

Review Article

Evaluating Factors Influencing Patient Reviews: Variations in Professional Credentials and Demographics of Orthopedic Oncologists

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Background

Orthopedic oncology depends on strong patient-provider relationships and advanced expertise. Patients in this specialized and nuanced field rely on online platforms, such as U.S. News & World Report (USNWR), to guide their decision-making. While these platforms provide insights into patient satisfaction, they may fail to capture critical nuances such as academic background, research focus, and training recency. This study aims to evaluate the influence of U.S. News physician ratings on patient perceptions of orthopedic oncologists and their correlation with professional credentials.

Methods

This retrospective analysis identified 312 fellowship-trained active American orthopedic oncologists through ACGME-accredited orthopedic surgery residency programs and the

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Musculoskeletal Tumor Society. Ratings of 228 physicians were obtained from USNWR using Press Ganey analytics and normalized with calculated Bayesian (weighted) averages. Statistical analyses used Mann-Whitney U tests for two-group comparisons and Kruskal-Wallis tests for comparisons with >2 groups. When Kruskal-Wallis tests were significant, post-hoc pairwise Mann-Whitney U tests with Holm adjustment were performed.

Results

Non-academic physicians received significantly higher overall patient satisfaction scores than their academically appointed counterparts. Notably, physicians with PhDs had significantly lower ratings in categories such as follow-up care, time spent with patients, attitude, inclusion in decision-making, and overall feedback. Recent residency graduates (2011-2020) demonstrated significantly higher ratings in clarity of instructions, provider follow-up, and provider attitude compared to earlier cohorts ($P < 0.05$).

Conclusion

Patients appear to prioritize factors including accessibility and communication, favoring non-academic physicians and recently trained providers. Lower patient experience scores observed among PhD-trained physicians may reflect differences in practice structure, patient expectations, or unmeasured confounding, although this warrants further study. Limitations include incomplete and variable review data. Though U.S. News ratings provide valuable insights, they may not fully reflect the multifaceted nature of quality care in orthopedic oncology. A more comprehensive model, incorporating clinical outcomes, peer assessments, and patient-reported experiences, is essential to understanding and improving patient satisfaction with clinician practice and characteristics.

BACKGROUND

Patient satisfaction has emerged as a key measure of healthcare quality over recent decades. The widespread use of satisfaction surveys, including Press Ganey questionnaires, allows hospitals and clinics to evaluate and subsequently improve patient experiences (Stephens et al. 2020). Recent incentives also link patient experience metrics directly to provider reimbursement (Manary et al. 2013). Furthermore, online physician rating platforms are increasingly influencing patient decisions, with nearly a third of adults using these reviews to select physicians (Hanauer et al. 2014). U.S. News & World Report (USNWR) has incorporated Press Ganey-derived ratings since 2018, with sub-scores on communication, clarity, follow-up, and physician demeanor (Knowles 2018). However, these ratings may not fully represent the complexities of physician qualifications or practice environments.

Orthopedic oncology is a surgical subspecialty that treats complex musculoskeletal tumors, demanding consistent patient communication due to the multidisciplinary nature of treatment. While orthopedic surgery overall has historically exhibited low female representation, orthopedic oncology has demonstrated comparatively greater female representation and leadership within this subspecialty (Peterman et al. 2022; Fram et al. 2023). Surgeon professional characteristics also vary widely, ranging from academically affiliated surgeons involved in research and teaching to community-based clinicians primarily focused on clinical care; some orthopedic oncologists pursue advanced degrees (e.g., PhD) to further research expertise. Accordingly, orthopedic oncology provides an informative

context to examine whether physician and practice characteristics correlate with publicly reported patient experience ratings, as such professional differences may influence both care delivery and patient perception.

Several factors influence patient satisfaction in orthopedics, including non-modifiable patient characteristics such as age, sex, education level, and travel distance (Stephens et al. 2020; Rane et al. 2019). Older patients generally report higher rates of satisfaction, while increased travel distances and psychosocial stressors are associated with lower satisfaction (Cushman et al. 2025; Rane et al. 2019). Additionally, biases concerning physician demographics exist; outpatient orthopedic studies suggest that female and Asian surgeons may receive lower satisfaction ratings, reflecting patient biases despite generally more patient-centered communication styles (Lu et al. 2021). Conversely, broader primary care studies indicate that female physicians often achieve equal or greater satisfaction scores, highlighting the variability across fields and subspecialties (Hall and Roter 1994). Physician age and experience similarly influence satisfaction, with older physicians benefiting from perceptions of expertise. In contrast, younger physicians, who are trained in patient-centered communication, increasingly achieve improved patient interactions (Derose et al. 2001; Cushman et al. 2025).

