

General

Public Attitudes Towards Regenerative Orthopedic Therapy

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Objective

To assess awareness, self-rated knowledge, treatment perceptions, and perceived barriers concerning regenerative orthopedic therapies.

Methods

An anonymous, opt-in, cross-sectional online survey of 100 US adults was analyzed using unweighted descriptive statistics.

Results

Mean age was 63.5 years; 64% were female. Sixty percent reported prior awareness, while 77% rated their knowledge as little or none. Stem cell therapy was recognized by 84% and platelet-rich plasma by 30%. Physicians were the primary medical information source for 71%; 63% would consider physician-recommended treatment. Seventy-seven percent would pay nothing or less than \$500 per session. Perceived barriers included cost (72%), lack of insurance coverage (62%), and doubts about effectiveness (59%).

Conclusion

Respondents reported low self-rated knowledge, uncertainty about treatment evidence and safety, and financial barriers. Findings support clear, balanced patient communication but are limited by self-selection and the sample's demographic composition.

INTRODUCTION

Regenerative orthopedic therapies encompass a heterogeneous group of interventions, including platelet-rich plasma (PRP), bone marrow aspirate concentrate, and cell-based products. These approaches have attracted interest for osteoarthritis and tendinopathy, although the evidence varies by intervention, preparation, and indication. Systematic reviews of PRP illustrate the importance of evaluating specific clinical applications rather than assuming that all regenerative treatments have equivalent effects.¹⁻³

The commercial availability of these interventions creates challenges for patient education. Reports concerning US stem cell clinics and direct-to-consumer advertising have identified concerns about patient safety, unsupported claims, and marketing of unproven interventions.⁴⁻⁶ Recognition of a treatment name does not necessarily indicate familiarity with its evidence, limitations, or suitability for an individual patient.

Research on patients seeking stem cell therapy has examined their motivations and the implications for counseling.⁷ Physicians also have an important role in helping patients evaluate unproven treatments.⁸ Understanding public perceptions may help clinicians anticipate questions

about effectiveness, safety, physician recommendations, and out-of-pocket payment. This study assessed these domains in an anonymous, opt-in survey of 100 US adults.

METHODS

STUDY DESIGN AND PARTICIPANTS

This cross-sectional study used an anonymous, web-based survey of US adults. Participation was voluntary and opt-in. Respondents were recruited through an online survey platform using Random Device Engagement methodology. The analyzed dataset contained 100 completed responses. Recruitment across US regions did not constitute probability sampling, and the sample was not assumed to represent the US adult population. The study was granted an exemption from institutional review board review.

SURVEY INSTRUMENT AND DATA SOURCES

The questionnaire contained 14 items covering awareness of regenerative orthopedic therapies, self-rated knowledge, perceptions of evidence and safety, perceived exaggeration of benefits by clinics, willingness to consider physician-

recommended treatment, payment and travel preferences, willingness to recommend treatment, insurance coverage preferences, perceived barriers, and primary sources of medical information. The final item allowed an open-ended response. The questionnaire is reproduced in Appendix 1.

Items used single-response options, multiple-response options, and five-point self-rating scales. Knowledge was self-assessed rather than measured with an objective test. The questionnaire was not treated as a validated measure of knowledge or health literacy. Demographic characteristics and musculoskeletal history were obtained from the platform profile fields included in the export. These health-history selections were not clinically verified. Race and ethnicity were summarized using the export's combined "Ethnicity (Simplified)" variable.

STATISTICAL ANALYSIS

All analyses were descriptive and unweighted. Although the export included weights and stratified summaries, these were not used. Categorical variables were summarized as counts and percentages, and age as mean, standard deviation, and range. All 100 respondents had recorded responses to Q1–Q13. For multiple-response items, percentages used respondents as the denominator and could sum to more than 100%. Ratings of 1 or 2 on the knowledge item were combined as little or no knowledge; ratings of 4 or 5 on the recommendation item were combined as likely or definitely willing to recommend. Selected subgroup summaries were exploratory, used subgroup-specific denominators, and were not subjected to inferential testing. Open-ended responses were not included in the quantitative analysis.

