



Topic Brief: Disparities in Anesthesia Care

Date: 6/11/2021

Nomination Number: 0956

Purpose: This document summarizes information addressing a nomination submitted on June 11, 2021, through the Effective Health Care Website. This information was used to inform the Evidence-based Practice Center (EPC) Program decisions about whether to produce an evidence report on the topic, and if so, what type of evidence report would be most suitable.

Issue:

Despite advances in medicine and technology, disparities in healthcare persist and disproportionately impact racial and ethnic minorities, disabled, and socioeconomically disadvantaged communities in the U.S. Compared to the general population, these subgroups face greater obstacles accessing health services for both chronic and acute medical conditions and often experience worse health outcomes. Numerous studies reported inequities in delivery of anesthesia care based on patients' race/ethnicity, sex, sexual orientation, disability status, English language proficiency and health insurance status. However, there is limited evidence regarding strategies to address disparities in anesthesia care and their effectiveness. This nomination seeks to examine the existing interventions to reduce disparities in preoperative, intraoperative, and postoperative anesthesia care among adults undergoing obstetric, general, and orthopedic surgery.

Program Decision

The EPC Program will not develop a new systematic review because we did not find enough primary studies addressing the topic of this nomination.

Key Findings

We found no published or in-progress systematic reviews and only three primary studies pertaining to the key questions of this nomination. Two RCTs^{1,2} partially addressed Key Question (KQ) 1 of the nomination, pertaining to the effectiveness of quality improvement interventions to reduce disparities in preoperative anesthesia care. We identified only one prospective cohort study³ that partially addressed KQ2 regarding the effectiveness of quality improvement strategies to reduce disparities in postoperative anesthesia care.

Background

The American Public Health Association (APHA) officially recognized racism as a public health issue in 2019⁴. Following the COVID-19 pandemic, the APHA declared racism a public health crisis and called for strategic action to tackle healthcare disparities⁵. Numerous studies that examined inequities in healthcare delivery and health outcomes based on social determinants of health (i.e. demographic, socioeconomic factors, language and health literacy) found that

healthcare disparities permeate not only primary, preventive and chronic illness care, but also acute illness services, including pre-and postoperative anesthesia care^{6, 7}.

Research examining disparities in anesthesia care identified both individual and systems level factors. Individual level factors stem from patients' racial/ethnic, demographic, and socioeconomic characteristics⁸ while systems factors arise from inadequate healthcare infrastructure and service delivery in socioeconomically disadvantaged residential areas. Studies that examined disparities in obstetric anesthesia care revealed that racial and ethnic minority women receive lower quality obstetric care and have higher rates of pregnancy related morbidity and mortality compared to White women. African-American, Hispanic, and Asian women undergoing cesarean delivery are more likely to receive general rather than epidural anesthesia compared to White women⁹. African-American and Hispanic women are also more likely to receive suboptimal postpartum pain control and to report higher pain scores following delivery both during inpatient and at discharge compared to White women¹⁰.

Disparities in anesthesia care are not limited to obstetric services. African American patients are also more likely to receive inadequate postoperative analgesia for other acute conditions, such as extremity fractures and appendicitis compared to Whites¹¹. Aside from race/ethnicity, lower socioeconomic status and insurance status and type were also found to be associated with inequalities in anesthesia care¹².

Nomination Summary

The American Society of Anesthesiologists (ASA) has nominated this topic for a systematic review to assess the effectiveness of existing strategies to reduce disparities in adults pre-, intra- and postoperative anesthesia care. After discussions with the nominator, we narrowed the topic scope to the three areas that were most likely to yield relevant literature and were considered most likely to impact clinical practice – disparities in anesthesia care among adults undergoing obstetric, general, and orthopedic surgeries. The nominator intends to utilize findings from this potential evidence review to educate ASA clinician members about available interventions to reduce disparities in anesthesia care. The nominator also plans to collaborate with other professional societies, such as the Anesthesia Quality Institute and the Anesthesia Patient Safety Foundation to develop evidence-based performance standards to identify and mitigate disparities in anesthesiology providers' practice.