Substantial research has not been conducted to demonstrate how a physician's academic versus non-academic practice setting and advanced research credentials impact patient satisfaction. Academic physicians balance clinical responsibilities with research and teaching, which may affect their patient availability, appointment duration, and communication style, compared to non-academic clinicians

who focus solely on patient care. Patients may perceive academic physicians as innovative, yet less accessible or personable. Prior surveying indicates that patients prefer private practice settings due to perceptions of greater personalization and trust, contrasting with views of academic centers as less personal or convenient (Shryock 2023). However, comparative satisfaction data between academic and non-academic physicians are limited and inconsistent; some reports favor academic settings for resources and coordination, whereas others highlight higher patient loyalty and trust in private practices (Stephens et al. 2020; Shryock 2023). Investigating such dynamics within orthopedic oncology may clarify how academic affiliation and advanced degrees impact patient satisfaction, as opposed to the flexibility provided to patients in non-academic environments.

This study examines the relationships between patient satisfaction ratings among orthopedic oncologists, further stratified by surgeon characteristics. Using USNWR physician ratings derived from Press Ganey surveys, the analysis explores whether specific credentials or demographics correlate with patient satisfaction outcomes. It is hypothesized that academic involvement (PhD degrees or academic ranks) may be associated with lower satisfaction in domains like communication and patient time, whereas private practice and recent training might improve patient experiences through patient-centered care approaches.

METHODS

Study Design and Cohort Identification: A retrospective observational study of orthopedic oncologists in the United States was conducted in May 2025. To assemble the cohort, currently active orthopedic surgeons who had completed fellowship training in musculoskeletal oncology were identified through ACGME-accredited (Accreditation Council for Graduate Medical Education) orthopedic surgery residency programs and the Musculoskeletal Tumor Society's membership directory. Faculty lists on publicly available department and university websites were cross-referenced to find individuals with titles or subspecialty descriptions indicating orthopedic oncology specialization. The initial cohort comprised 312 fellowship-trained orthopedic oncology surgeons. Basic demographics of this cohort (sex, degrees, academic ranks, and residency start years) are summarized in [Table 1](#).

Ethics: This study used publicly available, non-identifiable data. As such, it did not require IRB approval as per institutional policy.

Patient Satisfaction Data Collection: For each identified physician, patient satisfaction metrics were obtained from USNWR online physician profiles. Since 2018, USNWR has published patient experience ratings on many doctor profiles via a partnership with Press Ganey. The ratings include an overall satisfaction score (on a 1 to 5 scale, with 5 indicating excellent) and up to ten specific domain scores covering different aspects of patient experience including: thoroughness of examination, ability to answer questions, clarity of instructions, provider's follow-up (e.g. in arranging care or responding to patient needs), amount

of time the provider spent with the patient, provider's attitude (courtesy/respect), perceived outcomes of care, patient loyalty (likelihood to recommend the provider), inclusion in treatment decision-making, and overall general feedback. Of the 312 surgeons, 228 (73.1%) had publicly available patient satisfaction data on USNWR.

Outcome Measures and Statistical Analysis: Primary outcome measures were the physician's patient satisfaction scores in each domain (overall rating and the ten specific categories mentioned above). Outcomes were bounded (1–5) ratings; we summarized them using mean±SD and median (IQR), and used nonparametric tests for group comparisons. The primary grouping variables (independent factors) were physician sex (male vs. female), medical degree (MD vs. DO), PhD attainment (yes or no), academic rank (categorized as Full professor, Associate Professor, Assistant Professor, or Other for private practice physicians), and career duration as proxied by residency start year (before 1980, 1981–1990, 1991–2000, 2001–2010, and 2011–2020).

