

Attitudes Toward Physician-Nurse Collaboration in Anesthesia

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The purpose of this study was to compare the attitudes of anesthesiologists and nurse anesthetists toward collaboration with each other. Data for this descriptive, comparative study were gathered through a mailed survey to 501 nurse anesthetists and 353 anesthesiologists licensed to practice in 1 state of the United States. Attitude toward collaboration was measured using an adaptation of the Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration. The mean total scores were compared using the t test for independent groups.

Mean total scores were higher for the nurse anesthetist group (n = 238) compared with the anesthesiologist group (n = 66). Analysis demonstrated that this

difference was significant (t = 14.6, P < .05). Additional analyses failed to show a significant difference based on sexual gender.

The results of this study provide some evidence that the divergent perspectives regarding collaboration previously demonstrated between physicians and nurses may also exist in the specialty field of anesthesia. This study provided no support for the supposition that gender contributes to the differences in attitude toward collaboration between physicians and nurses.

Keywords: Anesthesiology, collaboration, delivery of healthcare, nurse anesthetist, physician-nurse relationship.

When anesthesiologists and nurse anesthetists work together, the nature of their interactions has the potential to influence the patient care they provide. Collaboration describes interactions in which professionals work together cooperatively, with shared responsibility and interdependence.¹ Collaboration among healthcare workers has been advocated as a way to improve care delivery in an increasingly complex healthcare system.² Physician-nurse collaboration has beneficial and desirable effects for patients and providers.^{1,3,4} Differences between nurses' and physicians' perceptions of collaboration have been a consistent theme in research.⁵⁻⁸ Studies of collaboration in the anesthesia setting remain scant. The purpose of this study was to compare the attitudes of anesthesiologists and nurse anesthetists toward collaboration with each other.

• **Background.** Many positive correlations between physician-nurse collaboration and patient satisfaction, staff satisfaction, staff retention, patient outcomes, and reduced costs can be found in comprehensive reviews of the literature.^{3,9} Collaborative physician-nurse interactions have been associated with improved patient care delivery,¹⁰⁻¹³ including lower than expected intensive care unit (ICU) patient mortality.¹⁴ Collaboration has been shown to maximize output and efficiency in business,¹⁵ making physician-nurse collaboration appealing to healthcare managers. Physician-nurse collaboration has been called an ethical imperative, because of its association with patient care quality.⁷

Yet, nurses and physicians view collaboration differ-

ently. Physicians have rated collaboration levels higher than their nursing counterparts,^{8,13,16-19} and nurses have valued collaboration more significantly than physicians.¹⁹ In a multicenter study of surgeons, anesthesiologists, nurse anesthetists, and operating room nurses, physicians were more satisfied with physician-nurse collaboration than nurses.^{20,21}

Physician-nurse collaboration is rich with complexity. Early theories conceptualized collaboration as a balance of assertiveness and cooperation.²² As the understanding of collaboration evolved, recognition of the need for more fully developed explanatory models has grown.^{3,4,23,24} Successful collaborative interactions are nonhierarchical, with power shared among participants who are considered collegial equals.²³ Research designed to examine attitudes among the collaborating participants would contribute to our further understanding of these influences, and why physicians and nurses perceive the collaborative interaction differently.

• **Anesthesiologists and Nurse Anesthetists Working Together.** While anesthetics may be delivered by a sole professional (either an anesthesiologist or a nurse anesthetist), large numbers of nurse anesthetists (80%) and anesthesiologists (79%) report practice arrangements in which the 2 types of professionals work together.^{25,26} Anesthesia nursing is a unique specialty. In all other areas of healthcare, there are clear demarcations distinguishing which tasks are appropriate for physicians versus nurses.²⁷ The appropriate roles and responsibilities for each type of provider, working separately or together, has been the subject of heated debate within the anesthesia

community and among US health policy makers. Analyses of the relative merits of the different types of practice arrangements have primarily focused on patient outcomes and complications.²⁸⁻³³ Less study has been given to the nature of the interactions between nurse anesthetists and anesthesiologists when they work together.

