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>58.5*</td>
<td>35.8</td>
<td>5.7</td>
<td>0.0</td>
<td>0.0</td>
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27. Dose titration should be done to ensure adequate treatment while avoiding adverse effects such as somnolence in this vulnerable group, who may be taking other medications

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</thead>
<tbody>
<tr>
<td>53</td>
<td>77.4*</td>
<td>22.6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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</table>

**Other Subpopulations:**

28. Anesthesiologists should recognize that patients who are critically ill, cognitively impaired, or have communication difficulties may require additional interventions to ensure optimal perioperative pain management

<table>
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<tr>
<th></th>
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<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>73.6*</td>
<td>24.5</td>
<td>1.9</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

29. Anesthesiologists should consider a therapeutic trial of an analgesic in patients with elevated blood pressure and heart rate or agitated behavior, when causes other than pain have been excluded

<table>
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<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>50.9*</td>
<td>37.7</td>
<td>9.4</td>
<td>1.9</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Table 3: ASA Member Survey Responses †††

### Percent Responding to Each Item

<table>
<thead>
<tr>
<th>I. Institutional Policies and Procedures for Providing Perioperative Pain Management:</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anesthesiologists offering perioperative analgesia services should provide, in collaboration with other health care professionals as appropriate, ongoing education and training of hospital personnel regarding the effective and safe use of the available treatment options within the institution</td>
<td>N</td>
<td>268</td>
<td>53.0*</td>
<td>37.7</td>
<td>4.1</td>
</tr>
<tr>
<td>2. Anesthesiologists and other health care providers should use standardized, validated instruments to facilitate the regular evaluation and documentation of pain intensity, the effects of pain therapy, and side effects caused by the therapy</td>
<td>N</td>
<td>268</td>
<td>52.2*</td>
<td>35.5</td>
<td>7.5</td>
</tr>
<tr>
<td>3. Anesthesiologists responsible for perioperative analgesia should be available at all times to consult with ward nurses, surgeons, or other involved physicians, and should assist in evaluating patients who are experiencing problems with any aspect of perioperative pain relief</td>
<td>N</td>
<td>267</td>
<td>38.9</td>
<td>36.0*</td>
<td>12.4</td>
</tr>
<tr>
<td>4. Anesthesiologists should provide analgesia services within the framework of an Acute Pain Service, and participate in developing standardized institutional policies and procedures</td>
<td>N</td>
<td>268</td>
<td>39.9</td>
<td>39.2*</td>
<td>14.9</td>
</tr>
<tr>
<td>5. An integrated approach to perioperative pain management (e.g., ordering, administering, and transitioning therapies, transferring responsibility for pain therapy, outcomes assessment, continuous quality improvement) should be used to minimize analgesic gaps</td>
<td>N</td>
<td>269</td>
<td>46.5</td>
<td>44.6*</td>
<td>7.4</td>
</tr>
</tbody>
</table>

### II. Preoperative Evaluation of the Patient:

6. A directed pain history, a directed physical examination, and a pain control plan should be included in the anesthetic preoperative evaluation | N | 267 | 30.3 | 39.7* | 18.4 | 9.4 | 2.2 |

††† N = number of ASA members who responded to each item. An asterisk beside a percentage score indicates the median.
II. Preoperative Preparation of the Patient:

7. Patient preparation for perioperative pain management should include appropriate adjustments or continuation of medications to avert an abstinence syndrome, treatment of preexistent pain, or preoperative initiation of therapy for postoperative pain management

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>266</td>
<td>51.5%</td>
<td>41.7%</td>
<td>5.7%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

8. Anesthesiologists offering perioperative analgesia services should provide, in collaboration with others as appropriate, patient and family education

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>268</td>
<td>28.7%</td>
<td>56.7%</td>
<td>10.1%</td>
<td>3.7%</td>
</tr>
</tbody>
</table>

9. Perioperative patient education should include instruction in behavioral modalities for control of pain and anxiety

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>269</td>
<td>22.7%</td>
<td>42.8%</td>
<td>27.1%</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

IV. Perioperative Techniques for Pain Management:

10. Anesthesiologists who manage perioperative pain should utilize therapeutic options such as epidural or intrathecal opioids, systemic opioid PCA, and regional techniques, after thoughtfully considering the risks and benefits for the individual patient

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>269</td>
<td>65.4%</td>
<td>31.2%</td>
<td>1.9%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

11. These modalities should be used in preference to intramuscular opioids ordered “as needed”

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>269</td>
<td>65.8%</td>
<td>24.9%</td>
<td>7.5%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

12. The therapy selected should reflect the individual anesthesiologist’s expertise, as well as the capacity for safe application of the modality in each practice setting

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>269</td>
<td>70.6%</td>
<td>26.8%</td>
<td>1.9%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

13. Special caution should be taken when continuous infusion modalities are used, as drug accumulation may contribute to adverse events

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>268</td>
<td>67.6%</td>
<td>30.2%</td>
<td>1.1%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

