

# Opinion: Patient reported motivations for seeking stem cell therapy and considerations for counseling

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## Article Info

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## Abstract

Stem cell therapies occupy a unique place in the American public's consciousness which has led to excessive enthusiasm over their potential to cure orthopedic conditions. Much has been written about direct-to-consumer marketing of cell therapies for a myriad of medical conditions. Far less has been studied on the attitudes that drive many patients to seek stem cell and orthobiologic therapies for musculoskeletal conditions. Previously published research on patient motivations for seeking stem cell therapy to treat orthopedic maladies such as osteoarthritis and chronic tendinopathies has shown that some patients were motivated by factors not supported by current medical evidence. These differing responses strongly suggest the need for patient-centered counseling to address misinformation about stem cell therapies for musculoskeletal conditions and increase health literacy about outcomes of orthobiologics.

## Introduction

Orthobiologics are substances obtained from the body used to reduce pain and aid in the repair of musculoskeletal conditions<sup>1</sup>. Their use, which has matured in the last 2 decades but still needs of more robust scientific evidence, has been conflated with stem cell therapy in the minds of both the public and some practitioners. The reason for the association is perhaps due to misleading claims by some providers offering direct-to-consumer regenerative and stem cell interventions and building on the public awareness and hype surrounding stem cells. Orthopedics and sports medicine patients account for over 68% of such clinics' clients<sup>2-5</sup>. Many orthopedic and sports medicine professional societies have published statements advocating for the responsible use of autologous cell-based interventions<sup>6-9</sup>. Previous studies have described direct-to-consumer marketing landscape of regenerative interventions that has focused on the allure of stem cells and misinformation in advertisements. Many such advertisements include pseudoscience and tokens of legitimacy which attempt to co-opt the scientific literature with false claims of efficacy<sup>10-15</sup>. As a result, patients are likely to have unreasonable expectations about the safety and potential efficacy of more common treatments or better established orthobiologics. Additionally, little is known about patient motivations for seeking stem cell and regenerative interventions or their sources of information.

## Reasons why patients seek stem cell treatments and their information sources

As part of our routine practice in counseling patients about orthobiologic treatment options, we asked three questions through a standardized intake form: (1) Why are you interested in stem cell treatment for your condition? (2) How did you find out about stem cell treatment for your condition? (3) Have you previously contacted a stem cell clinic? The responses to these questions were independently evaluated by two providers with experience counseling patients about orthobiologic therapies including platelet rich plasma and autologous minimally manipulated cell therapies from bone marrow or fat<sup>16</sup>.

We found that the most common reason why patients reported being interested in stem cell treatment for their condition was the desire to avoid or delay joint replacement or tendon repair. This was closely followed by motivations for treating or alleviating pain. Interestingly, many patients reported stem cells as being better than surgery or standard of care which has not been medically proven. Finally, some patients' reported their reason for seeking such therapies because stem cells can regenerate tissue or restore function, which has also not been validated for most orthopedic conditions<sup>16</sup>.

Our research has found most patients completed online research to learn about stem cell treatment for their condition and while we did not ask patients to specify which online resources, trusted online resources are most likely difficult for patients to discern. Many others were recommended such treatment from a friend or family member, or in some instances a healthcare provider. Other traditional and online media sources including social media, television, print advertisements and stem cell seminars were also reported sources of health information among those that patients evaluated. Finally, 40% of patients had prior contact with a stem cell clinic before reaching out to our consultation service.

Results from our studies surrounding patient attitudes for seeking stem cell and regenerative therapies for orthobiologics, and other studies outlining misinformation in direct-to-consumer advertising of stem cell therapy for musculoskeletal conditions<sup>14</sup>, strongly suggests the need for patient counseling and educational resources.

## Discussion and Future Directions

Efforts to understand patients' knowledge and motivations when considering both orthobiologic and stem cell treatment are essential if clinical providers intend to adequately counsel patients regarding all treatment options and obtain informed consent if an orthobiologic is a reasonable treatment option for patients seeking novel biologic therapies. We learned that while many patients

were motivated by a desire to manage symptoms of pain or restore physical function, others described motivations that are inconsistent with the current medical evidence.