Scope

Key Questions:

1. What is the effectiveness of quality improvement strategies to reduce disparities in anesthesia care (with focus on the areas below) among patients with different social risk factors (listed below) during the preoperative period?
 - a) obstetric surgery/procedures
 - b) general surgery
 - c) orthopedic surgery
2. What is the effectiveness of quality improvement strategies to reduce disparities in anesthesia care (with focus on the areas below) among patients with different social risk factors during the intra-operative and early postoperative periods?
 - a) obstetric surgery/procedures
 - b) general surgery
 - c) orthopedic surgery

Table 1. Questions and PICOTS (population, intervention, comparator, outcome, timing, and setting)

Key questions	<p>1. What is the effectiveness of quality improvement strategies to reduce disparities in anesthesia care (with focus on the areas below) among patients with different social risk factors (listed below) during the preoperative period?</p> <ul style="list-style-type: none"> (a) obstetric surgery/procedures (b) general surgery (c) orthopedic surgery 	<p>2. What is the effectiveness of quality improvement strategies to reduce disparities in anesthesia care (with focus on the areas below) among patients with different social risk factors during the intra-operative and early postoperative periods?</p> <ul style="list-style-type: none"> (a) obstetric surgery/procedures (b) general surgery (c) orthopedic surgery
Population	<p>Adults receiving preoperative anesthesia care, stratified by the following social risk factors:</p> <ul style="list-style-type: none"> • sex • sexual orientation • disability status • socioeconomic status • language barrier • health literacy 	<p>Adults receiving intra-operative and early postoperative anesthesia care, stratified by:</p> <ul style="list-style-type: none"> • sex • sexual orientation • disability status • socioeconomic status • language barrier • health literacy
Interventions	<p>Quality improvement interventions aimed at reducing disparities in anesthesia care, including but not limited to:</p> <ul style="list-style-type: none"> (a) preoperative anesthesiology evaluation to identify health risk factors for surgery; (b) preoperative health optimization (i.e. smoking cessation, weight reduction, cardiac rehabilitation, medical management optimization and other similar interventions); (c) coordination of services (engaging case managers, social workers, or patient navigators to coordinate pre- and post-operative care); (d) physician education regarding health disparities by social risk factors; (e) patient education; (f) promotion of patient self-management; (g) patient reminder systems. 	<p>Quality improvement interventions aimed at reducing disparities in intraoperative and early postoperative anesthesia care, including but not limited to:</p> <ul style="list-style-type: none"> (a) patient education re anesthesia options (i.e. general vs regional vs other forms of anesthesia) available for the procedure; (b) implementation of nausea/vomiting prophylaxis; (c) interventions to reduce postsurgical complications (post-op hemorrhage etc.); (d) coordination of services (engaging case managers, social workers, or patient navigators to coordinate pre- and post-operative care); (e) physician education regarding health disparities by social risk factors; (f) patient education; (g) promotion of patient self-management; (h) patient reminder systems
Comparator	Standard preoperative anesthesia care	Standard intra-operative and early postoperative anesthesia care
Outcomes	<ul style="list-style-type: none"> • Hospital length of stay • Postoperative mortality (30, 60, and 90 day) • Postoperative morbidity • Frequency of discharge to nursing homes or postoperative rehabilitation centers • Frequency of unplanned ICU admissions • ICU length of stay • Patient experience and satisfaction • Patient quality of life 	<ul style="list-style-type: none"> • Hospital length of stay • Postoperative mortality (30, 60, and 90 day) • Postoperative morbidity • Frequency of discharge to nursing homes or postoperative rehabilitation centers • Frequency of unplanned ICU admissions • ICU length of stay • Patient experience and satisfaction • Patient quality of life

	<ul style="list-style-type: none"> • Postoperative utilization of health services • Patient utilization of preventive services 	<ul style="list-style-type: none"> • Postoperative utilization of health services • Patient utilization of preventive service
Timing	Weeks to months prior to surgery	Days to months following surgery
Setting	Outpatient (anesthesiology pre-op clinics)	Outpatient (for ambulatory surgeries) inpatient (for hospital-based surgeries)

Abbreviations: Post-op = Postoperative; ICU = Intensive Care Unit

Assessment Methods

See Appendix A.

Summary of Literature Findings

Overall, we identified no systematic reviews and very few primary studies pertaining to the key questions of this nomination.

For KQ1 we found two RCTs^{1,2} addressing the effectiveness of a patient centered educational intervention targeting health literacy and language related barriers in obstetric anesthesia care. One RCT¹ conducted in the U.S. examined whether combined patient education and counseling intervention explaining the benefits and harms of using epidural anesthesia during labor improved utilization of epidural anesthesia among minority Medicaid beneficiaries presenting for cesarean delivery. Another RCT² from South Africa assessed the effectiveness of a similar educational intervention on reducing patient anxiety, and improving physician-patient communication and care satisfaction ratings among indigenous women presenting for elective cesarean delivery.

For KQ2, we found only one prospective cohort study³ that evaluated the effectiveness of a quality improvement intervention involving EHR based monitoring and personalized feedback to anesthesiology providers regarding their adherence to evidence-based practices for prescribing postoperative nausea and vomiting prophylaxis.

