Certified Registered Nurse Anesthetists (CRNAs) deliver anesthesia to more than 34 million patients per year in the United States in both inpatient and outpatient settings. Yet CRNA working conditions and workforce outcomes have not been well investigated in the literature. For a deeper understanding of both issues, a review of the literature was conducted. Following specific inclusion criteria, peer-reviewed research articles published from 2001 to 2015 were included. Data were abstracted from 13 studies and were synthesized.

Four themes emerged: communication and collaboration; professional identity and autonomy; work relations issues experienced by CRNAs, who practice in a variety of healthcare settings; and CRNA outcomes. Regarding the latter, job dissatisfaction, occupational stress, incivility, burnout, workplace aggression, and intent to leave were prevalent CRNA outcomes. Future rigorous research should focus on CRNA working conditions that could be changed to diminish negative CRNA outcomes. Positive CRNA workforce outcomes in turn could have financial, access-to-care, and quality-of-care implications for organizations where CRNAs practice. Policy makers, organizations, CRNAs, and the patients and families CRNAs serve would benefit from such research.

Keywords: Burnout, CRNA working conditions, conflict, incivility, workplace aggression.

The demand for anesthesia services is increasing as individuals live longer; experience more acute and chronic conditions; and require diagnostic, procedural, and surgical interventions. During a 10-year period from 1996 to 2006, the national volume of ambulatory surgical cases increased by 300%, with nearly 15 million procedures performed in ambulatory surgical centers in 2006. In addition to this increased demand for services, the Affordable Care Act’s addition of 8 million newly insured individuals will further strain the healthcare system’s ability to provide anesthesia care because many of these previously uninsured individuals will seek surgical procedures. Currently, 42,000 nurse anesthetists across the United States participate in 65% of all anesthetic cases per year. Despite the Certified Registered Nurse Anesthetist (CRNA) workforce being projected to increase by 25% from 2012 to 2022, there is concern that the supply of CRNAs may still be inadequate, especially in ambulatory surgical centers, potentially thwarting the ability of this growing workforce to deliver high-quality services to patients.

Although increasing the number of CRNAs will help meet care demands, it is only one strategy to address the challenges. Another strategy is retaining CRNAs in their current positions and promoting their practices through creating productive working conditions. The attributes of work context in healthcare organizations are referred to in the literature as organizational climate, practice environment, or work environment, among other terms. Organizational climate is one of the most commonly used terms to describe the work setting of employees and has been described as shared perceptions of important aspects of the work environment that affect individuals’ behavior within organizations. A robust literature exists on the work context of registered nurses (RNs), in which organizational climate has been described to include aspects of quality, safety, collaboration, teamwork, and autonomy. A growing body of literature exists describing the organizational climate of nurse practitioners (NPs) to include professional visibility, NP-physician relations, NP-administration relations, and independent practice and support. However, little work has been done to explore the organizational climate of CRNAs, with most work focusing on general working conditions of CRNAs. Therefore, the aim of this literature review was to investigate the existing evidence regarding working conditions of CRNAs and their relationships with CRNA outcomes.

Methods
A comprehensive search of the literature was conducted using the following search engines: Ovid/MEDLINE, PubMed, Scopus (Elsevier), and Cumulative Index to Nursing and Allied Health Literature (EBSCO). Google Scholar was used to search for additional articles. Using the RN and NP literature regarding organizational climate
as a guide for our search strategy, we conducted the search using these keywords in various combinations: nurse anesthetists, job satisfaction, physician-nurse relations, interpersonal relations, organizational culture, professional autonomy, practice environment, professional practice, care environment, work environment, and stress. The full search strategy for all databases is available on request.

Following the Preferred Reporting Items for Systematic and Meta-Analyses guidelines, 14 studies were eligible for inclusion if they were conducted in the United States, published in English from January 2001 through May 2015, and were original research. Years of inclusion were selected based on the 2001 Code of Federal Regulations for the Centers for Medicare and Medicaid Services’ Hospital Conditions of Participation: Anesthesia Services, 15 which stated that no evidence existed that should require a federal mandate on CRNA supervision. Subsequent promulgation of state regulations regarding supervision of CRNAs resulted in state-by-state variability of physician supervision, which may have affected the working conditions of CRNAs beyond 2001. Exclusion criteria were publications that were nonresearch, opinions, or not relevant, such as focused on student registered nurse anesthetists (SRNAs) or focused on patient outcomes. Reference lists of included articles were scanned for additional titles.

