ANESTHESIOLOGY

Anesthesiologist Age and Sex Influence Patient Perceptions of Physician Competence

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EDITOR'S PERSPECTIVE

What We Already Know about This Topic

- The effects of anesthesiologist age and sex on patients' perception of competence and leadership remain unknown

What This Article Tells Us That Is New

- The authors used standardized videos of male and female actors and younger and older actors portraying anesthesiologists
- Older actors were rated as more confident and intelligent and were more often selected as leaders, but only among patients aged less than 65 yr
- Female actors were rated as more confident and were more likely to be selected to care for a family member, but only among white patients
- Age and sex both influence patient perceptions of desirable characteristics in anesthesiologists, and perceptions differ as a function of patient characteristics

ABSTRACT

Background: Uncovering patients' biases toward characteristics of anesthesiologists may inform ways to improve the patient–anesthesiologist relationship. The authors previously demonstrated that patients prefer anesthesiologists displaying confident body language, but did not detect a sex bias. The effect of anesthesiologists' age on patient perceptions has not been studied. In this follow-up study, it was hypothesized that patients would prefer older-appearing anesthesiologists over younger-appearing anesthesiologists and male over female anesthesiologists.

Methods: Three hundred adult, English-speaking patients were recruited in the Preanesthesia Evaluation and Testing Center. Patients were randomized (150 per group) to view a set of four videos in random order. Each 90-s video featured an older female, older male, younger female, or younger male anesthesiologist reciting the same script describing general anesthesia. Patients ranked each anesthesiologist on confidence, intelligence, and likelihood of choosing the anesthesiologist to care for their family member. Patients also chose the one anesthesiologist who seemed most like a leader.

Results: Three hundred patients watched the videos and completed the questionnaire. Among patients younger than age 65 yr, the older anesthesiologists had greater odds of being ranked more confident (odds ratio, 1.92; 95% CI, 1.41 to 2.64; $P < 0.001$) and more intelligent (odds ratio, 2.24; 95% CI, 1.62 to 3.11; $P < 0.001$), and had greater odds of being considered a leader (odds ratio, 2.62; 95% CI, 1.72 to 4.00; $P < 0.001$) when compared with younger anesthesiologists. The preference for older anesthesiologists was not observed in patients age 65 and older. Female anesthesiologists had greater odds of being ranked more confident (odds ratio, 1.46; 95% CI, 1.13 to 1.87; $P = 0.003$) and more likely to be chosen to care for one's family member (odds ratio, 1.80; 95% CI, 1.40 to 2.31; $P < 0.001$) compared with male anesthesiologists. The ranking preference for female anesthesiologists on these two measures was observed among white patients and not among nonwhite patients.

Conclusions: Patients preferred older anesthesiologists on the measures of confidence, intelligence, and leadership. Patients also preferred female anesthesiologists on the measures of confidence and likelihood of choosing the anesthesiologist to care for one's family member.

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Patient perceptions of their physicians are important as positive perceptions may improve the physician–patient relationship, which can have measurable positive healthcare outcomes.[1–5] Physical and nonphysical factors may contribute. For example, physician attire has been shown to influence patient perceptions of their physicians,[6–9] and patient perception of increased cultural competency of their physician has been associated with improved compliance to medical recommendations and increased satisfaction.[10] The physician–patient relationship is particularly important in the perioperative setting, where patient anxiety may be detrimental to patients' outcomes and experiences. Perioperative anxiety has been associated with increased likelihood of nerve block failure[11] and increased postoperative pain.[12,13] Anesthesiologists face the unique challenge of having only a limited amount of time during the preoperative interview to gain their patients' and support persons' trust in a high-stress setting before caring for them in the operating room. Thus, understanding factors that positively or negatively influence patient perceptions

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of anesthesiologists may help elucidate ways to improve the patient–anesthesiologist relationship and the patient's surgical experience and outcome. A better understanding of baseline patient perceptions and preferences may help us design training programs to help anesthesiologists adopt tools to improve their patients' perceptions and determine if there are cohorts of anesthesiologists that may benefit the most from such training.

We previously investigated the effect of anesthesiologist sex and body language on patient perceptions of anesthesiologist confidence, intelligence, likelihood of choosing the anesthesiologist to care for their family member, and leadership abilities.[14] We found that actor anesthesiologists who demonstrated confident, high-power body language were more likely to be ranked as confident and intelligent, more likely to be chosen to care for one's family member, and more likely to be to be considered a leader. Patient ranking of these qualities was not affected by sex of the actor anesthesiologists.