RESULTS

RESPONDENT CHARACTERISTICS

The sample included 100 respondents, of whom 64 (64%) were female and 36 (36%) were male. Mean age was 63.5 ± 9.6 years (range, 47–85 years); 62 (62%) were aged 60 years or older. Twenty-seven respondents (27%) had completed some college, 21 (21%) had a bachelor's degree, and 15 (15%) had a master's degree. Using the combined race/ethnicity classification, 89 (89%) were White. Fifty respondents (50%) reported household income below \$50,000, and 12 (12%) reported income of \$100,000 or more. One declined to report income. Respondents resided in the South (45%), Midwest (24%), Northeast (21%), and West (10%). Profile selections included osteoarthritis in 49 (49%), rheumatoid arthritis in 45 (45%), joint replacement in 27 (27%), and osteoporosis in 13 (13%) ([Table 1](#)).

AWARENESS AND SELF-RATED KNOWLEDGE

Sixty respondents (60%) reported having heard of regenerative orthopedic therapies, 27 (27%) had not, and 13 (13%) were unsure. Across all 100 respondents, 84 (84%) recognized stem cell therapy, 30 (30%) recognized PRP, 16 (16%) recognized platelet-rich fibrin, and 3 (3%) recognized pro-

lotherapy; 12 (12%) selected none of these options. Thirty-three respondents (33%) rated their knowledge as none and 44 (44%) as little, yielding 77 (77%) with low self-rated knowledge. No respondent selected expert knowledge ([Table 2](#); [Figure 1](#)).

PERCEPTIONS OF EVIDENCE AND SAFETY

Forty-nine respondents (49%) believed regenerative orthopedic therapies were supported by strong scientific evidence, 46 (46%) were unsure, and 5 (5%) answered no. Forty (40%) believed the therapies were generally safer than orthopedic surgery, while 55 (55%) were unsure and 5 (5%) answered no. Thirty-seven (37%) believed some clinics exaggerated treatment benefits, 47 (47%) were unsure, and 16 (16%) answered no. Uncertainty was the most common response for safety and clinic exaggeration, but not for scientific evidence ([Table 3](#); [Figure 2A](#)).

TREATMENT CONSIDERATION AND RECOMMENDATIONS

Sixty-three respondents (63%) would consider PRP or stem cell therapy as an alternative to surgery if recommended by their doctor, 30 (30%) were unsure, and 7 (7%) would not. Thirty-five (35%) would travel out of state if treatment were unavailable locally, 34 (34%) were unsure, and 31 (31%) would not. Twenty-one (21%) selected likely or definitely willing to recommend regenerative therapy to others; 53 (53%) were unsure, 16 (16%) selected "may recommend," and 10 (10%) would not recommend it ([Table 4](#); [Figure 2B–C](#)).

PAYMENT PREFERENCES AND PERCEIVED BARRIERS

Forty-eight respondents (48%) would not pay out of pocket for a treatment session, and 29 (29%) would pay less than \$500. Sixteen (16%) would pay \$500–\$1,499, 4 (4%) would pay \$1,500–\$2,999, and 3 (3%) would pay \$3,000 or more. Seventy-seven (77%) believed insurance should cover regenerative orthopedic treatments ([Table 5](#)). Perceived reasons someone might not consider treatment included cost (72%), lack of insurance coverage (62%), doubt about effectiveness (59%), insufficient familiarity (53%), and absence of physician recommendation (39%) ([Table 6](#); [Figure 3A–B](#)).

INFORMATION SOURCES AND EXPLORATORY SUBGROUP SUMMARIES

Physicians were the primary source of general medical treatment information for 71 respondents (71%), followed by internet searches for 22 (22%), friends or family for 5 (5%), and social media and television/news for 1 (1%) each ([Table 7](#); [Figure 3C](#)). Willingness to consider physician-recommended therapy was reported by 27 of 36 men (75.0%) and 36 of 64 women (56.3%), and by 14 of 15 respondents with a master's degree (93.3%) and 4 of 10 with an associate's degree (40.0%). Among 41 respondents aged 65 years or older, 28 (68.3%) were unsure about recommending treatment to others. These comparisons were descriptive.