In a survey of faculty associated with nurse anesthesia educational programs, nurse anesthetists rated the importance of collaborative behaviors significantly higher than anesthesiologists and multiple areas of conflict were identified.³⁴ In a separate study of nurse anesthetists who worked with anesthesiologists collaboration levels were low, but no data were collected from anesthesiologists. Scope of practice was directly related to collaboration, meaning that nurse anesthetists in practice arrangements that allowed them to perform closer to their full potential perceived higher levels of collaboration.³⁵

Materials and Methods

This descriptive, comparative study examined 2 naturally occurring groups (anesthesiologists and nurse anesthetists) to determine differences in attitudes toward collaboration, as measured by the adapted Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration. One state in the southeastern United States was chosen as the setting for this study. Data were obtained from each group once via a mailed survey. The research protocol received appropriate Institutional Review Board approval.

Data regarding attitudes toward collaboration were gathered using an adaptation of the Jefferson Scale of Attitudes Toward Physician-Nurse collaboration.³⁶ The Jefferson scale is a survey consisting of 15 items answered on a 4-point Likert-type scale. Attitude toward collaboration is reflected by the total score on the Jefferson scale, ranging from 15 to 60, with higher scores indicating more positive attitudes. Psychometric analysis of the scale established reliability coefficients in the 0.80 range, and factor analysis supported construct validity of the scale.³⁶

The Jefferson scale as originally developed uses the terms *physician* and *nurse* in the items. The Jefferson scale was adapted for use in anesthesia by substituting the word *anesthesiologist* for *physician* and substituting *CRNA* (referring to Certified Registered Nurse Anesthetist) for *nurse*. Permission to use the Jefferson scale, adapted as described, was obtained from the tool's author.

Surveys were mailed to nurse anesthetists (n = 501) who reported a home address in the specified state to the American Association of Nurse Anesthetists. Surveys were mailed to physicians (n = 353) who listed anesthesiology as their specialty with the State Board of Medicine. Coded responses were entered into an electronic database using Statistical Package for the Social Sciences (SPSS) computer software (SPSS Inc, Chicago, Illinois).

Results

Fifty-seven percent (n = 284) of the nurse anesthetists and 19% (n = 67) of the anesthesiologists returned a survey. Some returned surveys had pages of questions not completed and were not included in the data analysis. Some returned surveys had less than 10% of the questions unanswered. The data from these surveys were included in the analysis, after replacement of the missing data using the mean of the participant's other responses.

Previous studies using the Jefferson scale demonstrated differences between physicians' and nurses' attitudes toward collaboration with Cohen's *d* effect sizes ranging from 0.50 to 1.3.^{37,38} At this effect size in order to achieve a power of 0.80 with a significance level of .05 (2 independent group *t* test), each group needed at least 65 individuals.³⁹

- *Sample Characteristics.* Demographic characteristics of the sample are summarized in Table 1. Anesthesiologists and nurse anesthetists were similar in age (late 40s) and years of anesthesia experience (more than 10). Anesthesiologists in this sample were primarily male (76%), while nurse anesthetists were primarily female (66%). Nurse anesthetists were almost exclusively white (95%). Anesthesiologists were primarily white (74%) with some Asian/Indian (18%) and Hispanic respondents (2%).

Anesthesiologists and nurse anesthetists were asked what percentage of their practices involved nurse anesthetists and anesthesiologists working together. Responses covered the entire range of 0% to 100% in both groups. Anesthesiologist practices were evenly divided between large urban hospitals (41%) and small community hospitals (44%). Nurse anesthetists reported practices in small community hospitals (48%) slightly more than practices in large urban hospitals (36%). Large numbers of anesthesiologists in this sample reported membership in their national professional organization (86%) and separate membership in their state organization (79%). Nurse anesthetists reported near universal membership in their joint national/state professional association (99%).

Cronbach's alpha was calculated as a measure of reliability of the Jefferson scale adaptation. Total score reliability results for the total sample ($r = .894$) and the anesthesiologist group ($r = .844$); the total score reliability coefficient for the nurse anesthetists was lower ($r = .654$). Mean scores between the 2 groups were compared using the *t* test for independent groups; there was a significant difference between anesthesiologists and nurse anesthetists in total score ($t = 14.6, P < .05$). These results are presented in Table 2.