The absence of a sex bias in patient preferences among actor anesthesiologists in this study was encouraging, yet surprising given the presence of well-documented sex bias that exists within the field of anesthesiology,[15,16] and medicine at large,[17,18] despite increasing representation of women in medicine. Similarly, age may influence patients' perceptions of physicians. Age biases in medicine would suggest that older-appearing anesthesiologists may be perceived as wiser and more experienced; however, a study of over 700,000 hospital admissions between 2011 to 2014 reported that patients treated by older physicians had higher mortality than those patients cared for by younger physicians, except when the older physicians were treating high volumes of patients.[19] Our findings raised the following question: Do factors such as age and sex influence patient perceptions of anesthesiologists?

The aim of this follow-up study was to investigate whether patient perceptions of anesthesiologist competence is influenced by the age or sex of the anesthesiologist while controlling for body language. We hypothesized that patients would perceive older-appearing anesthesiologists as more confident, more intelligent, and more like a leader, and would be more likely to choose them to care for a family member when compared with younger-appearing anesthesiologists. We also hypothesized that there would be an interaction between anesthesiologist age and sex and that patients would prefer older-appearing male anesthesiologists over both younger- and older-appearing female anesthesiologists.

Materials and Methods

After approval by the institutional review board (University of Virginia Health System, Charlottesville, Virginia), 300 patients presenting to the University of Virginia Health System Preanesthesia Evaluation and Testing Center (Charlottesville, Virginia) who met inclusion criteria were enrolled in the study between July 1, 2019, and July 25, 2019. Patients were excluded if they were less than 18 yr old and/or did not speak English. Patients were enrolled and participated in the study before their consultation with the nurse or anesthesiology resident. The institutional review board waived the requirement for written informed consent because no patient identifiers were collected. Participants reviewed the study information letter before agreeing to participate.

Figure 1 illustrates the organization of the study. After obtaining verbal consent, each participant viewed four videos in a quiet room in the Preanesthesia Evaluation and Testing Center. Each video lasted approximately 90 s and contained a nonphysician actor anesthesiologists describing general anesthesia and the associated risks. The video set was comprised of one younger male, one younger female, one older male, and one older female actor anesthesiologist played in random order. Each actor anesthesiologist recited the same script and sat in a chair while displaying the same confident body language pose during their video. A second video set (Video Set B) was created with a separate group of nonphysician actor anesthesiologists in an attempt to control for unmeasured actor preferences. We recruited white actors in two age groups: the younger actor anesthesiologists were approximately the same age (all in their 30s) as were the older actor anesthesiologists (late 50s to early 60s).

Participants were randomized to view either Video Set A or Video Set B, and the four videos within the video set were displayed in random order. A permutation generator (http://www.textMechanic.com; accessed June 11, 2019) was used to generate a list of all 24 permutations of possible video order display for Video Set A. This list of 24 permutations was repeated to create a list of 144 combinations. A random number generator tool (http://www.random.org; accessed June 11, 2019) was used to choose 6 options from the original 24 permutations to create a completed list of 150 combinations. This process was repeated to create a list of 150 permutations of video order display from Video Set B. The two lists were combined to create a list of 300 total video order combinations. A list randomizer tool (Random.org) was used to randomize the 300 video order combinations. This final list was used to assign each patient participant to the video set and order of videos displayed as each participant was recruited.

After viewing all four videos of actor anesthesiologists, participants completed a questionnaire. Participants were asked to rank each anesthesiologist in order of confidence, intelligence, and likelihood of choosing that anesthesiologist to care for their family member. Participants also chose the one anesthesiologist who seemed most like a leader. Participant demographic data including age, sex, and ethnicity were collected. The questionnaire is provided in the appendix.