We did not find any reviews or primary studies examining interventions to reduce disparities in anesthesia care based on patients' race/ethnicity, sex/gender, disability, or socioeconomic status.

Table 2. Literature identified for each Key Question

Question	Systematic reviews (8/2019 – 8/2021)	Primary studies (8/2017 – 8/2021)
KQ1. Interventions to reduce disparities in preoperative anesthesia care	Total: 0	Total: 2 ^{1,2} <ul style="list-style-type: none"> • RCT – 2^{1,2}
KQ2. Interventions to reduce disparities in intra- and postoperative anesthesia care	Total: 0	Total: 1 <ul style="list-style-type: none"> • Prospective cohort – 1³

Abbreviations: RCT=Randomized Controlled Trial.

See Appendix B for detailed assessments of all EPC selection criteria.

Summary of Selection Criteria Assessment

This nomination met the selection criteria for appropriateness, importance, impact, and absence of duplication. A systematic review evaluating existing interventions to minimize disparities in anesthesia care based on social determinants of health would be appropriate because it would help address these disparities. Such also be review would be important because it would help elucidate evidence-based strategies to reduce disparities in anesthesia care and positively impact health outcomes in vulnerable populations. This review would not be redundant since we did not find any published or in-progress reviews on the subject.

However, due to a very limited volume of identified primary literature (there were only two RCTs that partially addressed KQ1 and only one prospective cohort that was relevant to KQ2), it would not be feasible to develop a systematic review on this topic at this time.

Related Resources

We found three national registry based retrospective analyses¹³⁻¹⁵ hat assessed disparities in anesthesia care based on race/ethnicity and sex and a qualitative study¹⁶ examining anesthesia disparities that may be relevant to KQ1. One U.S.-based retrospective analysis examined the association between race/ethnicity and receipt of regional anesthesia among patients undergoing mastectomy surgery¹⁴. Another U.S.-based retrospective registry study assessed the association between the race/ethnicity of women hospitalized for cesarean delivery and their receipt of regional versus general intraoperative anesthesia¹³. A large Canadian population-based retrospective study of patients undergoing orthopedic surgery evaluated differences in receipt of evidence-based preoperative anesthesia evaluation between male and female patients¹⁵. Finally, we also found a U.S.-based qualitative survey that examined educational, cultural, and other factors responsible for lower rates of utilization of epidural anesthesia among African-American women presenting for labor and delivery¹⁶.

We found only one additional study¹⁷ that may be relevant to KQ2. The study was a retrospective analysis of the U.S. National Anesthesia Clinical Outcomes Registry (NACOR) that examined the association between patients' insurance status (which the study used as a proxy of socioeconomic status) and receipt of evidence-based postoperative antiemetic prophylaxis.

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Appendix A: Methods

We assessed the nomination for priority for a systematic review or other AHRQ Effective Health Care report with a hierarchical process using established selection criteria. Assessment of each criteria determined the need to evaluate the next one. See Appendix B for a detailed description of the criteria.

Appropriateness and Importance

We assessed the nomination for appropriateness and importance.

Desirability of New Review/Absence of Duplication

We searched for high-quality, completed or in-process evidence reviews published in the last three years on August 12, 2021 on the questions of the nomination from these sources:

- AHRQ: Evidence reports and technology assessments
 - AHRQ Evidence Reports <https://www.ahrq.gov/research/findings/evidence-based-reports/index.html>
 - EHC Program <https://effectivehealthcare.ahrq.gov/>
 - AHRQ Technology Assessment Program <https://www.ahrq.gov/research/findings/ta/index.html>
- US Department of Veterans Affairs Products publications
 - Evidence Synthesis Program <https://www.hsrd.research.va.gov/publications/esp/>
 - VA/Department of Defense Evidence-Based Clinical Practice Guideline Program <https://www.healthquality.va.gov/>
- Cochrane Systematic Reviews <https://www.cochranelibrary.com/>
- University of York Centre for Reviews and Dissemination database <https://www.crd.york.ac.uk/CRDWeb/>
- PROSPERO Database (international prospective register of systematic reviews and protocols) <http://www.crd.york.ac.uk/prospero/>
- PubMed <https://www.ncbi.nlm.nih.gov/pubmed/>
- PCORI <https://www.pcori.org/>

Impact of a New Evidence Review

The impact of a new evidence review was qualitatively assessed by analyzing the current standard of care, the existence of potential knowledge gaps, and practice variation. We considered whether it was possible for this review to influence the current state of practice through various dissemination pathways (practice recommendation, clinical guidelines, etc.).