To reduce instability from physicians with few reviews, we computed a weighted (“Bayesian”) average for each outcome domain using the standard formulation used in online rating systems. Because physician reviews are bounded (1–5) and typically right-skewed, outcomes are summarized using mean±SD and median (IQR). Group differences were evaluated using two-sided nonparametric tests: Mann-Whitney U tests for comparisons between two groups (e.g., sex, degree type, PhD attainment) and Kruskal-Wallis tests for comparisons across >2 categories (e.g., academic rank, residency start-year cohort). When Kruskal-Wallis tests indicated an overall difference, we performed post-hoc pairwise Mann-Whitney U tests with Holm adjustment for multiple comparisons. A significance threshold of $P < 0.05$ was used. Sample sizes (n) reflect surgeons with non-missing Bayesian-average values for each domain.

The standard Bayesian-average formula was used:

$$W = \frac{vR + mC}{v + m}$$

where W is the Bayesian-adjusted rating, R is the physician's observed mean rating for that domain, v is the physician's number of reviews contributing to that domain, C is the overall mean rating across all physicians for that domain, and m is the minimum review-count threshold (a smoothing constant, $m=10$) that determines the strength of shrinkage toward the overall mean.

RESULTS

[Table 1](#) shows the majority of identified orthopedic oncologists were male (79%) and held MD degrees (97%). Only 5.8% had attained a PhD. Academic ranks were well represented across full, associate, and assistant professor levels (~23–26% each), with about one-quarter of the cohort not holding faculty titles (private practice or other). Nearly 23% of the surgeons were recent residency graduates (2011–2020), while 37% started training in the early 2000s; a smaller fraction began practice in earlier decades.

Table 1. Orthopedic Oncologist Demographics.

Category	Value	Count	Percentage (%)
Overall	Total	312	100
Sex	M	248	79.49
	F	64	20.51
PhD	Y	18	5.77
	N	294	94.23
Degree	MD	304	97.44
	DO	8	2.56
Academic Ranking	Full Professor	72	23.08
	Associate Professor	79	25.32
	Assistant Professor	80	25.64
	Other	81	25.96
Residency Start Year	≤1980	12	3.85
	1981-1990	42	13.46
	1991-2000	71	22.76
	2001-2010	114	36.54
	2011-2020	73	23.4

Demographic and professional characteristics of orthopedic oncologists included in the analytic cohort (N=312). Values are presented as a count (percentage).

Table 2. Patient Experience Domains by Surgeon Sex.

Outcome	Male	Female	P
Overall satisfaction	4.66±0.47; 4.92 (4.24-4.96); n=184	4.68±0.34; 4.83 (4.38-4.94); n=44	0.208
Thoroughness of examination	4.56±0.69; 4.90 (4.71-4.95); n=170	4.51±0.66; 4.84 (4.14-4.95); n=40	0.218
Ability to answer questions	4.32±0.89; 4.84 (4.02-4.92); n=149	4.24±0.88; 4.69 (3.46-4.88); n=34	0.227
Clarity of instructions	4.53±0.77; 4.91 (4.75-4.95); n=158	4.46±0.75; 4.86 (4.53-4.91); n=36	0.069
Provider follow-up	4.04±0.87; 4.04 (3.20-4.84); n=165	4.30±0.76; 4.58 (4.02-4.80); n=39	0.446
Time spent with patient	4.16±0.86; 4.65 (3.41-4.87); n=176	4.24±0.76; 4.57 (4.02-4.78); n=40	0.485
Provider attitude	4.06±0.84; 4.02 (3.31-4.84); n=179	4.00±0.76; 4.03 (3.26-4.62); n=42	0.396
Perceived outcomes	3.95±0.83; 4.00 (3.16-4.78); n=181	3.93±0.88; 4.32 (3.12-4.64); n=42	0.713
Patient loyalty	4.09±0.88; 4.46 (3.24-4.85); n=184	4.18±0.76; 4.49 (3.81-4.78); n=42	0.914
Inclusion in decisions	4.46±0.97; 4.96 (4.83-4.98); n=65	4.74±0.51; 4.96 (4.82-4.97); n=15	0.824
General feedback	4.32±0.80; 4.77 (4.02-4.90); n=180	4.39±0.68; 4.68 (4.04-4.85); n=43	0.401

Each group summary cell reports mean±SD; median (IQR); n = surgeons with non-missing Bayesian average for that domain. P-values are nonparametric (Mann-Whitney U for 2 groups).