V. Multimodal Techniques for Pain Management:

14. Whenever possible, anesthesiologists should employ multimodal pain management therapy

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>267</td>
<td>56.2%</td>
<td>28.1%</td>
<td>12.4%</td>
<td>2.6%</td>
</tr>
</tbody>
</table>
Percent Responding to Each Item

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. The following drugs should be considered as part of a postoperative multimodal pain management regimen:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COX-2 selective NSAIDs (COXIBs)</td>
<td>268</td>
<td>35.8</td>
<td>47.4*</td>
<td>14.2</td>
<td>1.9</td>
<td>0.7</td>
</tr>
<tr>
<td>Nonselective NSAIDs</td>
<td>267</td>
<td>26.6</td>
<td>57.3*</td>
<td>12.7</td>
<td>2.6</td>
<td>0.8</td>
</tr>
<tr>
<td>Acetaminophen</td>
<td>267</td>
<td>41.9</td>
<td>44.2*</td>
<td>12.4</td>
<td>1.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Calcium channel alpha-2-delta antagonists (e.g., gabapentin, pregabalin)</td>
<td>265</td>
<td>15.1</td>
<td>38.5*</td>
<td>38.5</td>
<td>6.8</td>
<td>1.1</td>
</tr>
<tr>
<td>16. Unless contraindicated, all patients should receive an around-the-clock regimen of NSAIDs, COXIBs, or acetaminophen</td>
<td>264</td>
<td>24.2</td>
<td>34.1*</td>
<td>25.0</td>
<td>14.4</td>
<td>2.3</td>
</tr>
<tr>
<td>17. Regional blockade with local anesthetics should be considered as part of a multimodal approach for pain management</td>
<td>264</td>
<td>58.3*</td>
<td>37.1</td>
<td>2.7</td>
<td>1.1</td>
<td>0.8</td>
</tr>
<tr>
<td>18. Dosing regimens should be administered to optimize efficacy while minimizing the risk of adverse events</td>
<td>264</td>
<td>71.2*</td>
<td>27.3</td>
<td>1.1</td>
<td>0.4</td>
<td>0.0</td>
</tr>
<tr>
<td>19. The choice of medication, dose, route, and duration of therapy should be individualized</td>
<td>266</td>
<td>70.7*</td>
<td>27.1</td>
<td>1.1</td>
<td>1.1</td>
<td>0.0</td>
</tr>
</tbody>
</table>

VI. Patient Subpopulations:

Pediatric patients:

20. Perioperative care for children undergoing painful procedures or surgery requires developmentally appropriate pain assessment and therapy | 265 | 63.4*          | 35.1  | 1.5       | 0.0      | 0.0               |

21. Analgesic therapy should depend upon age, weight, and comorbidity, and unless contraindicated should involve a multimodal approach | 268 | 58.6*          | 34.7  | 4.5       | 2.2      | 0.0               |

22. Behavioral techniques, especially important in addressing the emotional component of pain, should be applied whenever feasible | 266 | 34.2           | 42.5* | 21.4      | 1.5      | 0.4               |

23. As many analgesic medications are synergistic with sedating agents, it is imperative that appropriate monitoring be employed during the procedure and recovery | 268 | 69.4*          | 30.2  | 0.4       | 0.0      | 0.0               |
<table>
<thead>
<tr>
<th>Geriatric patients:</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>24. Pain assessment and therapy should be integrated into the perioperative care of geriatric patients</td>
<td>268</td>
<td>60.1*</td>
<td>37.7</td>
<td>1.8</td>
<td>0.4</td>
<td>0.0</td>
</tr>
<tr>
<td>25. Pain assessment tools appropriate to a patient’s cognitive abilities should be employed</td>
<td>268</td>
<td>58.6*</td>
<td>39.9</td>
<td>1.1</td>
<td>0.4</td>
<td>0.0</td>
</tr>
<tr>
<td>26. Extensive and proactive evaluation and questioning should be conducted to overcome barriers that hinder communication regarding unrelieved pain</td>
<td>265</td>
<td>35.9</td>
<td>41.1*</td>
<td>20.0</td>
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<tr>
<td>27. Dose titration should be done to ensure adequate treatment while avoiding adverse effects such as somnolence in this vulnerable group, who may be taking other medications</td>
<td>269</td>
<td>59.5*</td>
<td>39.7</td>
<td>0.4</td>
<td>0.4</td>
<td>0.0</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Subpopulations:</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Equivocal</th>
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<th>Strongly Disagree</th>
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<td>28. Anesthesiologists should recognize that patients who are critically ill, cognitively impaired, or have communication difficulties may require additional interventions to ensure optimal perioperative pain management</td>
<td>268</td>
<td>53.0*</td>
<td>43.3</td>
<td>2.6</td>
<td>1.1</td>
<td>0.0</td>
</tr>
<tr>
<td>29. Anesthesiologists should consider a therapeutic trial of an analgesic in patients with elevated blood pressure and heart rate or agitated behavior, when causes other than pain have been excluded</td>
<td>267</td>
<td>32.6</td>
<td>56.5*</td>
<td>9.4</td>
<td>1.1</td>
<td>0.4</td>
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