We acknowledge that despite incomplete evidence in support of biologic therapies, patients remain interested in stem cell treatments for their orthopedic conditions and thus there is a dire need for ensuring appropriate counseling and communication with patients, and the need for validated resources to provide patients evidence-based information. To better provide patients with accurate information, we launched a regenerative medicine consult service and have engaged with thousands of patients seeking regenerative care. While orthopedists are trusted experts in musculoskeletal care, subspecialty experience in stem cell science or regenerative therapies varies among providers, creating the need to ensure standardization of how we communicate about such novel treatments and the provision of trusted sources of information for this emerging field.

Counseling practices should convey the circumstances for when a specific stem cell or orthobiologic therapy is appropriate and outline the skills for clinicians to debias patients against misinformation and stem cell hype while providing support and offering additional evidence-based resources that have been vetted by experts. Said resources should also be made available to patients online and in print as informational materials when possible<sup>17</sup>. Understanding patient motivations for such therapies remains an important first step to outlining the nature and pervasiveness of misinformation prior to developing best counseling practices and evidence-based patient educational resources. As growing evidence for orthobiologics is mounted, there is a need to best inform both providers and patients about orthobiologic and cellular therapies, effectively separating fact from fiction. This will enhance patient-clinician communication and shared decision-making that will best serve the clinical needs of patients.

## References

1. Finnoff JT, Awan TM, Borg-Stein J, et al. American Medical Society for Sports Medicine Position Statement: Principles for the Responsible Use of Regenerative Medicine in Sports Medicine. *Clin J Sport Med.* 2021; 31(6): 530-541.
2. Knoepfler PS, Turner LG. The FDA and the US direct-to-consumer marketplace for stem cell interventions: a temporal analysis. *Regen Med.* 2018; 13(1): 19-27.
3. Turner L. The US Direct-to-Consumer Marketplace for Autologous Stem Cell Interventions. *Perspect Biol Med.* 2018; 61(1): 7-24.
4. Turner L. The American stem cell sell in 2021: U.S. businesses selling unlicensed and unproven stem cell interventions. *Cell Stem Cell.* 2021; 28(11): 1891-1895.
5. Turner L, Knoepfler P. Selling Stem Cells in the USA: Assessing the Direct-to-Consumer Industry. *Cell Stem Cell.* 2016; 19(2): 154-157.

6. Manchikanti L, Centeno CJ, Atluri S, et al. Bone Marrow Concentrate (BMC) Therapy in Musculoskeletal Disorders: Evidence-Based Policy Position Statement of American Society of Interventional Pain Physicians (ASIPP). *Pain Physician.* 2020; 23(2): E85-E131.
7. Rodeo SA, Bedi A. 2019-2020 NFL and NFL Physician Society Orthobiologics Consensus Statement. *Sports Health.* 2020; 12(1): 58-60.
8. O'Keefe RJ, Tuan RS, Lane NE, et al. American Society for Bone and Mineral Research-Orthopaedic Research Society Joint Task Force Report on Cell-Based Therapies - Secondary Publication. *J Orthop Res.* 2020; 38(3): 485-502.
9. Shapiro SA, Finnoff JT, Awan TM, et al. Highlights from the American Medical Society for Sports Medicine position statement on responsible use of regenerative medicine and orthobiologics in sports medicine. *Br J Sports Med.* 2022; 56(3): 121-122.
10. Hawke B, Przybylo AR, Paciulli D, et al. How to Peddle Hope: An Analysis of YouTube Patient Testimonials of Unproven Stem Cell Treatments. *Stem Cell Reports.* 2019; 12(6): 1186-1189.
11. Kamenova K, Reshef A, Caulfield T. Representations of stem cell clinics on Twitter. *Stem Cell Rev Rep.* 2014; 10(6): 753-760.
12. Marcon AR, Murdoch B, Caulfield T. Fake news portrayals of stem cells and stem cell research. *Regen Med.* 2017; 12(7): 765-775.
13. Cook M, Richey A, Brafman DA, et al. Weighing up the evidence used by direct-to-consumer stem cell businesses. *Stem Cell Reports.* 2021.
14. Kingery MT, Schoof L, Strauss EJ, et al. 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.
15. 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.
16. Arthurs JR, Nordan LM, Hultgren BH, et al. Patients seeking stem cell therapies-a prospective qualitative analysis from a Regenerative Medicine Consult Service. *NPJ Regen Med.* 2022; 7(1): 20.
17. Arthurs JR, Martin Lillie CM, Master Z, et al. The Direct to Consumer Stem Cell Market and the Role of Primary Care Providers in Correcting Misinformation. *Journal of Primary Care & Community Health.* 2022; 13: 21501319221121460.