Statistical Analysis

The questionnaire items on confidence, intelligence, and care of family member were measured on a ranking scale from

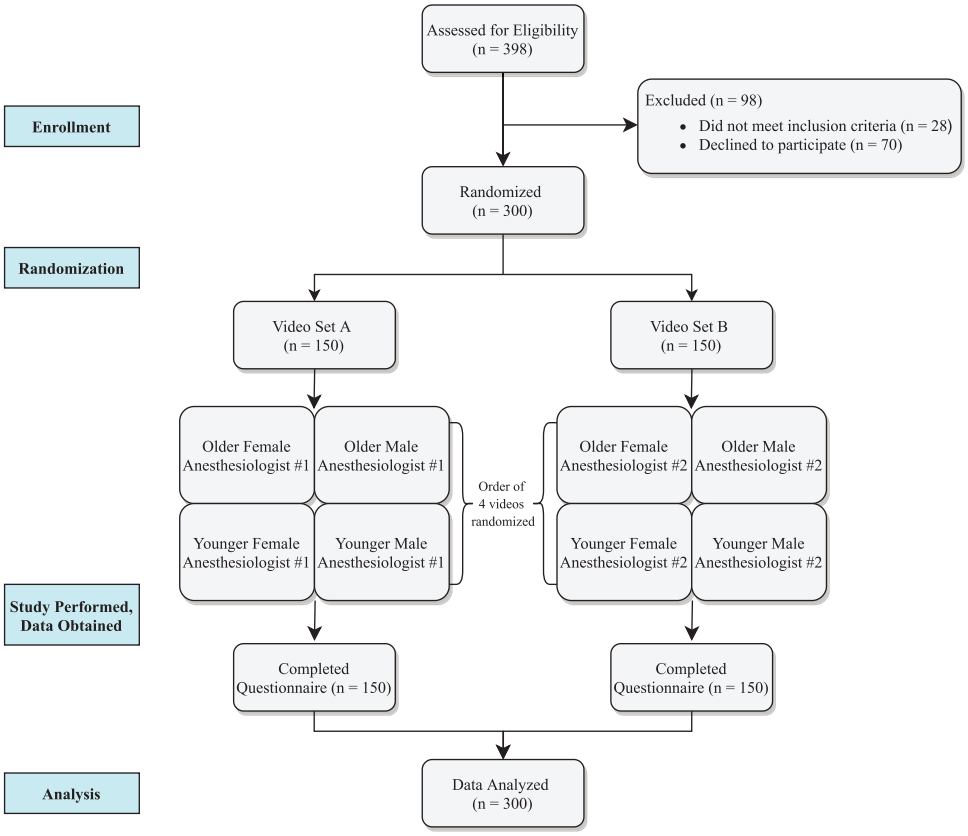

Fig. 1. This Consolidated Standards of Reporting Trials (CONSORT) flow diagram illustrates the organization of the study, including enrollment, randomization, and data analysis.

1 to 4 with 1 representing the best anesthesiologist and 4 representing the worst anesthesiologist for each measure, and the item on leadership was measured as a binary indicator. A power analysis revealed that enrolling 300 patients would provide sufficient (over 80%) power to detect a difference, if one existed, in ranking of one-half level or greater with a variance of 1 level for anesthesiologist age or sex on the response measures (confidence, intelligence, care of family member). The power analysis was conducted in linear models with repeated measures, assuming two factors (*e.g.,* age and sex) and their interaction. This layout allowed for several different scenarios—one or both factors and/or their interactions, potentially associated with ranking. We assumed two-sided tests and chose a conservative alpha of 0.0167 to account for multiple comparisons. We recruited 300 participants.

The responses for questionnaire items on confidence, intelligence, care of family member, and leadership were repeated measures at the patient level, and thus correlated. These responses were analyzed using the generalized estimating equation method to account for their correlations within patients. The generalized estimating equation method is an extension of generalized linear model for correlated responses (continuous, binary, or discrete), which are measured repeatedly for an individual. The regression coefficients and standard errors are estimated by iteratively solving a system of equations with incorporating a prespecific working correlation structure for the correlated responses.[20,21] Under the generalized estimating equation framework, even if the working correlation structure is less accurately specified, the estimated parameters remain valid. In our analyses, confidence, intelligence, and care of family member were considered as ordinal outcomes in multinomial logistic regression models, and leadership as a binary outcome in a logistic regression model, where within-patient correlations were accounted for *via* a compound symmetry working correlation. Our primary goal was to determine whether the actor anesthesiologists' age and sex affected participants' rankings. The anesthesiologist- and patient-specific characteristics were considered as the main effects in the models, although we also tested for potential interactions between the actor anesthesiologists' age and sex, interactions between the patients' and actor anesthesiologists' age, and interactions between the patients' and actor anesthesiologists' sex. Patient age was grouped into