[Table 2](#) summarizes Bayesian-adjusted patient experience scores stratified by surgeon sex. Overall satisfaction and all 10 domain ratings were similar between male and female orthopedic oncologists, with no statistically significant differences observed across domains (all $P>0.05$). Median scores were uniformly high in both groups (generally ≥ 4.0 across domains), and the closest trend was noted for clarity of instructions ($P=0.069$), though this did not reach statistical significance.

[Table 3](#) compares patient experience scores by PhD attainment. Surgeons with PhDs demonstrated lower overall satisfaction compared with non-PhD surgeons (median 4.19 vs 4.91; $P=0.010$). PhD status was also associated with significantly lower ratings in several communication- and

relationship-oriented domains, including provider follow-up ($P=0.049$), time spent with patient ($P=0.026$), provider attitude ($P=0.049$), inclusion in decisions ($P<0.001$), and general feedback ($P=0.019$). Differences were not significant for thoroughness of examination, ability to answer questions, clarity of instructions, perceived outcomes, or patient loyalty (all $P>0.05$). Notably, the PhD subgroup had smaller non-missing sample sizes across domains ($n=9-12$), supporting interpretation of these findings as exploratory.

[Table 4](#) presents Bayesian-adjusted patient experience scores by medical degree (MD vs DO). Across overall satisfaction and all domain ratings, there were no statistically significant differences between MD and DO surgeons (all $P>0.05$). Ratings were high in both groups; however, the

Table 3. Patient Experience Domains by PhD Status.

Outcome	PhD	No PhD	P
Overall satisfaction	4.40±0.49; 4.19 (4.11-4.91); n=12	4.68±0.44; 4.91 (4.31-4.96); n=216	0.010
Thoroughness of examination	4.36±0.69; 4.84 (4.11-4.89); n=11	4.56±0.68; 4.90 (4.71-4.95); n=199	0.090
Ability to answer questions	3.83±1.17; 4.39 (2.56-4.83); n=10	4.33±0.87; 4.83 (4.02-4.92); n=173	0.078
Clarity of instructions	4.72±0.54; 4.88 (4.87-4.91); n=10	4.50±0.77; 4.90 (4.71-4.95); n=184	0.744
Provider follow-up	3.52±1.03; 3.27 (2.72-4.78); n=12	4.13±0.83; 4.56 (3.25-4.83); n=192	0.049
Time spent with patient	3.57±0.89; 3.73 (3.07-4.05); n=12	4.21±0.83; 4.65 (3.61-4.86); n=204	0.026
Provider attitude	3.54±0.93; 3.28 (2.99-4.20); n=12	4.08±0.81; 4.02 (3.31-4.83); n=209	0.049
Perceived outcomes	3.75±0.76; 3.99 (3.27-3.99); n=12	3.96±0.84; 4.00 (3.14-4.77); n=211	0.206
Patient loyalty	3.68±1.01; 4.01 (2.55-4.68); n=12	4.13±0.84; 4.49 (3.32-4.86); n=214	0.070
Inclusion in decisions	2.87±0.77; 2.57 (2.53-2.80); n=9	4.72±0.68; 4.96 (4.90-4.98); n=71	<0.001
General feedback	3.68±1.07; 3.32 (2.76-4.84); n=12	4.37±0.75; 4.77 (4.03-4.90); n=211	0.019

Each group summary cell reports mean±SD; median (IQR); n = surgeons with non-missing Bayesian average for that domain. P-values are nonparametric

Table 4. Patient Experience Domains by Degree.

Outcome	MD	DO	P
Overall satisfaction	4.66±0.45; 4.91 (4.25-4.96); n=223	4.68±0.48; 4.84 (4.81-4.96); n=5	0.875
Thoroughness of Examination	4.54±0.68; 4.89 (4.16-4.95); n=206	4.86±0.11; 4.87 (4.78-4.95); n=4	0.627
Ability to Answer Questions	4.29±0.89; 4.82 (4.02-4.91); n=179	4.81±0.15; 4.81 (4.69-4.93); n=4	0.457
Clarity of Instructions	4.51±0.77; 4.90 (4.71-4.94); n=190	4.85±0.12; 4.85 (4.75-4.95); n=4	0.77
Provider's follow-up	4.09±0.85; 4.51 (3.24-4.83); n=200	4.38±0.89; 4.75 (4.22-4.91); n=4	0.383
Amount of Time with Patient	4.17±0.84; 4.62 (3.43-4.85); n=212	4.40±0.88; 4.77 (4.25-4.91); n=4	0.462
Provider's Attitude	4.05±0.83; 4.02 (3.28-4.82); n=217	4.21±0.81; 4.21 (3.52-4.90); n=4	0.49
Perceived Outcomes	3.94±0.84; 4.00 (3.14-4.76); n=218	4.13±0.88; 4.42 (3.43-4.87); n=5	0.54
Patient Loyalty	4.10±0.86; 4.44 (3.26-4.84); n=221	4.40±0.77; 4.59 (4.50-4.89); n=5	0.489
Inclusion in Decisions	4.50±0.92; 4.95 (4.82-4.98); n=78	4.97±0.01; 4.97 (4.97-4.98); n=2	0.414
General Feedback	4.33±0.78; 4.76 (4.03-4.90); n=218	4.47±0.75; 4.69 (4.62-4.92); n=5	0.736