Table 1. Respondent characteristics

Variable	Category	N (%)	Notes
Age (years)	45–59	38 (38%)	Mean = 63.5; range 47–85
	60+	62 (62%)	Largest group
Gender	Female	64 (64%)	
	Male	36 (36%)	
Education	High school graduate	23 (23%)	
	Some college	27 (27%)	
	Associate's degree	10 (10%)	
	Bachelor's degree	21 (21%)	
	Master's degree	15 (15%)	
	Other education*	4 (4%)	
Household Income	<\$50,000	50 (50%)	
	\$50,000–\$99,999	37 (37%)	
	\$100,000+	12 (12%)	1 preferred not to answer
Race/Ethnicity	White	89 (89%)	
	Black/African American	7 (7%)	
	Hispanic	3 (3%)	
	Other	1 (1%)	
US Region	South	45 (45%)	
	Midwest	24 (24%)	
	Northeast	21 (21%)	
	West	10 (10%)	
MSK Conditions	Osteoarthritis	49 (49%)	Select all that applied
	Rheumatoid Arthritis	45 (45%)	
	Joint Replacement	27 (27%)	
	Osteoporosis	13 (13%)	

Values are unweighted. Percentages use all 100 respondents unless otherwise indicated.

*Other education includes vocational training (n = 2), middle school (n = 1), and some high school (n = 1). Race/ethnicity uses the platform's combined classification. Musculoskeletal history reflects unverified profile selections; multiple selections were permitted.

DISCUSSION

This survey identified a difference between recognition of regenerative orthopedic therapies and self-rated knowledge. Although 60% reported prior awareness and 84% recognized stem cell therapy when prompted, 77% rated their knowledge as little or none. These findings describe perceived familiarity; they do not demonstrate objectively poor comprehension or an inability to make informed decisions. Recognition of a specific term may also differ from recognition of the broader category “regenerative orthopedic therapies.”

Physicians were the predominant source of general medical information, and most respondents would consider treatment if their doctor recommended it. Prior research has examined the influence of physician recommendations on treatment decisions.⁹ However, this survey did not compare willingness with and without a recommendation, so it cannot quantify a recommendation effect. Likewise, the difference between considering treatment personally and recommending it to others may reflect different decision

contexts rather than distrust. General medical information sources were measured, but sources of awareness about regenerative therapies were not; the findings therefore do not establish that social media or physician education generated respondents' awareness.

Substantial uncertainty concerned scientific evidence, relative safety, and clinic claims. The questionnaire grouped diverse therapies and indications together, which limits interpretation of these responses. PRP studies and reports concerning unproven cell-based interventions address different products and clinical contexts.^{1–4} Reports of adverse events related to unapproved regenerative interventions further underscore the importance of product-specific counseling.¹⁰ Clinicians should distinguish evidence for a particular intervention from broad claims about regenerative medicine, discuss alternatives, and avoid implying that all interventions have the same benefits, risks, or regulatory status.

Cost and lack of insurance coverage were the most frequently selected perceived barriers. Most respondents would pay nothing or less than \$500 per session. These findings indicate payment preferences, not verified inability

Table 2. Awareness and self-rated knowledge

Question	Response	N	%
Q1: Heard of regen orthopedic therapies?	Yes	60	60%
	No	27	27%
	Not sure	13	13%
Q2: Specific therapies heard of (select all)	Stem cell therapy	84	84%
	PRP injections	30	30%
	PRF	16	16%
	None of the above	12	12%
	Prolotherapy	3	3%
Q3: Self-rated knowledge (1=none, 5=expert)	1 - No knowledge	33	33%
	2 - Little knowledge	44	44%
	3 - Some knowledge	15	15%
	4 - Quite a bit	8	8%
	5 - Expert	0	0%
	COMBINED: levels 1-2	77	77%

Values are unweighted. Percentages use all 100 respondents unless otherwise indicated. Multiple-response percentages may sum to more than 100%.

to afford treatment or actual treatment utilization. The survey did not collect clinic prices or insurance policy details and cannot determine whether respondents' preferred spending would cover a particular procedure. Respondents' support for insurance coverage also does not establish the clinical effectiveness or cost-effectiveness of the treatments.