**Results**

A total of 1,352 studies were retrieved. Initially, the titles and abstracts of the articles were screened, and after application of our inclusion and exclusion criteria, 113 articles were retained for further evaluation. Removal of duplicates left 19 articles for which full abstracts were read. Four articles were excluded—1 was nonresearch, and 3 were not relevant because 1 study focused on students, 1 focused on patient outcomes, and the third described anesthesia support personnel from the perspective of the CRNA—leaving 15 full-text articles for further review. Subsequently, 2 additional articles were excluded because they were not relevant: 1 described CRNA involvement in emergency airway management and trauma stabilization, and the other measured relative deprivation in active-duty CRNAs. Thus, a total of 13 studies were selected for in-depth review and ultimate inclusion (Figure).

• **Description of Studies.** Eight studies included in this review were quantitative studies of cross-sectional design with data collection via surveys. 16-23 Three studies used mixed methods, 24,26 whereas 2 were qualitative studies using in-person interviews. 27,28 Data regarding the characteristics of each study were abstracted and are tabulated in the Table.

Reviewed quantitative and mixed-methods studies used a variety of sampling strategies. In 2 of them, a national sample of participants was recruited from the CRNA membership roster of the American Association of Nurse Anesthetists (AANA). One study invited participation of all AANA members, 21 and the other used a random sample of AANA members. 25 Two studies used a sample from multiple states. Of these, 1 study invited participation of all AANA members from 6 New England states, 22 and the other invited participation of all operating room (OR) caregivers in a health system encompassing 16 states. 19 Six studies used AANA members from single states. Of these, 2 invited participation of all AANA members in that state, 20,26 one used a random sample of AANA members, 18 and 3 used a convenience sample of AANA members. 17,23,24 Response rates of individual studies ranged from just under 27% to 77%, 19 with sample sizes ranging from 145 to 7,537. 21 All studies had clearly defined foci, aims, and outcomes. Most studies incorporated a sample that was representative of its target population, used appropriate statistical methods, considered important outcomes, and confirmed that results could be applied to the local situation. Less than half of the studies stated that all survey questions had been validated, 19,20,23,26 and only 2 clearly addressed bias and confounding. 23,26

• **Themes From Reviewed Studies.** Four themes emerged from reviewed studies: communication and collaboration, professional identity and autonomy, work relations of CRNAs, and CRNA outcomes. Each theme is discussed here.

• **Collaboration and Communication.** Synthesized results showed that effective communication between
anesthesiologists and CRNAs was important for professional exchange of ideas and effective collaboration. In the perioperative setting, CRNAs have described themselves as collaborators who promote patient safety. Makary et al., in 2006, studied collaboration and communication of perioperative clinicians; results showed that the quality of collaboration and communication was rated higher among clinician groups than between clinician groups. Specifically, anesthesiologists rated the quality of their collaboration and communication with each other at 96%, whereas surgeons rated it at 84%, CRNAs rated it at 75%, and OR nurses rated it at 63%. Similar findings were observed with CRNAs rating the quality of their collaboration and communication with each other at 93%, whereas anesthesiologists rated it at 92%, surgeons rated it at 87%, and OR nurses rated it at 68%. In 2009 Jones and Fitzpatrick studied collaboration between anesthesia provider groups, and results showed that CRNA attitudes toward collaboration were significantly more positive than those of anesthesiologists. Furthermore, qualitative findings suggested that collaboration, teamwork, and mutual respect between CRNAs and anesthesiologists were important to providing safe care.

In addition to variable perceptions of collaboration between providers, studies also demonstrated variability in the amount of collaboration reported by CRNAs and anesthesiologists. One study conducted in a state that did not require physician supervision of CRNAs reported that 36% of CRNAs never collaborated with anesthesiologists and 20% of CRNAs collaborated with an anesthesiologist on every patient. Although anesthesiologist supervision of CRNAs has not been shown to improve patient outcomes, it seemed to affect CRNA outcomes. For example, CRNA attitudes on collaboration decreased as the percentage of anesthesiologists in the workplace increased. In cases in which an anesthesiologist supervises anesthesia residents or fellows in training, anesthesiologist assistants, or CRNAs, the American Society of Anesthesiologists defines this arrangement as the anesthesia care team (ACT). When the percentage of ACT practice exceeded 50%, CRNA attitudes on collaboration decreased, and role conflict increased and was associated with CRNA stress and job dissatisfaction. In general, 93% of clinically practicing CRNAs were satisfied or extremely satisfied with their career choice, but only 73% were satisfied or extremely satisfied with their jobs. What is unclear is: what are the etiologic bases for job dissatisfaction among CRNAs, and are they related to professional identity and autonomy or other complex work relations?