Each group summary cell reports mean±SD; median (IQR); n = surgeons with non-missing Bayesian average for that domain. P-values are nonparametric (Mann-Whitney U).

DO subgroup had very small non-missing counts across domains (typically n=2-5), limiting precision and supporting cautious interpretation of equivalence.

[Table 5](#) evaluates patient experience ratings across academic rank categories (Assistant Professor, Associate Professor, Full Professor, and Other). Significant overall differences were observed for overall satisfaction ($P<0.001$), thoroughness of examination ($P=0.030$), clarity of instructions ($P=0.019$), and inclusion in decisions ($P=0.011$). Post-hoc Holm-adjusted comparisons indicated that the “Other” group generally rated higher than academic ranks for overall satisfaction (Other > Assistant, Associate, and Full Professor) and showed higher scores than Associate Professors for thoroughness, clarity, and inclusion in decisions; “Other” also exceeded Full Professors for clarity. Most remaining domains (ability to answer questions, provider follow-up, time spent, provider attitude, patient loyalty, and general feedback) did not differ significantly by rank (all $P>0.05$).

[Table 6](#) compares patient experience scores across residency start-year cohorts. Overall differences by cohort were

identified for clarity of instructions ($P=0.044$), provider follow-up ($P=0.027$), and provider attitude ($P=0.006$). Holm-adjusted post-hoc comparisons demonstrated higher scores in later cohorts for selected domains, including differences between 1981-1990 vs 2011-2020 for clarity of instructions and provider follow-up, as well as higher provider attitude in the 2001-2010 cohort compared with 1981-1990. No significant cohort differences were observed for overall satisfaction, thoroughness of examination, ability to answer questions, time spent with patient, perceived outcomes, patient loyalty, inclusion in decisions, or general feedback (all $P>0.05$).

DISCUSSION

This study investigated the impact of physician characteristics on patient satisfaction among orthopedic oncology surgeons in the United States. Patient satisfaction in this subspecialty was generally very high; however, significant differences emerged based on academic involvement, research credentials, and generational cohort. Physicians in

Table 5. Patient Experience Domains by Academic Rank.