Table 1. Demographic Data Including Age, Sex, and Ethnicity for the Two Participant Groups Randomized to View Video Set A and Video Set B

Participant Demographics	Video Set A (n = 150)	Video Set B (n = 150)	Total (n = 300)
Age			
Range	20–88	19–89	19–89
Mean ± SD	60 ± 15	60 ± 15	61 ± 15
Sex			
Male (%)	60 (40)	67 (45)	127 (42)
Female (%)	90 (60)	83 (55)	173 (58)
Ethnicity			
White (%)	129 (86)	117 (78)	246 (82)
Black/African American (%)	17 (11)	30 (20)	47 (16)
Hispanic/Latino (%)	3 (2)	2 (1)	5 (2)
Asian (%)	1 (1)	1 (1)	2 (1)
Other (%)	0 (0)	0 (0)	0 (0)

age 65 yr and older *versus* age less than 65 yr when testing the interaction between patients' and actor anesthesiologists' age. If the interactions were nonsignificant, they would not be included in the final models. The potential confounding effects of different actors in the two video sets were considered initially in the regression analyses but not included in the final models because of their nonsignificant effects. The final models did include adjustment for patients' age, sex, and ethnicity. A two-sided test with P value less than 0.0167 that accounts for multiple comparisons was considered statistically significant. All data analyses were performed using SAS version 9.4 (SAS Institute, Inc., USA), particularly using Proc GENMOD for the generalized estimating equation modeling.[22] The marginal effects of anesthesiologist- and patient-specific characteristics on the outcomes of interest were estimated and reported.

Results

Three hundred ninety-eight patients were approached about possible enrollment in the study (fig. 1). Ninety-eight total patients were excluded. Twenty-eight of the excluded patients did not meet inclusion criteria, and 70 patients who met inclusion criteria and were approached about possible enrollment in the study declined to participate. Three hundred patients viewed the four videos and completed the questionnaire. Table 1 depicts demographics for the patient participants randomized to view Video Set A and Video Set B. There was no observed difference in age, sex, or race of the patients randomized to each video set (data not shown). Female patients who participated in the study were on average 4 yr younger than the male participants.

Results of the questionnaire data for the three ranked primary outcomes (confidence, intelligence, and likelihood of choosing the anesthesiologist to care for their family member) are provided in table 2. Two of the participants declined to rank the actor anesthesiologists on their perceived order of intelligence. Lower-numbered scores (scores closer to 1) indicate the participant ranked that anesthesiologist more highly as the anesthesiologists were ranked on a scale of 1 to 4 with 1 representing the best anesthesiologist for each measure.

Confidence

Both age and female sex of the anesthesiologist were associated with higher patient ranking of the anesthesiologist's confidence (table 3). We also observed interactions between the age of the patient and age of the anesthesiologist and between patient ethnicity and sex of the anesthesiologist. Among younger patients (less than 65 yr old), older anesthesiologists had greater odds of being ranked more confident than the younger anesthesiologists (odds ratio, 1.92; 95% CI, 1.41 to 2.64; $P < 0.001$). Among older patients (age 65 and older), age of the anesthesiologist was not associated with differences in ranking on the measure of confidence (odds ratio, 0.83; 95% CI, 0.59 to 1.19; $P = 0.310$). Regarding preference for sex of the anesthesiologist on the ranking of confidence, we observed a significant interaction between the anesthesiologist's sex and patient participants' ethnicity. Among white participants, the female actor anesthesiologists had greater odds of being ranked more confident than

Table 2. Results (Mean and Median) for the Ranked Outcome Measures: Confidence, Intelligence, and Likelihood of Choosing the Anesthesiologist to Care for a Family Member

	Confidence			Intelligence			Care for Family Member		
	n	Mean (95% CI)	Median [25th, 75th]	n	Mean (95% CI)	Median [25th, 75th]	n	Mean (95% CI)	Median [25th, 75th]
Older female	300	2.4 (2.3–2.5)	2 [2, 3]	298	2.4 (2.2–2.5)	2 [1, 3]	300	2.4 (2.3–2.5)	2 [2, 3]
Older male	300	2.5 (2.3–2.6)	2 [1, 3]	298	2.4 (2.3–2.5)	2 [1, 4]	300	2.6 (2.5–2.7)	3 [2, 4]
Younger female	300	2.5 (2.3–2.6)	2 [1, 3]	298	2.5 (2.4–2.6)	3 [2, 3]	300	2.3 (2.2–2.4)	2 [1, 3]
Younger male	300	2.7 (2.6–2.9)	3 [2, 4]	298	2.7 (2.6–2.9)	3 [2, 4]	300	2.7 (2.6–2.8)	3 [2, 4]