- **Professional Identity and Autonomy.** Professional identity included overlap in the professional roles of anesthesiologists and CRNAs as well as CRNAs believing that their professional autonomy was compromised because of it. Conflict in the work context of CRNAs and anesthesiologists may stem from the overlap in clinical responsibilities between these providers. When conflict incorporates a threat of identity, reinforcement of ongoing beliefs, and perpetuation of conflict, it has been described as intractable. In 2003 Jameson also described the conflict between anesthesiologists and CRNAs as intractable as well as encompassing a continuum of feelings among CRNAs and between CRNAs and anesthesiologists. Furthermore, this study's results showed that CRNAs are well trained, competent, and autonomous, and they expressed the desire for respect in their independent clinical decision making. However, because of overlap in their professional roles, both CRNAs and anesthesiologists felt a threat to their professional identities. In this study, positive assertions regarding anesthesia providers were evident within provider groups, but between provider groups, ambivalence was reported, and it may have been perpetuated from the respective national membership organizations. This created conflict between providers; however, effective communication had the ability to de-escalate conflict as it occurred. In another study, when conflict arose, only 15% of CRNAs resolved conflict through collaboration with anesthesiologists, whereas nearly 38% of CRNAs resolved conflict through compromise and 23% resolved it through avoidance.

Autonomy among advanced practice RNs has been described to involve self-determined, controlled actions not requiring authorization by another provider, and it has been promoted by collegial rather than adversarial relationships. Results from one reviewed study showed that CRNA autonomy was important for CRNA job satisfaction, whereas another research team reported that hierarchical supervision existed in CRNA practice settings where autonomy of CRNAs was restricted by anesthesiologists, with nearly 23% of CRNAs being required to accept the clinical decisions that the anesthesiologist made. Such conflicting situations, where CRNAs believed that their decisions were in the best interest of the patient for whom they were providing care but having to accept the decisions of other providers, led to CRNAs experiencing moral distress. In 2011 Radzvin determined that 38% of CRNAs felt powerless in dealing with physicians, with 17% of CRNAs compromising their ethical values and 30% fearing termination due to ethical decision making. Because of ethical issues, 9% considered leaving the nurse anesthesia specialty, and 10% of CRNAs considered leaving the nursing profession overall.