Outcome	Assistant	Associate	Full Professor	Other	P	Post-hoc (Holm)
Overall satisfaction	4.69±0.40; 4.89 (4.41-4.95); n=42	4.55±0.53; 4.83 (4.18-4.94); n=68	4.65±0.45; 4.91 (4.22-4.95); n=69	4.82±0.31; 4.96 (4.88-4.98); n=49	<0.001	Other > Assistant (P _{new} =0.021); Other > Associate (P _{new} <0.001); Other > Full (P _{new} =0.001)
Thoroughness of examination	4.69±0.51; 4.91 (4.75-4.94); n=40	4.47±0.75; 4.85 (4.13-4.92); n=62	4.51±0.69; 4.89 (4.11-4.93); n=61	4.59±0.70; 4.93 (4.77-4.97); n=47	0.03	Other > Associate (P _{new} =0.044)
Ability to answer questions	4.49±0.71; 4.80 (4.58-4.91); n=37	4.03±1.04; 4.69 (3.14-4.88); n=53	4.38±0.88; 4.85 (4.05-4.91); n=50	4.40±0.77; 4.87 (4.03-4.95); n=43	0.068	--
Clarity of instructions	4.62±0.57; 4.88 (4.73-4.94); n=38	4.46±0.79; 4.87 (4.09-4.94); n=53	4.41±0.89; 4.89 (4.20-4.93); n=61	4.64±0.68; 4.93 (4.85-4.97); n=42	0.019	Other > Associate (P _{new} =0.033); Other > Full (P _{new} =0.022)
Provider follow-up	3.98±0.95; 4.45 (3.12-4.81); n=35	3.96±0.93; 4.48 (3.13-4.75); n=61	4.18±0.81; 4.68 (3.37-4.83); n=67	4.24±0.67; 4.02 (4.00-4.85); n=41	0.325	--
Time spent with patient	4.18±0.90; 4.62 (4.01-4.86); n=37	4.10±0.87; 4.62 (3.31-4.81); n=66	4.17±0.87; 4.63 (3.43-4.84); n=68	4.28±0.73; 4.65 (4.01-4.92); n=45	0.54	--
Provider attitude	4.18±0.66; 4.37 (3.53-4.84); n=41	4.00±0.82; 4.02 (3.32-4.72); n=66	3.97±0.91; 4.01 (3.25-4.79); n=69	4.13±0.84; 4.59 (3.13-4.89); n=45	0.536	--
Perceived outcomes	3.93±0.79; 4.00 (3.13-4.64); n=41	3.75±0.88; 3.98 (3.10-4.63); n=67	4.14±0.81; 4.42 (3.98-4.81); n=68	3.98±0.81; 4.00 (3.10-4.80); n=47	0.075	--
Patient loyalty	4.15±0.73; 4.07 (4.01-4.77); n=41	4.09±0.86; 4.47 (3.34-4.81); n=67	4.01±0.96; 4.50 (3.15-4.83); n=69	4.22±0.80; 4.50 (4.00-4.92); n=49	0.56	--
Inclusion in decisions	4.76±0.58; 4.92 (4.82-4.97); n=14	4.17±1.16; 4.94 (2.79-4.97); n=24	4.39±1.03; 4.95 (4.81-4.97); n=17	4.79±0.53; 4.98 (4.95-4.99); n=25	0.011	Other > Associate (P _{new} =0.022)
General feedback	4.45±0.65; 4.75 (4.07-4.90); n=42	4.19±0.86; 4.68 (3.71-4.85); n=67	4.31±0.82; 4.78 (3.87-4.88); n=68	4.47±0.68; 4.87 (4.02-4.94); n=46	0.068	--

Each group summary cell reports mean±SD; median (IQR); n = surgeons with non-missing Bayesian average for that domain. P-values are nonparametric (Mann-Whitney U for 2 groups; Kruskal-Wallis for >2 groups). When Kruskal-Wallis was significant, post-hoc pairwise Mann-Whitney tests used Holm adjustment.

non-academic settings typically received higher overall satisfaction scores than their academic counterparts (Table 5). Patients often value the personalized attention and accessibility that smaller, independent practices offer. According to Shryock(Shryock 2023), 78% of patients prefer independent practices due to the more personal relationships they offer, and 60% express greater trust in independent physicians.

Academic Ranking: While academic surgeons frequently handle complex cases and multiple responsibilities, this may negatively impact patient perception due to limited availability, busier schedules, and reduced direct patient interaction. In teaching environments, however, patient experience may be shaped by team-based care. Residents and fellows often conduct initial evaluations, routine follow-ups, and peri-visit communication, with attendings providing supervision and key decision-making but potentially less direct contact time. Therefore, lower ratings associated with academic practice may partially reflect patient experiences with the broader care team and clinic workflows rather than the attending surgeon alone,

even though USNWR displays these ratings at the attending-physician level. Patient complexity and acuity may also significantly differ in such settings. Previous studies present mixed findings regarding patient satisfaction between academic and non-academic settings, with some research indicating comparable or better performance by academic hospitals, while others highlight greater loyalty and trust in private practices (Stephens et al. 2020; Shryock 2023). These findings suggest that academic institutions could benefit from adopting patient-centric practices prevalent in private clinics, such as improved scheduling and continuity of care (Rane et al. 2019).

PhD status: PhDs were associated with lower Bayesian-adjusted patient experience scores in several domains. However, because the PhD subgroup was small across domains and this study uses cross-sectional, publicly reported patient experience data, these findings should be interpreted as exploratory and hypothesis-generating rather than definitive evidence of a causal relationship. Multiple unmeasured factors may contribute, including differences in practice environment (e.g., academic responsibilities),

Table 6. Patient Experience Domains by Residency Cohort.