Exploratory differences by gender, age, and education may help generate questions for future research. They should not be interpreted as established associations because no inferential comparisons were performed and several subgroups were small. Although prior research has considered health literacy in medical decision-making, health literacy was not measured here and cannot be inferred from educational attainment.¹¹ Counseling research supports further attention to how clinicians discuss unproven regenerative treatments with interested patients.¹²

LIMITATIONS

This study used a small, anonymous, opt-in online sample and is susceptible to self-selection and coverage bias. Respondents were predominantly White and female, and all were aged 47–85 years, limiting generalizability to the broader US adult population. Medical-history profile selections were self-reported and not verified. The study measured hypothetical intentions and self-rated knowledge rather than treatment uptake, objective knowledge, or clinical outcomes. The broad grouping of therapies obscured differences between interventions. The recommendation scale included “may recommend” below “unsure,” which may not represent a uniformly ordered scale. Analyses were unweighted and descriptive, and subgroup findings require confirmation. The cross-sectional design cannot establish causality.

CONCLUSION

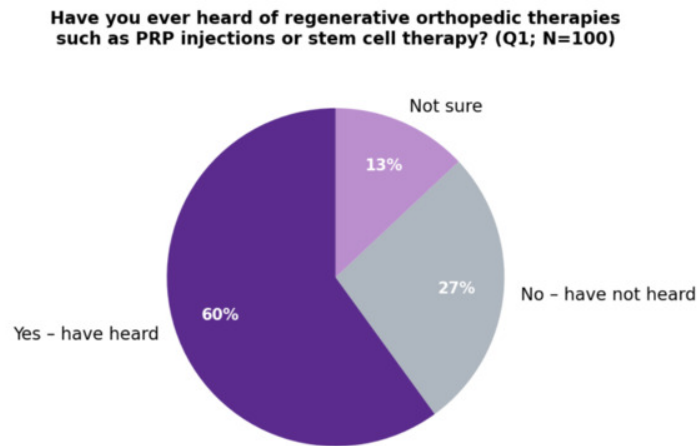
In this opt-in sample of 100 US adults, recognition of regenerative orthopedic therapies coexisted with low self-rated knowledge and uncertainty about evidence and safety. Physicians were the principal source of general medical information, and cost and insurance coverage were prominent perceived barriers. Clear, balanced counseling should address intervention-specific evidence, risks, alternatives, and financial considerations. These descriptive findings should be interpreted within the limits of the sample and survey design.

ETHICS STATEMENT

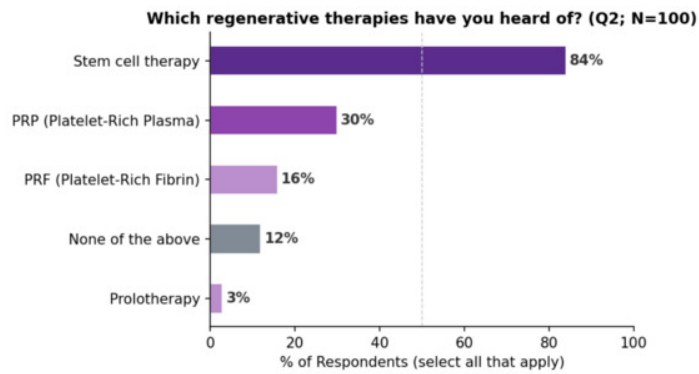
As survey results were obtained in a de-identified manner without the ability of the study authors to ever identify the individuals, the study meets the definition of Non-Human Subjects research in accordance with U.S. Federal Regulations (45 CFR 46.102).