Lower scores represent the anesthesiologist was ranked more highly on a scale of 1 to 4 (with 1 representing the best anesthesiologist for that measure). Values are expressed as number of responses (n), mean (95% CI), and median [25th, 75th percentile].

Table 3. Odds Ratios with 95% CI for Age (Older *vs.* Younger Anesthesiologist) and Sex (Female *vs.* Male Anesthesiologist) for the Ranked Outcome Measures: Confidence, Intelligence, and Likelihood of Choosing the Anesthesiologist to Care for a Family Member Adjusted for Age, Sex, and Ethnicity of Participants

Outcome Measure	Odds Ratio	95% CI		*P* Value
		Lower	Upper	
Confidence				
Age (older), participants < 65 yr	1.92	1.41	2.64	< 0.001
Age (older), participants ≥ 65 yr	0.83	0.59	1.19	0.310
Sex (female), white participants	1.46	1.13	1.87	0.003
Sex (female), nonwhite participants	0.82	0.50	1.33	0.425
Intelligence				
Age (older), participants < 65 yr	2.24	1.62	3.11	< 0.001
Age (older), participants ≥ 65 yr	0.85	0.61	1.19	0.339
Sex (female), all participants	1.24	0.98	1.58	0.076
Care for family member				
Age (older), all participants	1.02	0.80	1.30	0.885
Sex (female), white participants	1.80	1.40	2.31	< 0.001
Sex (female), nonwhite participants	0.91	0.57	1.47	0.712

For each outcome measure, only significant interactions between anesthesiologist characteristics (age and sex) and participant characteristics (age, sex, and ethnicity) were included in the final model. For confidence, the interaction between anesthesiologist age and participant age and that between anesthesiologist sex and participant ethnicity were significant. For intelligence, the interaction between anesthesiologist age and participant age was significant. For care of family member, the interaction between anesthesiologist sex and participant ethnicity was significant. The interaction between anesthesiologist age and anesthesiologist sex was nonsignificant in all models and thus was dropped from the model.

the male actor anesthesiologists (odds ratio, 1.46; 95% CI, 1.13 to 1.87; $P = 0.003$). Among nonwhite participants, there was no difference in confidence ranking based on sex of the anesthesiologist (odds ratio, 0.82 for female *vs.* male; 95% CI, 0.50 to 1.33, $P = 0.425$). Patient participant sex was not associated with differences in patient ranking of actor anesthesiologist confidence.

Intelligence

Age of the anesthesiologist was associated with higher patient ranking of anesthesiologist intelligence, and we observed an interaction between patient age and anesthesiologist age. Among younger patients, the older actor anesthesiologists had greater odds of being ranked more intelligent than younger actor anesthesiologists (odds ratio, 2.24; 95% CI, 1.62 to 3.11; $P < 0.001$; table 3). Among older patients, age of the anesthesiologist was not associated with differences in ranking on the measure of intelligence (odds ratio, 0.85; 95% CI, 0.61 to 1.19; $P = 0.339$). The sex of the anesthesiologist was not associated with differences in patient ranking of the actor anesthesiologists' intelligence (odds ratio, 1.24 for female *vs.* male; 95% CI, 0.98 to 1.58; $P = 0.076$). Patient participant sex and ethnicity were not associated with differences in patient ranking of actor anesthesiologist intelligence.

Care for Family Member

Female sex of the anesthesiologist was associated with higher patient ranking regarding which anesthesiologist they would prefer to care for their family member (table 3). We also noted a significant interaction between sex of the anesthesiologist and patient ethnicity. Among white participants, female actor anesthesiologists had greater odds of being ranked higher when patients were asked to rank their order of preference for which anesthesiologist they would choose to care for their family member (odds ratio, 1.80; 95% CI, 1.40 to 2.31; $P < 0.001$). This effect was not observed among nonwhite participants (odds ratio, 0.91 for female *vs.* male; 95% CI, 0.57 to 1.47; $P = 0.712$). Age of the anesthesiologist was not associated with differences in patient ranking of the anesthesiologist to care for their family member (odds ratio, 1.02 for older *vs.* younger; 95% CI, 0.80 to 1.30; $P = 0.885$). Patient participant sex and age were not associated with actor anesthesiologist ranking of which anesthesiologist they would prefer to care for their family member, and the interactions between patient and anesthesiologist age and sex were not statistically significant.