Feasibility of New Evidence Review

We conducted a literature search in PubMed, Cochrane Controlled Trials Register (CENTRAL) and ClinicalTrials.gov for primary studies published within five years from August 12, 2021. We reviewed all identified titles and abstracts for inclusion and classified identified studies by question and study design to estimate the size and scope of a potential evidence review.

Search strategy

Considering our limited literature findings, below is a synopsis of the approach utilized to search for relevant literature.

For our initial search, we searched for published and in progress reviews using combined search terms of "Anesthesiology", "Equity" and "Interventions" and found no relevant results. We then

modified our search strategy to look for publications addressing equity and disparities related outcomes in surgical healthcare in general without the use of the term "Interventions" but again identified no relevant findings. We then further expanded our search strategy to look for publications broadly related to "Anesthesiology" without specifying the terms "Disparities" and "Interventions". This time we found only one review pertaining to a lack of healthcare workforce diversity in anesthesiology.

For our feasibility search, we searched for primary studies published within the past five years evaluating quality improvement interventions to reduce disparities in anesthesia care based on race/ethnicity, sex/gender, disability, educational and socioeconomic status, and English language proficiency. Our search yielded a total of 38 titles and abstracts.

MEDLINE (PubMed) searched on August 12, 2021
<p>Date Searched: August 11th, 2021 ("anesthesiology"[MeSH Terms] OR "anesthesia"[MeSH Terms] OR "anesthetists"[MeSH Terms] OR "anesthesiologists"[MeSH Terms] OR "anesthes*" [Title/Abstract]) AND ("healthcare disparities"[MeSH Terms] OR "health equity"[MeSH Terms] OR "health status disparities"[MeSH Terms] OR "equity"[Title/Abstract] OR "disparity"[Title/Abstract] OR "disparities"[Title/Abstract]) AND "adult"[MeSH Terms] AND "english"[Language] AND 2018/08/11:3000/12/31[Date - Entry] N=23</p>
ClinicalTrials.gov searched on August 12, 2021
<p>N=15 ClinicalTrials.gov Link</p>

Appendix B. Selection Criteria Assessment

Selection Criteria	Assessment
1. Appropriateness	
1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the U.S.?	Yes.
1b. Is the nomination a request for an evidence report?	Yes.
1c. Is the focus on effectiveness or comparative effectiveness?	Yes.
1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic?	Yes.
2. Importance	
2a. Represents a significant disease burden; large proportion of the population	Yes. Low income and minority populations are less likely to have access to primary care, preventive care, and routine chronic care compared to the U.S. general population. As a result, chronic conditions may go undiagnosed and remain untreated until urgent care is required. As such, anesthesiology providers conducting preoperative assessments play an important role in addressing chronic conditions and connecting patients to appropriate medical and other resources ¹⁸ .
2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large proportion of the US population or for a vulnerable population	Yes. Disparities in the U.S. healthcare have been recognized for a long time. The 2020 COVID-19 pandemic only magnified healthcare inequities, faced by ethnic minorities, and disabled and socioeconomically disadvantaged populations ¹⁹ .
2c. Incorporates issues around both clinical benefits and potential clinical harms	Yes. Disparities in healthcare access leads to inequitable health outcomes and ultimately higher rates of preventable illness in the morning racial and ethnic minorities, disabled, low income communities and those with low health literacy and English language proficiency ²⁰ .
2d. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers	Economic analysis estimated healthcare disparities cost the U.S. economy approximately \$93 billion in excess healthcare costs and \$42 billion in lost productivity every year ²¹ .
3. Desirability of a New Evidence Review/Absence of Duplication	
3. A recent high-quality systematic review or other evidence review is not available on this topic	No. We did not identify any recent published or in-progress systematic reviews on this topic.
4. Impact of a New Evidence Review	
4a. Is the standard of care unclear (guidelines not available or guidelines inconsistent, indicating an information gap that may be addressed by a new evidence review)?	Yes, Currently, there are no evidence-based recommendations on reducing disparities in anesthesia care.
4b. Is there practice variation (guideline inconsistent with current practice, indicating a potential implementation gap and not best addressed by a new evidence review)?	Yes. The fact that disparities in obstetric, general surgery, and orthopedic surgery related anesthesia care persist demonstrates that there is a considerable variation in delivery of anesthesia care.
5. Primary Research	

<p>5. Effectively utilizes existing research and knowledge by considering:</p> <ul style="list-style-type: none"> - Adequacy (type and volume) of research for conducting a systematic review - Newly available evidence (particularly for updates or new technologies) 	<p>We identified only 2 RCTs relevant to KQ1 and 1 retrospective cohort study relevant to KQ2.</p>
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Abbreviations: AHRQ=Agency for Healthcare Research and Quality; U.S.= United States; COVID-19= Coronavirus Disease of 2019