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A



B



C

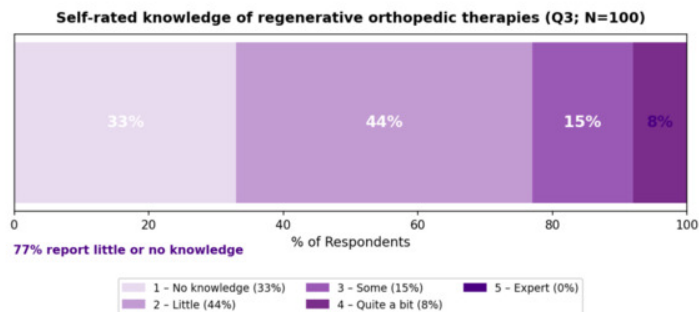


Figure 1. Awareness and self-rated knowledge.

A, Prior awareness (Q1). B, Specific therapies recognized (Q2; multiple responses permitted). C, Self-rated knowledge (Q3). All percentages are unweighted and use N = 100.

Table 3. Perceptions of evidence and safety

Question	Yes (%)	Unsure (%)	No (%)
Q4: Backed by strong scientific evidence?	49%	46%	5%
Q5: Generally safer than orthopedic surgery?	40%	55%	5%
Q6: Some clinics exaggerate benefits?	37%	47%	16%

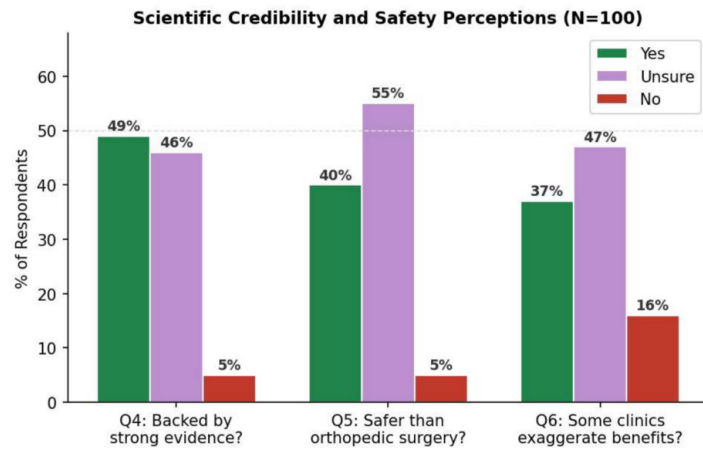
Values are unweighted. Percentages use all 100 respondents unless otherwise indicated.

Table 4. Treatment consideration and recommendations

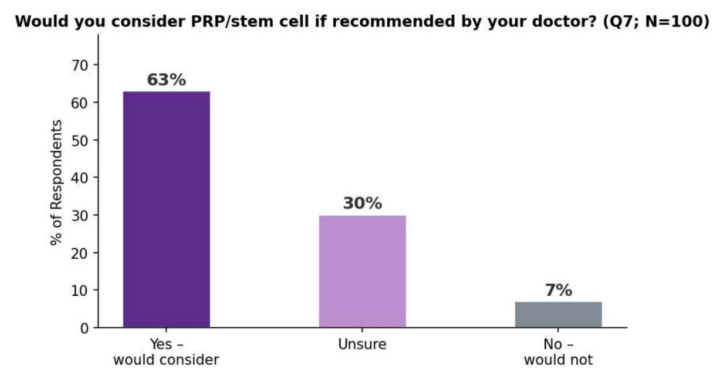
Question	Response	N	%
Q7: Would consider if MD-recommended?	Yes	63	63%
	Unsure	30	30%
	No	7	7%
Q9: Would travel out of state if not available locally?	Yes	35	35%
	Unsure	34	34%
	No	31	31%
Q10: Likelihood to recommend to others (1-5)	1 - Would not	10	10%
	2 - May recommend	16	16%
	3 - Unsure	53	53%
	4 - Likely would	11	11%
	5 - Definitely	10	10%
	COMBINED positive (4+5)	21	21%

Values are unweighted. Percentages use all 100 respondents unless otherwise indicated.