Outcome	≤1980	1981-1990	1991-2000	2001-2010	2011-2020	P	Post-hoc (Holm)
Overall satisfaction	4.59±0.65; 4.94 (4.65-4.96); n=12	4.62±0.49; 4.91 (4.15-4.96); n=40	4.64±0.52; 4.92 (4.22-4.97); n=62	4.70±0.37; 4.90 (4.35-4.96); n=95	4.71±0.32; 4.86 (4.60-4.93); n=19	0.86	--
Thoroughness of examination	4.51±0.78; 4.92 (4.62-4.94); n=12	4.41±0.66; 4.84 (4.06-4.92); n=38	4.46±0.81; 4.90 (4.12-4.96); n=55	4.63±0.62; 4.90 (4.74-4.95); n=86	4.71±0.47; 4.88 (4.76-4.94); n=19	0.377	--
Ability to answer questions	4.34±0.59; 4.39 (4.02-4.86); n=10	4.19±0.97; 4.84 (3.14-4.91); n=31	4.39±0.89; 4.86 (4.04-4.94); n=50	4.28±0.90; 4.77 (4.02-4.91); n=75	4.35±0.86; 4.73 (4.60-4.91); n=17	0.542	--
Clarity of instructions	4.21±1.11; 4.91 (3.14-4.94); n=9	4.26±0.93; 4.88 (3.89-4.92); n=36	4.52±0.75; 4.90 (4.47-4.95); n=51	4.67±0.61; 4.91 (4.82-4.95); n=79	4.48±0.74; 4.81 (4.72-4.90); n=19	0.044	1981-1990 vs 2011-2020 (P_{new} = 0.048)
Provider follow-up	3.79±1.00; 3.68 (3.06-4.84); n=12	3.85±0.80; 3.70 (3.18-4.73); n=36	3.94±0.90; 4.01 (3.14-4.82); n=57	4.25±0.81; 4.65 (4.01-4.85); n=86	4.63±0.46; 4.76 (4.58-4.89); n=13	0.027	1981-1990 vs 2011-2020 (P_{new} = 0.036)
Time spent with patient	3.83±1.21; 4.35 (2.54-4.85); n=12	4.03±0.86; 4.05 (3.16-4.83); n=38	4.03±0.85; 4.04 (3.34-4.83); n=60	4.33±0.76; 4.72 (4.01-4.87); n=91	4.45±0.76; 4.73 (4.60-4.86); n=15	0.116	--
Provider attitude	4.16±0.92; 4.67 (3.78-4.83); n=12	3.66±0.97; 3.79 (3.04-4.67); n=38	3.92±0.86; 4.00 (3.19-4.79); n=62	4.26±0.69; 4.44 (4.01-4.87); n=91	4.19±0.61; 4.22 (4.01-4.68); n=18	0.006	2001-2010 > 1981-1990 (P_{new}=0.009)
Perceived outcomes	4.19±1.00; 4.74 (3.78-4.84); n=12	3.73±0.87; 3.98 (3.10-4.60); n=39	3.95±0.82; 4.00 (3.24-4.77); n=61	3.97±0.81; 3.99 (3.13-4.72); n=92	4.12±0.84; 4.50 (3.19-4.72); n=19	0.287	--
Patient loyalty	4.00±1.00; 4.34 (3.11-4.84); n=12	3.93±1.02; 4.19 (3.06-4.84); n=40	3.96±0.87; 4.02 (3.12-4.80); n=62	4.27±0.76; 4.61 (4.01-4.88); n=93	4.20±0.70; 4.47 (4.01-4.74); n=19	0.228	--
Inclusion in decisions	4.07±1.28; 4.51 (3.62-4.95); n=4	4.09±1.28; 4.94 (2.51-4.97); n=12	4.65±0.77; 4.97 (4.93-4.98); n=21	4.55±0.88; 4.96 (4.85-4.98); n=33	4.82±0.35; 4.93 (4.88-4.96); n=10	0.47	--
General feedback	4.24±1.01; 4.83 (3.78-4.90); n=12	4.11±0.76; 4.07 (3.31-4.85); n=39	4.28±0.84; 4.76 (4.00-4.91); n=61	4.46±0.73; 4.80 (4.12-4.92); n=92	4.44±0.62; 4.68 (4.31-4.82); n=19	0.12	--

Each group summary cell reports mean±SD; median (IQR); n = surgeons with non-missing Bayesian average for that domain. P-values are nonparametric (Mann-Whitney U for 2 groups; Kruskal-Wallis for >2 groups). When Kruskal-Wallis was significant, post-hoc pairwise Mann-Whitney tests used Holm adjustment.

team-based care structure, case complexity, and patient expectations. Future work using encounter-level measures and adjustment for patient- and practice-level confounders is needed to clarify whether these associations persist and to identify modifiable drivers of patient experience among surgeon-scientists.