- **Work Relations of Certified Registered Nurse Anesthetists.** Work relations of CRNAs included ACT dynamics and occupational stress experienced by CRNAs with coping strategies for managing stress. Alves, in 2005, examined how scope of practice (SOP) and collaboration were related to occupational stress of CRNAs practicing in ACTs. The AANA defines unrestricted CRNA
<table>
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<tr>
<th>Author, year</th>
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<th>Sample</th>
<th>Study design</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Alves,22 2005</td>
<td>347</td>
<td>AANA member CRNAs from 6 New England states</td>
<td>Quantitative</td>
<td>• Hospital-employed CRNAs had higher SOP scores than anesthesiologist group-employed CRNAs. Higher educated were more likely to have broader SOP in ACTs. • Higher SOP translated to higher stress levels. • CRNAs with increased SOP or those who experienced work overload used appropriate coping resources.</td>
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<tr>
<td>Chipas &amp; McKenna,21 2011</td>
<td>7,537</td>
<td>AANA member CRNAs in all 50 states</td>
<td>Quantitative</td>
<td>• Changing jobs was highest rated personal stressor by 27.8% of CRNAs, followed by relocation (23.2%). • Student registered nurse anesthetists experience the most stress, followed by nurse anesthesia program faculty, followed by staff anesthetists. • Gastrointestinal, orthopedic, and miscellaneous illnesses were experienced 35.2%, 27.8%, and 24.3% of the time. • Interaction/support from others was most commonly reported coping mechanism, whereas 31% sought professional help.</td>
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<td>Elmblad et al,26 2014</td>
<td>385</td>
<td>AANA member CRNAs from Michigan</td>
<td>Mixed-methods</td>
<td>• CRNAs experienced moderately high levels of incivility from employee, nonemployee, and physician sources; moderate levels of incivility from CRNA colleagues; and low levels of incivility from supervisors. Workplace incivility and professional burnout were statistically significant.</td>
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<tr>
<td>Hyman et al,23 2011</td>
<td>145</td>
<td>Staff from 1 perioperative suite</td>
<td>Quantitative</td>
<td>• CRNAs had lower burnout scores (measured by MBI-HHS scores) than residents or experienced physicians, and CRNAs experienced the least amount of work satisfaction. Personal support contributed to decreased professional burnout among CRNAs.</td>
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<td>Jameson,28 2003</td>
<td>16</td>
<td>Convenience sample of anesthesiologists and CRNAs from 1 state</td>
<td>Qualitative</td>
<td>• Threat to identity: Communication between members combines positive assertions of in-group legitimacy with ambivalence toward the other group. • Distortion with revivification: CRNAs perceive a threat to their identity, whereas anesthesiologists distort the difference in training between groups. • Collusion: Members of each provider group emphasize differences between them. Dominance is present in anesthesiologist perceptions. Conflict can be either fueled or de-escalated.</td>
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<td>Jenkins et al,16 2006</td>
<td>96</td>
<td>Department of Army Civilian (DAC) and Army Nurse Corps (ANC) CRNAs</td>
<td>Quantitative</td>
<td>• Most frequently encountered ethical issue among DAC and ANC CRNAs was conflicts in nurse-physician or other professional relationship, with 23.7% reporting this occurring frequently and 41.2% reporting this occurring sometimes. • Second-most disturbing ethical issue among DAC and ANC CRNAs was conflicts in nurse-physician (or other professional) relationship, with 23.7% reporting this occurring frequently and 37.1% reporting this occurring sometimes.</td>
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<td>Jones &amp; Fitzpatrick,24 2009</td>
<td>270</td>
<td>Convenience sample of CRNAs and anesthesiologists from Texas</td>
<td>Mixed-methods</td>
<td>• Mean scores on attitudes toward collaboration was higher for CRNAs than for anesthesiologists. • Significant difference existed in attitudes by the interaction of gender and discipline on collaboration. • Key themes: Limited communication skills regarding teamwork created strained relationships between anesthesiologists and CRNAs, collaboration of anesthesiologists and CRNAs was best for patient safety, and CRNA autonomy was important for CRNAs’ SOP and job satisfaction.</td>
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<td>Kaplan et al,20 2007</td>
<td>283</td>
<td>CRNAs licensed in Washington</td>
<td>Quantitative</td>
<td>• Respondents were equally likely to be male or female; they tended to be over 50 years old and white, have on average 19 years of experience, practice in urban settings, and work in multiple settings. Consultation with an anesthesiologist ranged from 36.3% never consulting with an anesthesiologist to 20% consulting on every patient with an anesthesiologist; physicians were generally present and available for consultation.</td>
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Makary et al, 19 2006 2,135 All OR caregivers in a Catholic health system in 16 states
Quantitative  Percentage reporting high or very high level of collaboration: Anesthesiologists with each other: 96%, CRNAs with each other: 93%.
Percentage reporting high or very high level of collaboration between provider groups: 92% of anesthesiologists rated their collaboration with CRNAs as high or very high, whereas 75% of CRNAs rated their collaboration with anesthesiologists as high or very high.

Perry, 27 2005 35 Convenience sample of Tennessee and North Carolina CRNAs and peers
Qualitative  CRNA roles: Typical anesthesia duties, offering assistance or being a reliable co-worker or collaborator.
Responsibilities: patient care and safety, continuing education, administrative duties.
Stressors: Care-related stressors (newborn cases, deaths, patient complications), administrative stressors (workload, production pressure, CRNA shortage, not enough appreciation by anesthesiologists).
Coping: Remain calm, internalization, spiritual beliefs or prayer, humor.
Thematic analysis: Being an attentive, reliable co-worker alleviates antagonism in the OR, open communication is effective in addressing concerns and preventing conflict, occupation-related stressors create concern for patient safety, interpersonal work relations cause more stress than any other perceived stressors.