- *Additional Analyses.* These data were examined for the effect of gender on attitude toward collaboration, using a 2-way analysis of variance for gender and discipline. The analysis confirmed the results of the *t* test

	Anesthesiologists n = 66 (percent of sample)	Nurse anesthetists n = 238 (percent of sample)
Gender^a		
Male	50 (75.8)	76 (31.9)
Female	14 (21.2)	157 (66.0)
Age (y)^a		
< 35	2 (3.0)	40 (16.8)
35-44	16 (24.2)	57 (23.9)
45-54	28 (42.4)	76 (31.9)
55-65	14 (21.2)	48 (20.2)
> 65	6 (9.1)	17 (7.1)
Ethnicity/race^a		
White	49 (74.2)	227 (95.4)
Black	0	3 (1.3)
Asian/Indian	12 (18.2)	1 (0.4)
Hispanic	1 (1.5)	1 (0.4)
Years experience^a		
< 2	0	28 (11.8)
2-5	9 (13.6)	36 (15.1)
6-10	8 (12.1)	33 (13.9)
11-20	27 (40.9)	55 (23.1)
> 20	22 (33.3)	86 (36.1)
Percentage of practice that involves nurse anesthetists and anesthesiologists working together^a		
None	4 (6.1)	26 (10.9)
< 50%	11 (16.5)	14 (5.9)
50-75%	11 (16.6)	14 (5.9)
80-99%	25 (37.8)	36 (16.8)
100%	13 (19.7)	139 (58.4)
Practice setting^a		
Large, urban	27 (40.9)	86 (36.1)
Small, community	29 (43.9)	114 (47.9)
Outpatient	3 (4.5)	15 (6.3)
Office	0	2 (.8)
Nonclinical	0	3 (1.3)
Multiple	5 (7.6)	8 (3.4)
Retired or on leave	1 (1.5)	8 (3.4)
Professional organization membership		
National	57 (86.4)	235 (98.7)
State	52 (78.8)	235 (98.7)

Table 1. Sample Description

^a Some numbers do not add to the N of 304 because of incomplete responses.

demonstrating the significant effect of provider discipline on attitude toward collaboration. The effects of gender and the interaction of gender and discipline were not significant. These results are included in Table 3.

Correlation coefficients were calculated in order to determine if there was a relationship between attitude toward collaboration and percentage of practice arrangement in which anesthesiologists and nurse anesthetists work together. The correlation between attitude toward collaboration (total Jefferson score) and percentage of

practice arrangement in which nurse anesthetists and anesthesiologists work together was not significant in anesthesiologists ($r = .13$). The correlation was significant for nurse anesthetists ($r = -.13$, $r^2 = .02$). These results are included in Table 4.

Correlation coefficients were calculated in order to determine if there was a relationship between attitude toward collaboration and years of anesthesia experience. The correlation between attitude toward collaboration (total Jefferson score) and years of anesthesia experience

	Anesthesiologists (mean ± SD, n = 66)	Nurse anesthetists (mean ± SD, n = 238)	t	df	P	Effect size r ²
Total Jefferson score	43.8 ± 6.4	55.7 ± 3.0	14.6	72.9	.000 ^a	.75

Table 2. Results and Comparisons of Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration, Total Scores

^a Difference significant at the .05 level, with the 2-tailed *t* test.

Source of variation	F (1,293)	P	Effect size (partial η ²)
Discipline	329.5	.000 ^a	.53
Gender	.57	.449	—
Discipline-gender interaction	.35	.553	—

Table 3. Results of 2-Way Analysis of Variance, Effect of Gender and Discipline on Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration Total Score

^a Difference significant at the .05 level.

	Pearson correlation <i>r</i>	P
Anesthesiologists (n = 65)	.14	.265
Nurse anesthetists (n = 229)	-.13	.043 ^a

Table 4. Correlation of Percentage Practice Arrangement in Which Anesthesiologists and Nurse Anesthetists Work Together and Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration Total Score

^a Results significant at the .05 level.