Career Longevity: Generational differences also influenced patient satisfaction, with younger, recently trained surgeons (those trained in the last 10-15 years) receiving notably higher ratings in areas such as follow-up and patient interaction compared to those trained earlier. Recent training emphasizes patient-centered care and effective communication, contributing to improved interactions (Cushman et al. 2025). Conversely, mid-career surgeons trained in the late 20th century had lower ratings, potentially reflecting historical differences in training approaches (Derose et al. 2001).

Sex-Based Differences: Gender did not significantly influence patient satisfaction, indicating equity in patient perceptions of male and female orthopedic oncologists. Despite historical gender imbalances in orthopedics, female surgeons in this subspecialty performed equally well across all satisfaction categories, countering prior mixed findings from other orthopedic studies (Lu et al. 2021). This is reassuring and can be influenced by patients prioritizing expertise, multidisciplinary coordination, and high-stakes decision-making over demographic stereotypes.

Degree differences: No differences were observed between DO and MD surgeons, although the DO sample was small. Patients rated DOs equivalently, aligning with broader findings of comparable care quality between osteopathic and allopathic physicians (Licciardone 2007).

Limitations: The study has limitations, including potential response bias inherent in Press Ganey surveys. Press

Ganey attempts to survey all patients (often via email shortly after the visit), which improves response rates compared to purely voluntary online reviews (Blank et al. 2020). There was also a lack of control over patient demographics and case complexity, as well as the cross-sectional design. The generalizability may also be limited to orthopedic oncology due to its unique patient population and clinical challenges (Shryock 2023). Additionally, academic vs non-academic differences may be confounded by team-based care structures typical of teaching institutions, representing an important limitation when interpreting physician-level ratings in academic settings. Furthermore, we could not adjust for diagnosis- or treatment-level case complexity (e.g., referral severity, limb-salvage complexity), which may confound differences in patient experience ratings between academic and non-academic practice settings.

Clinically, these findings suggest that academic centers may benefit from investing in patient-centered practices, providing targeted training for physician-scientists, and continuing to emphasize communication skills in medical education. Ensuring equitable evaluation metrics and recognizing the multifaceted nature of patient satisfaction is critical. Future research should explore targeted interventions to enhance patient interactions, conduct longitudinal analyses to examine generational effects (especially as these surgeons age), and investigate the impact of multidisciplinary teams on patient satisfaction. It is essential to discuss the role and suitability of patient satisfaction in evaluating physician performance and compensation, as patient satisfaction is not a perfect proxy for clinical quality (Manary et al. 2013; Fenton et al. 2012). Patient satisfaction should be one of multiple metrics, balanced with quality outcomes, when evaluating performance. Overall, enhancing physician communication and patient-centric care practices will benefit patient satisfaction, therapeutic alliances, and potentially clinical outcomes (Manary et al. 2013).

CONCLUSION

Patient experiences in orthopedic oncology are overwhelmingly positive, with most surgeons achieving satisfaction scores that exceed national benchmarks at ≥ 4.0 across domains (DeLoughery 2019). Nonetheless, meaningful differences persist: non-academic surgeons receive higher overall ratings; male and female surgeons, and MD and DO physicians, perform equivalently; PhD-holding surgeon-scientists score lower in communication and shared-decision domains; and recently trained surgeons outshine mid-career colleagues, reflecting modern emphases on patient-centered care, although the small sample sizes warrant future study. These findings suggest that academic centers and research-intensive faculty should reinforce patient-facing availability, timely follow-up, and collaborative communication so that scholarly commitments do not erode the patient experience. Targeted mentorship, improved scheduling, and deliberate communication coaching can help close the remaining gaps while preserving the high satisfaction that already characterizes orthopedic oncology.

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