Radzvin, 18 2011 300 Random sample of AANA member CRNAs from Pennsylvania
Quantitative  CRNAs aged 24-30 years had higher levels of moral distress than any other age group.
CRNAs experience moderate levels of moral distress.
Of CRNAs, 38% felt powerless in dealing with physicians most of the time, 10% considered leaving the nursing profession because of ethical issues, and 9% had thought of leaving their nursing specialty/work setting in response to ethical problems. Thirty percent of CRNAs feared job loss because of their ethical decision making, and 17% of CRNAs reported compromising their ethical values in their work setting.

Sakellaropoulos et al, 25 2011 205 Random national sample of AANA member CRNAs
Mixed-methods  Most (92%) CRNAs experienced aggression in the workplace, with the most common ages affected 21-39 years, then decreasing with older age.
Female CRNAs experience all forms of aggression more often than male CRNAs.
A significant correlation existed between workplace aggression and workplace stress.
Key qualitative findings were that workplace aggression may have an effect on patient safety, and that oppression may contribute to workplace aggression.

Taylor, 17 2009 351 Convenience sample of anesthesiologists and CRNAs from 1 southwestern state
Quantitative  No difference on gender scores.
Attitudes on collaboration of CRNAs in this sample were significantly more positive than those of the anesthesiologists. Attitude toward collaboration decreased as percentage of practice with anesthesiologists increased. Correlation between attitude toward collaboration and years of experience was positive and significant for anesthesiologists, whereas it was negative and significant for CRNAs.

Table 1. Study Design and Findings
Abbreviations: AANA, American Association of Nurse Anesthetists; ACT, anesthesia care team; CRNA, Certified Registered Nurse Anesthetist; MBI-HSS, Maslach Burnout Inventory-Human Services Survey; OR, operating room; SOP, scope of practice.
SOP as provision of all aspects of anesthesia care to any aged individual for any medical, pain management, or surgical procedure in any location where anesthesia services are provided. Occupational stress has been defined in terms of work strain when job requirements do not match the capabilities or resources of the worker, which can evoke harmful physical and emotional responses within them. Alves’ study results showed that more than 88% of CRNAs practiced in ACTs. SOP restrictions were most evident in the preoperative period in requesting consultations or ordering diagnostic tests, and in the postoperative period in discharging patients from postanesthesia care units or managing chronic pain. In addition to SOP restrictions on CRNA practice, few CRNAs perceived their practice with anesthesiologists as collaborative, with CRNAs using compromise or avoidance in conflict resolution. Furthermore, CRNAs who were employed by hospitals scored higher on SOP compared with CRNAs who were employed by private physician groups. Regarding SOP and occupational stress, CRNAs with a less restrictive SOP experienced more occupational stress and role overload compared with CRNAs with a more restrictive SOP.

One study of CRNAs from across the United States reported average daily stress of 4.3 on a 10-point Likert scale (0 meaning no stress and 10 indicating maximum stress), with 50% of daily stress being attributed to occupational stress. The self-reported stress of CRNAs was slightly less than that of administrators or military CRNAs, whose mean stress scores were 5.1 and 4.9, respectively. Results also showed that the highest ranking personal stressors among CRNAs were changing jobs (28%), followed by relocating (23%). Perry, in 2005, investigated the perceived stress, coping strategies, and work relationships of CRNAs. The study found that CRNAs experience high levels of stress because of the nature of their clinical work, which was characterized by high workload and pressures from administrators to meet patient quotas. This pushed CRNAs to finish cases as quickly as possible, creating concern among them regarding their ability to provide safe care. Results also showed that interpersonal work relations between CRNAs and anesthesiologists or other professionals contribute to CRNA stress more so than any other job stressors.

Interpersonal work relations were concerning not only to civilian CRNAs but also to active-duty CRNAs. The 2006 study by Jenkins et al. of Army Civilian and Army Nurse Corps CRNAs identified that conflicts in the nurse-physician (or other professional) relationship were the most commonly experienced ethical issue among all CRNAs in the study. Civilian CRNAs ranked conflicts in this relationship as the third most frequently experienced ethical issue, whereas the military CRNAs ranked it as the most frequently experienced ethical issue. In addition, interpersonal work relation conflicts were also deemed one of the most personally disturbing ethical issues for both groups of CRNAs.