	Pearson correlation <i>r</i>	P
Anesthesiologists (n = 64)	.328	.031 ^a
Nurse anesthetists (n = 232)	-.142	.043 ^a

Table 5. Correlation of Years of Anesthesia Experience and Jefferson Scale of Attitudes Toward Physician-Nurse Collaboration Total Score

^a Results significant at the .05 level.

was significant in anesthesiologists ($r = .328, r^2 = .11$). The correlation was significant for nurse anesthetists, in a negative direction ($r = -.142, r^2 = .02$). These results are included in Table 5.

Discussion

Many have concluded that nurses are more interested in physician-nurse collaboration than physicians. Nurses have authored most of what is written on the subject⁹ and have been more involved in the associated research activities than their physician counterparts.¹⁹ The lower anesthesiologist response rate (19% compared with 57% for nurse anesthetists) in this study is consistent with that of physicians in other studies.¹³ The purpose of this study was to compare the attitudes of anesthesiologists and nurse anesthetists toward collaboration. The attitudes of the nurse anesthetists in this sample were significantly more positive than those of the anesthesiologists, a result

consistent with previous findings between other types of physicians and nurses.

Most attempts to understand physician-nurse collaboration have been anecdotal, subjective, and speculative.⁹ The influence of gender has been suggested as an explanation for differences in attitude toward collaboration found in previous studies.^{9,24,37,40} Explicit testing of the influence of gender has been hampered by the continued disproportionate gender distribution between medicine and nursing. Examinations of physicians and nurses in 4 countries demonstrated differences in attitudes toward collaboration that were independent of gender.^{37,38} This study of anesthesiologists and nurse anesthetists also failed to show an influence of gender on collaboration scores. The significance of this finding is strengthened by the considerable proportion of males in the nurse anesthetist sample (32%). Future investigations into the role of gender in collaboration could consider taking advantage of the large number

of nurse anesthetists who are male (nationally 45%, conversation with L. Rivera, October 24, 2006). Anesthesiology remains predominately male, with only 22% of the national population being female.⁴¹

Among the nurse anesthetists in this study, attitude toward collaboration decreased as percentage of practice with anesthesiologists increased. Scope of practice has been found to be positively correlated to collaboration in nurse anesthetists.³⁵ Perhaps nurse anesthetists experience more restriction to their practice as the percentage of practice with anesthesiologists increases. Unrecognized factors may be involved as well. In this study, years of anesthesia experience were associated with more positive attitudes toward collaboration in anesthesiologists and less positive in nurse anesthetists. This may reflect a “generation-gap” effect, or it may be that attitude toward collaboration changes as professionals gain more experience. Research designed to explore these issues further could add to our understanding of collaboration.

• **Implications for Practice.** As healthcare practice patterns evolve closer toward collaborative teams, more tension is created within the system paradoxically forcing the participants further apart and creating conflict.⁴⁰ Increasing discrepancies between physicians’ and nurses’ attitudes may contribute to increasing levels of conflict. The gap in attitudes toward inter-professional collaboration was found to be higher in countries that encouraged a collaborative, complimentary role model of physician-nurse interaction than in those with more traditional role expectations.³⁸ The large effect size ($r^2 = .75$) associated with the difference in anesthesiologists’ and nurse anesthetists’ attitudes in this study may be part of the source for the conflict that is evident in some anesthesiologist-nurse anesthetist interactions.

• **Future Research.** The results of this study provide some evidence that the divergent perspectives regarding collaboration previously demonstrated between physicians and nurses may also exist in the specialty field of anesthesia. The use of a convenience sample in this study limits the generalization of these findings. Replication of this study with a randomized sample of the national population of anesthesiologists and nurse anesthetists would be valuable. This study provided no support for the supposition that gender contributes to the differences in attitude toward collaboration between physicians and nurses. More studies are needed to specifically test for the influence of gender on physician-nurse collaboration. Scope of practice may have an effect on attitude toward collaboration, but it was not addressed in this study. Research into the interactions of anesthesia care practice arrangement, scope of practice, and collaboration needs to be done. Continued inquiry into collaboration and meaningful dialogue between anesthesiologists and nurse anesthetists can help build the environment of mutual respect that is essential for collaborative interaction.³

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