A



B



C

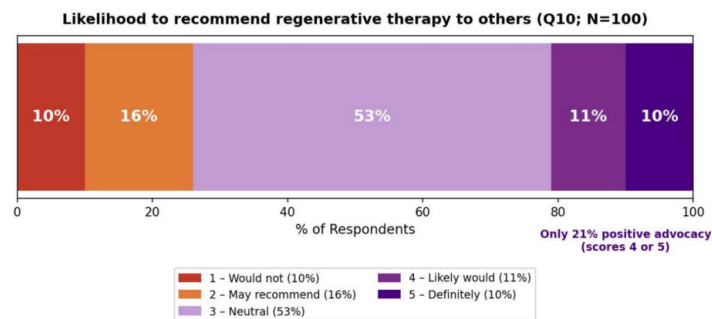


Figure 2. Treatment perceptions and willingness.

A, Evidence, safety, and clinic claims (Q4–Q6). B, Willingness to consider physician-recommended treatment (Q7). C, Willingness to recommend treatment (Q10). “Neutral” in panel C denotes the questionnaire response “Unsure about recommending or not”; “positive advocacy” denotes ratings 4 or 5. N = 100.

Table 5. Payment and insurance preferences

Question	Response	N	%
Q8: Willingness to pay OOP per session	Would not pay	48	48%
	Less than \$500	29	29%
	\$500-\$1,499	16	16%
	\$1,500-\$2,999	4	4%
	\$3,000 or more	3	3%
	COMBINED: \$0 or <\$500	77	77%
Q11: Should insurance cover regen therapy?	COMBINED: \$1,500+	7	7%
	Yes	77	77%
	Unsure	17	17%
	No	6	6%

Values are unweighted. Percentages use all 100 respondents unless otherwise indicated.

Table 6. Perceived barriers to considering treatment

Barrier	N	%	Domain
Cost	72	72%	Financial
Lack of insurance coverage	62	62%	Financial
Doubt about effectiveness	59	59%	Knowledge/Trust
Not familiar enough with therapy	53	53%	Knowledge/Trust
Doctor did not recommend it	39	39%	Clinical access

Values are unweighted. Percentages use all 100 respondents unless otherwise indicated.

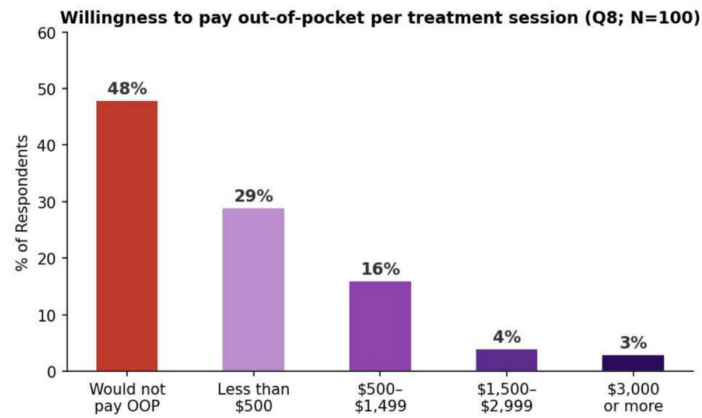
Multiple-response percentages may sum to more than 100%.

Table 7. Primary source of general medical treatment information

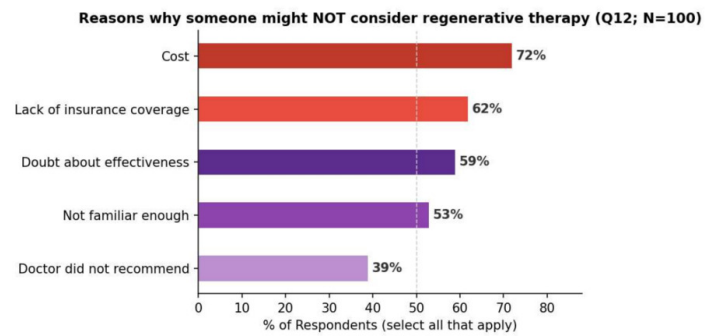
Source	N	%
Physician	71	71%
Internet search	22	22%
Friends or family	5	5%
Social media	1	1%
TV or news	1	1%

Values are unweighted. Percentages use all 100 respondents unless otherwise indicated.