Certified Registered Nurse Anesthetist Outcomes. Nurse anesthesia workforce outcomes, including incivility, burnout, and workplace aggression, were described in the reviewed studies. Incivility in healthcare has been defined as deviant, disrespectful behavior intended to harm its target and has the potential to escalate to workplace aggression. Professional burnout has been described as the state of emotional and physical exhaustion experienced as a result of chronic, demanding work situations. Emlblad and colleagues, in 2014, studied CRNA workplace incivility and its relationship with CRNA professional burnout. Results showed that CRNAs experienced incivility from several sources, including physicians, nurses, and other hospital personnel as well as from nonemployee sources including patients and visitors. Furthermore, CRNA workplace incivility and burnout were positively correlated, and this relationship was statistically significant. In 2011 Hyman et al. studied professional burnout among CRNAs, experienced physicians (physicians with 5 or more years of postmedical school experience), and resident physicians (physicians with fewer than 5 years of postmedical school experience). Burnout was higher among both groups of physicians compared with CRNAs; however, CRNAs were the least satisfied with their work. Yet, CRNAs reported that personal support reduced burnout.

Workplace aggression, which has been defined as physical or verbal abuse, bullying, conflict, or threatening behaviors, was another outcome investigated among CRNAs. Sakellaropoulos et al. in 2011, studied aggression toward CRNAs to determine its prevalence in the workplace. Among CRNAs, 92% reportedly experienced active aggression, 90% experienced verbal aggression, and 83% experienced physical aggression from supervising physicians, which included surgeons and anesthesiologists. Female CRNAs experienced all forms of aggression more than male CRNAs did. Furthermore, the study showed a statistically significant positive correlation with workplace aggression increasing workplace stress, and qualitative results revealed that workplace aggression may lead to CRNA job dissatisfaction workplace stress, and having a negative effect on patient safety.

Discussion
This review synthesized the findings from the existing studies on CRNA working conditions and workforce outcomes. The following 4 themes emerged from the review of the studies: collaboration and communication, professional identity and autonomy, work relations of CRNAs, and CRNA outcomes. These themes, which are consistent with findings from other studies conducted with nurses, nurses practitioners, or physicians on their working conditions and outcomes, are important.
for policy makers and administrators to consider to promote CRNA practice.

This review found that CRNAs make use of a variety of communication techniques, such as collaboration, compromise, and avoidance, to navigate work relationships with anesthesiologists and other providers. Despite varying communication techniques, we found that as the percentage of ACT practice increases, role conflict between CRNAs and anesthesiologists increases, occupational stress of CRNAs increases, and CRNA job satisfaction decreases. These findings suggest that there may be an optimal percentage of ACT practice using a variety of communication techniques that would maximize CRNA contributions to care, promote patient safety, and improve CRNA outcomes. CRNAs are not the only advanced practice RN group that face similar work challenges. Similar findings have been reported in studies conducted with NPs. For example, when NP care is maximized, the overall health of patients improves, and the addition of NPs to physician practices with effective collaboration between providers improves patient outcomes. Furthermore, when practice environments support NP autonomy as well as NP-physician relationships, NP job satisfaction increases and turnover intent decreases. These findings are important for policy makers and administrators in organizations where CRNAs practice so they can determine the right mix of autonomy, collaboration, and teamwork that maximizes CRNA contributions to care while promoting job satisfaction and decreasing attrition. More research is needed to explore these complex relationships and how they might have an impact on CRNA outcomes to benefit the healthcare organizations where CRNAs practice and the patients for whom CRNAs care.

In designing more optimal practice arrangements, organizations and administrations should take steps to decrease conflict between anesthesiologists and CRNAs, promote professional identities of both providers, and encourage collaboration in clinical decision making. The reviewed literature shows the intractable conflict between anesthesiologists and CRNAs, which may be perpetuated by the overlap in clinical roles among them, as reported by both civilian and military CRNAs. Understanding how to best resolve conflict between providers, promote effective communication, and support CRNA decision making may help to improve CRNA-anesthesiologist relations and help value CRNA contributions. Furthermore, other researchers suggest that to foster optimal care delivery, hospitals must correct deficient interpersonal communication among providers. In optimizing CRNA care delivery, the promotion of independent decision-making ability may be one such contribution that may empower CRNAs. The literature suggests that empowering CRNAs to act autonomously may decrease their ethical decision-making dilemmas and allay fear of termination while maximizing their contributions to safe care provision. More research is needed in these areas so that policy makers will better understand how to foster conflict resolution between providers and design clinical practices with the right mix of autonomy and respectful collaboration that will minimize ethical decision-making dilemmas among CRNAs.