Leadership

Of the 300 participants, 33% (101 patients) chose the older male anesthesiologist, 26% (79 patients) chose the older female anesthesiologist, 21% (62 patients) chose the younger female anesthesiologist, and 19% (57 patients) chose the younger male anesthesiologist (table 4). We again observed a significant interaction between patient age and anesthesiologist age. Among the younger patients, older anesthesiologists had greater odds of being chosen as seeming like a leader when compared with younger anesthesiologists (odds ratio, 2.62; 95% CI, 1.72 to 4.00; $P < 0.001$; table 5). Among older patients, age of the anesthesiologist was not associated with a difference in patients' choice of the anesthesiologist who seemed most like a leader (odds ratio, 1.04; 95% CI, 0.66 to 1.64; $P = 0.863$). Sex of the anesthesiologist was not associated with a difference in patients' choice of the anesthesiologist who seemed most like a leader (odds ratio, 0.86 for female *vs.* male; 95% CI, 0.63 to 1.18; $P = 0.356$). Patient participant sex and ethnicity were not associated with differences in patients' choice of the anesthesiologist who seemed most like a leader.

Discussion

Our study demonstrates that patients have preferences for certain anesthesiologists. Younger patients (less than 65 yr old) perceived older anesthesiologists to be more confident, more intelligent, and more like a leader than younger anesthesiologists. Patients also ranked female anesthesiologists as more confident and were more likely to choose female anesthesiologists to care for their family member when compared with male anesthesiologists. These differences were observed while controlling for body language.

We previously demonstrated that patient perception is influenced by body language, with patients ranking actor anesthesiologists who display confident body language as more confident, more intelligent, and more like a leader, and preferentially choosing that anesthesiologist to care for their family member when compared with anesthesiologists displaying unconfident body language.[14] Body language is a modifiable factor, and anesthesiologists who have a tendency to display unconfident body language can potentially undergo training to adopt more confident body language in order to improve patient perceptions. In the current study, patients displayed clear preferences based on age and sex, despite controlling for the effects of body language. While the apparent age and sex of the anesthesiologist are characteristics that cannot be controlled, it is important to recognize that these conscious or unconscious patient preferences exist as they may affect patient perceptions and the patient–physician relationship. Future studies involving structured or semistructured patient interviews must be undertaken to identify which characteristics of being a female or older anesthesiologist are associated with higher ranking. Improved awareness of the reasons behind certain patient preferences may help anesthesiologists adopt certain tools and techniques (such as displaying high power, confident body language, or greater compassion or empathy) to improve their patients' perceptions of them. While anesthesiologist age and sex are not modifiable, we plan to investigate whether body language training or empathy training can improve one's perceptions by their patients and whether the training may be more helpful for male *versus* female, older *versus* younger anesthesiologists. Additionally, there is need to further understand how impactful these statistically significant differences are on patients' perioperative experiences and clinical outcomes, such as patient anxiety and postoperative pain.

One of the most interesting observations is that the patients' preferences for older-appearing and female anesthesiologists were not demonstrated consistently across all measures. For example, the sex of the anesthesiologist was not associated with a difference in patient ranking of the actor anesthesiologists' intelligence; however, female actor anesthesiologists had greater odds of being ranked higher when patients were asked to rank which actor anesthesiologist they would choose to care for their family member. By contrast, older actor anesthesiologists had greater odds of being ranked more intelligent than younger actor anesthesiologists, yet age of the anesthesiologist was not associated with a difference in patient ranking of choosing an anesthesiologist to care for their family member. This suggests that some unmeasured factor has a more powerful impact on choosing an anesthesiologist to care for a family member. For example, it is possible that the patients' assessment of an actor anesthesiologist's compassion, which was not measured in this study, may have a powerful impact on which actor anesthesiologist they would choose to care for their family member. Or perhaps the recent widely publicized data suggesting that treatment by female physicians may improve patient outcomes with lower readmission rates and mortality in elderly patients when compared with those cared for by male physicians[23] reached and influenced our patient population. Also, it is interesting to note that the higher ranking of older anesthesiologists on the measures of confidence, intelligence, and leadership was only observed among the younger patients (less than 65 yr old), and that we did not observe a preference for age of the anesthesiologist in patient ranking among older patients on these measures.