A



B



C

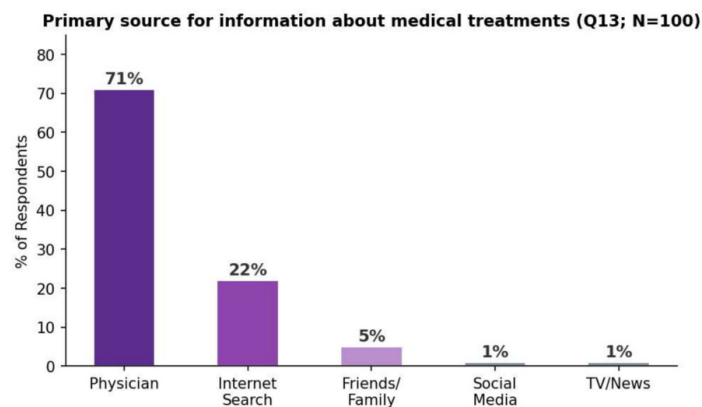


Figure 3. Payment preferences, perceived barriers, and information sources.

A, Willingness to pay per session (Q8). B, Reasons someone might not consider treatment (Q12; multiple responses permitted). C, Primary source of general medical information (Q13). All percentages are unweighted and use N = 100.

REFERENCES

1. Belk JW, Kraeutler MJ, Houck DA, Goodrich JA, Dragoo JL, McCarty EC. Platelet-rich plasma versus hyaluronic acid for knee osteoarthritis: a systematic review and meta-analysis of randomized controlled trials. *Am J Sports Med.* 2021;49(1):249-260. doi:[10.1177/0363546520909397](https://doi.org/10.1177/0363546520909397)
2. Dai WL, Zhou AG, Zhang H, Zhang J. Efficacy of platelet-rich plasma in the treatment of knee osteoarthritis: a meta-analysis of randomized controlled trials. *Arthroscopy.* 2017;33(3):659-670. doi:[10.1016/j.arthro.2016.09.024](https://doi.org/10.1016/j.arthro.2016.09.024)
3. Fitzpatrick J, Bulsara M, Zheng MH. The effectiveness of platelet-rich plasma in the treatment of tendinopathy: a meta-analysis of randomized controlled clinical trials. *Am J Sports Med.* 2017;45(1):226-233. doi:[10.1177/0363546516643716](https://doi.org/10.1177/0363546516643716)
4. Turner L. US stem cell clinics, patient safety, and the FDA. *Trends Mol Med.* 2015;21(5):271-273. doi:[10.1016/j.molmed.2015.02.008](https://doi.org/10.1016/j.molmed.2015.02.008)
5. Kingery MT, Schoof L, Strauss EJ, Bosco JA, Halbrecht J. Online direct-to-consumer advertising of stem cell therapy for musculoskeletal injury and disease: misinformation and violation of ethical and legal advertising parameters. *J Bone Joint Surg Am.* 2020;102(1):2-9. doi:[10.2106/JBJS.19.00714](https://doi.org/10.2106/JBJS.19.00714)
6. Sipp D, Caulfield T, Kaye J, et al. Marketing of unproven stem cell-based interventions: a call to action. *Sci Transl Med.* 2017;9(397):eaag0426. doi:[10.1126/scitranslmed.aag0426](https://doi.org/10.1126/scitranslmed.aag0426)
7. Arthurs JR, Master Z, Shapiro SA. Patient reported motivations for seeking stem cell therapy and considerations for counseling. *J Orthop Orthop Surg.* 2022;3(3):1-3. doi:[10.29245/2767-5130/2022/3.1162](https://doi.org/10.29245/2767-5130/2022/3.1162). PMID:38989057
8. Levine AD, Wolf LE. The roles and responsibilities of physicians in patients' decisions about unproven stem cell therapies. *J Law Med Ethics.* 2012;40(1):122-134. doi:[10.1111/j.1748-720X.2012.00650.x](https://doi.org/10.1111/j.1748-720X.2012.00650.x)
9. Gurmankin AD, Baron J, Hershey JC, Ubel PA. The role of physicians' recommendations in medical treatment decisions. *Med Decis Making.* 2002;22(3):262-271. doi:[10.1177/0272989X0202200314](https://doi.org/10.1177/0272989X0202200314)
10. Akkas F, Turner L, Richardson E. Adverse events related to unapproved stem cell products and other regenerative interventions: recommendations for more robust regulation of the direct-to-consumer marketplace. *Regen Med.* 2022;17(2):63-68. doi:[10.2217/rme-2021-0124](https://doi.org/10.2217/rme-2021-0124)
11. Brabers AEM, Rademakers JJDM, Groenewegen PP, van Dijk L, de Jong JD. What role does health literacy play in patients' involvement in medical decision-making? *PLoS One.* 2017;12(3):e0173316. doi:[10.1371/journal.pone.0173316](https://doi.org/10.1371/journal.pone.0173316). PMID:28257472
12. Smith C, Crowley A, Munsie M, et al. Academic physician specialists' approaches to counseling patients interested in unproven stem cell and regenerative therapies—a qualitative analysis. *Mayo Clin Proc.* 2021;96(12):3086-3096. doi:[10.1016/j.mayocp.2021.06.026](https://doi.org/10.1016/j.mayocp.2021.06.026)