One attempt at mixing autonomy with collaborative practice is the ACT. The reviewed literature shows that CRNA SOP restrictions in ACT settings were most evident in the preoperative and postoperative periods, suggesting that CRNA care may be underutilized in these areas. Instituting a less restrictive SOP of CRNAs seems like a reasonable option in maximizing CRNA care; however, the literature also tells us that a less restrictive SOP is associated with increased occupational stress and role overload among CRNAs. Creating a balance in ACTs may promote a sense of accomplishment and increase job satisfaction. Similar findings have been reported by researchers in a study conducted among NPs practicing in nurse-managed health centers, reporting that sense of accomplishment and challenge in clinical work improved job satisfaction among NPs. This information has important implications for CRNAs; namely, care must be taken by the administration to utilize CRNAs to their full capacity, with considerations that will minimize occupational stress, while providing opportunities that prevent role overload, promote productivity, and increase job satisfaction.

The reviewed literature also tells us something about additional CRNA outcomes, including incivility, professional burnout, and workplace aggression that involve dysfunctional behaviors and interprofessional work relations involving a variety of providers. Incivility experienced by CRNAs is mainly attributed to employee, nonemployee, and physician sources. Furthermore, workplace incivility contributes to the development of professional burnout among CRNAs and other healthcare providers. When professional burnout is experienced by CRNAs, it can be reduced through factors of good health, work satisfaction, and personal support. This suggests that positive organizational influences could potentially reduce professional burnout through promotion of similar factors. Similar effects have been reported among hospital nurses, for whom positive care environments have been shown to decrease professional burnout and intent to leave a job, while increasing job satisfaction. Therefore, more robust research in this area could help organizations to better understand where to focus their attention to mitigate negative provider outcomes, including those of CRNAs.

This review is not without its limitations. Several are that the search was limited to literature published in the United States in peer-reviewed journals, focused on US CRNAs, and included studies published after 2001. As such, studies may have been missed because of the
search strategy used. Because study samples ranged from CRNAs in single states to national samples of CRNAs, external validity of synthesized findings may be limited. Also, bias was not addressed in 8 of the included studies; however, recruitment bias was possible in 4 studies and response bias was possible in 3 studies, possibly skewing results. In addition, quantitative data collected in 2 of the 11 mixed-methods or quantitative instruments used for which validation could not be determined perhaps invalidating conclusions made.

Despite these limitations, this review offers important information regarding CRNA working conditions and related outcomes. More rigorous research is needed to understand the full spectrum of working conditions of CRNAs, their complex interrelated nature, and how they collectively have an impact on CRNA outcomes and quality of care. Future research should focus on describing and measuring CRNA organizational climate and its impact on provider outcomes, which our research team is undertaking. Once established, intervention studies could be designed and implemented that would optimize CRNA outcomes and maximize CRNA contributions to care. Collectively, this research would be critical to improving work relationships between CRNAs and other providers; to promoting work conditions that benefit CRNAs, patients, and organizations where CRNAs practice; and to demonstrating high-quality provider and patient outcomes. Policy makers, healthcare organizations, CRNAs, and the patients and families they serve would benefit from such research.

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AUTHORS
Donald Boyd, PhD, MS, CRNA, is a recent graduate of the PhD program at the Columbia University School of Nursing, and a staff anesthetist at New York-Presbyterian Hospital, Columbia Campus. Dr Boyd is a CRNA of 11 years and is an active member and past president of the New York State Association of Nurse Anesthetists. Email: Drb2102@cumc.columbia.edu.

Lusine Poghosyan, PhD, MPH, RN, FAAN, is a nationally recognized health services researcher with expertise in studying primary care organizations, primary care workforce, teamwork, and quality of patient care, especially for chronic diseases.

DISCLOSURES
The authors declare they have no financial relationships with any commercial entity related to the content of this article. The authors did not discuss off-label use within the article.