We attempted to control for many factors when recruiting and videotaping the actor anesthesiologists, including ethnicity, body language, and relative ages of the older/more experienced *versus* younger/less experienced actor anesthesiologists. However, there are likely unmeasured characteristics (*e.g.*, compassion) that may have contributed to the differences detected in patient perceptions of anesthesiologists. Additionally, no study can evaluate all interesting factors. For example, many of our coauthors are interested in racial disparities in perioperative medicine.[24] Race seems likely to influence patients' perceptions of anesthesiologist confidence, competence, likeability, *etc.* We look forward to evaluating this important question in a future trial optimally designed for investigating racial bias in patient perceptions of anesthesiologists.

Table 4. Results for Number and Proportion of Patients Who Selected Each Anesthesiologist as Seeming Most Like a Leader

	Leadership	
	No. of Responses (n = 300)	Percent of Total Responses (%)
Older male	101	34
Older female	79	26
Younger female	63	21
Younger male	57	19

Table 5. Odds Ratios with 95% CI for Age (Older *vs.* Younger Anesthesiologist) and Sex (Female *vs.* Male Anesthesiologist) for Patients Choosing the Single Anesthesiologist Who Seemed Most Like a Leader

Outcome Measure	Odds Ratio	95% Confidence Interval		*P* Value
		Lower	Upper	
Leadership				
Age (older), participants < 65 yr	2.62	1.72	4.00	< 0.001
Age (older), participants ≥ 65 yr	1.04	0.66	1.64	0.863
Sex (female), all participants	0.86	0.63	1.18	0.356

Regarding the interaction between participants' ethnicity and sex of the anesthesiologist, we observed that white participants significantly preferred female anesthesiologists when ranking confidence and likelihood of choosing the anesthesiologist to care for their family member. This preference for female sex of the anesthesiologist on these two measures was not observed among nonwhite participants. Because our study population involved many more white than nonwhite participants, it is possible that we did not have enough nonwhite participants to detect their preferences with significance. In fact, it should be noted that because our study involved a patient population that was predominantly white (and all patients recruited were English-speaking) evaluating white anesthesiologists, the results are not generalizable to regions or communities with more diverse populations. We plan to evaluate racial bias present in patient perceptions of anesthesiologists as mentioned above, and it would be very interesting and valuable to compare perceptions of patients with various racial and cultural backgrounds.

An additional limitation is that by instructing the actors to adopt the same confident posture, we do not know if the results would be similar for anesthesiologists adopting unconfident postures. Finally, the only patient demographics we collected were age, sex, and race. Presumably, variables such as baseline patient anxiety or depression and the type of surgery they are preparing for may influence patient perceptions. Without having collected this data, we do not know if these patient characteristics were equal between the two randomized patient groups.

In conclusion, patients have preferences for anesthesiologists that affect their perceptions of anesthesiologists' confidence, intelligence, and leadership abilities, and how likely they would be to choose a particular anesthesiologist to care for their family member. Older-appearing anesthesiologists were perceived as more confident and intelligent and more like a leader, while female anesthesiologists were perceived as more confident and were more likely to be chosen by patients to care for their family member. Elucidating the roles anesthesiologists' age, sex, and other factors play in influencing patient preferences through conscious or unconscious biases is the first step in developing strategies to strengthen the physician–patient relationship and ultimately attempt to use this information to improve patients' perioperative experiences and outcomes.

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Competing Interests

The authors declare no competing interests.

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Appendix: Physician Perception Study Questionnaire

Rank each anesthesiologist in order of how likely you would be to choose the anesthesiologist to care for your family member:

— (Most Likely)
—
—
— (Least Likely)

Rank each anesthesiologist in order of *confidence*:

— (Most Confident)
—
—
— (Least Confident)

Rank each anesthesiologist in order of *intelligence*:

— (Most Intelligent)
—
—
— (Least Intelligent)

Which of these four anesthesiologists seemed most like a *leader*? (single answer)

Anesthesiologist #: —