APPENDIX 1

SURVEY QUESTIONNAIRE

The questionnaire wording and response options below reproduce the submitted instrument. Demographic and health-history variables were obtained separately from platform profile fields.

Q1 Have you ever heard of regenerative orthopedic therapies such as PRP injections or stem cell therapy?

- Yes
- No
- Not sure

Q2 Which of the following regenerative therapies have you heard of? (Select all that apply)

- Platelet-Rich Plasma (PRP) injections
- Stem cell therapy
- Prolotherapy
- Platelet-Rich Fibrin (PRF)
- None of the above

Q3 On a scale of 1 to 5, how would you rate your own knowledge of regenerative orthopedic therapies?

- 1 = No knowledge
- 2 = Little knowledge
- 3 = Some knowledge
- 4 = Quite a bit of knowledge
- 5 = Expert knowledge

Q4 Do you believe regenerative orthopedic therapies are backed by strong scientific evidence?

- Yes
- No
- Unsure

Q5 Do you believe regenerative therapies are generally safer than orthopedic surgery?

- Yes
- No
- Unsure

Q6 Do you believe some clinics exaggerate the benefits of regenerative therapies?

- Yes
- No
- Unsure

Q7 Would you consider PRP or stem cell therapy as an alternative to surgery if recommended by your doctor?

- Yes
- No
- Unsure

Q8 How much would you be willing to pay out-of-pocket for a single regenerative treatment session?

- I would not pay out-of-pocket
- Less than \$500
- \$500–\$1,499
- \$1,500–\$2,999
- \$3,000 or more

Q9 Would you be willing to travel out of state to receive regenerative therapy if it were not available locally?

- Yes
- No
- Unsure

Q10 On a scale of 1 to 5, how likely are you to recommend regenerative orthopedic therapy to a friend or family member?

- 1 = Would not recommend
- 2 = May recommend
- 3 = Unsure about recommending or not
- 4 = Likely would recommend
- 5 = Definitely would recommend

Q11 Do you believe health insurance should cover regenerative orthopedic treatments?

- Yes
- No
- Unsure

Q12 What are the reasons someone might NOT consider regenerative therapy? (Select all that apply)

- Cost
- Lack of insurance coverage
- Doubt about effectiveness
- Doctor did not recommend it
- Not familiar enough with it

Q13 Where do you primarily get information about medical treatments?

- Physician
- Internet search
- Social media
- Friends or family
- TV or news

Q14 Is there anything else you would like to share about your views on regenerative orthopedic therapies?

[Open-ended response]