Oregon Health & Science University
School of Medicine

Scholarly Projects Final Report

Title

Contextualizing Patient Reported Outcomes of Sacroiliac Joint Denervation in the Setting of Insurance Coverage Termination

Student Investigator's Name

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Graduation Year

2026

Project Course

Scholarly Projects Curriculum

Co-Investigators *(Names, departments; institution if not OHSU)*

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Scholarly Project Final Report

Concentration Lead's Name

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Project/Research Question

How did patients who underwent sacroiliac joint denervation at OHSU report changes in their sacroiliac joint pain at first follow up following the procedure? Where there any trends in patient-reported pain when stratified by age, sex assigned at birth, performing physician, or BMI?

Type of Project *(Best description of your project; e.g., research study, quality improvement project, engineering project, etc.)*

Retrospective cross sectional (chart review) study

Key words *(4-10 words describing key aspects of your project)*

Sacroiliac lateral branches, joint denervation, Medicare, insurance coverage

Meeting Presentations

If your project was presented at a meeting besides the OHSU Capstone, please provide the meeting(s) name, location, date, and presentation format below (poster vs. podium presentation or other).

Not applicable

Publications *(Abstract, article, other)*

If your project was published, please provide reference(s) below in JAMA style.

Not applicable

Submission to Archive

Final reports will be archived in a central library to benefit other students and colleagues. Describe any restrictions below (e.g., hold until publication of article on a specific date).

No restrictions

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Next Steps

What are possible next steps that would build upon the results of this project? Could any data or tools resulting from the project have the potential to be used to answer new research questions by future medical students?

Next steps involve administering a survey to patients who meet criteria to determine their self-reported efficacy status post coverage termination and if they have found other modalities to manage their pain without access to SI RFA. This could inform need for a larger multi-site study of patient reported pain relief.

Please follow the link below and complete the archival process for your Project in addition to submitting your final report.

https://digitalcollections.ohsu.edu/submit/direct?ln=en&sub=SBMETD

Student's Signature/Date

X Jacob W Mazzola, MD 3/17/25

Student's full name

Mentor's Approval *(Signature/date)*

X Sandy Christiansen, MD 3/17/25

Mentor Name

Scholarly Project Final Report

Introduction *(≥250 words)*

Sacroiliac joint (SIJ) pain is a common source of chronic pain worldwide and can be debilitating for some people. Additionally, due to its prevalence and intractable nature, SI joint pain is a source of significant national healthcare spending in the United States.[1] Conservative management and minimally invasive techniques like corticosteroid injections are often associated with only short-term pain relief and functional improvement.[2] Because of this, radiofrequency ablation (RFA) has emerged as a technique increasingly utilized to treat complex, chronic SIJ pain.[3]

RFA is a minimally invasive procedure and has shown evidence to be effective at pain management for longer periods of time than other minimally invasive techniques.[4] Furthermore, RFA has been shown to curb healthcare spending and reduce opioid use.[2] These advantages highlight why over the last decade RFA has been an increasingly utilized treatment for chronic SIJ pain compared to other modalities.[5] Despite this, the technique is relatively new in the field of chronic pain management and has been the subject of growing investment in research on the procedure. In particular, there remains a need to better characterize clinically relevant anatomical variations of the SI joint and to further distinguish the nerve generators for different types of SIJ pain and whether they will be appropriately targeted with RFA.[6] This procedure had been previously covered by Medicare and Medicaid, which allowed means for patients with chronic SIJ pain to receive the procedure if certain criteria were met. This coverage also supported ongoing clinical research efforts to both optimize SIJ RFA and better understand its clinical implications.

In 2023, the Centers for Medicare & Medicaid Services (CMS) revised the local coverage determination (LCD) for sacroiliac joint injections and RFA procedures.[7] In this LCD revision, Medicare administrative contractors determined SIJ denervation to not be reasonable or necessary, and all coverage ended on 03/19/2023. Since this change, multiple new LCD revisions have been posted, with the latest effective revision date in 2025 maintaining the prior withdrawal of coverage for all SIJ denervation procedures, including traditional and cooled radiofrequency ablation (Coolief). The same LCD and subsequent revisions maintained insurance funding for SIJ injections, but increased the prerequisite requirements needed for coverage.

Following this, twelve pain societies, including the American Academy of Pain Medicine, American Society of Anesthesiologists, and the American Academy of Physical Medicine and Rehabilitation sent a letter to the Contractor Advisory Committee commenting on the complex considerations of SIJ pain in today's field.[8] Their statement expressed disappointment in the termination of coverage for SIJ denervation procedures and advocated for reestablishing coverage. Of note, the statement highlighted the anatomical differences between pain treated by SIJ injections and SIJ denervations.[4,9] The letter also highlighted research that has shown that intraarticular injections target anterior innervations of the SIJ, and such, are not therapeutic for posterior sacroiliac joint complex (PSIJC) generators of pain. Therefore, it is argued that current coverage guidelines, which only insures SIJ injections, now excludes patients with chronic pain from PSIJC generators of pain. SIJ injections also have been shown to have a shorter therapeutic window and therefore require more visits for a patient population that experiences disproportionate barriers to care.[4]

Chronic pain patients often rely on Medicare and Medicaid insurance to subsidize therapy for their chronic pain conditions, and termination of the LCD for SIJ denervation procedures has all but effectively removed SIJ RFA as a therapeutic option for many patients who experience debilitating sciatic and low back pain. The consequences for this are not only likely to impact patients in their day-to-day lives but also hindering continued research on SIJ denervation procedures. In response to the comments from pain societies, CMS has cited the need for additional data from high quality clinical trials before meaningful reconsiderations of the LCD can be made.[9] Much of the emerging evidence on the clinical efficacy of SIJ RFA has been positive; a

2022 systematic review found 15 of 16 recent clinical trials reported conclusions that supported utilizing RFA for chronic SIJ pain.[10]

Much of this ongoing discussion centers around the evidence needed to sway re-evaluation of the LCD and how production of new, high-quality data is hindered by the diminished incidence of SIJ denervation procedures being performed. But situated in these changes remains a population of individuals with chronic pain who now have less alternatives available to manage their pain. The importance of their voices cannot be understated in this conversation. This complex discussion would benefit greatly from the inclusion of patient points of view who used to receive this procedure and how these new limitations have affected their quality of life.

Methods *(≥250 words)*

This is a cross-sectional study designed to assess the satisfaction with SIJ RFA for patients who have previously undergone the procedure and examine their satisfaction with current management of SIJ pain now in the setting of insurance limitations for further SIJ RFA therapy. The investigation will be performed at the Comprehensive Pain Center (CPC) at Oregon Health and Science University (OHSU).

The primary endpoint for this study is to investigate whether SIJ RFA was reported useful in providing satisfactory pain relief via patient pain diaries discussed at first follow up following their latest procedure.

The hypothesis is more than half of patients meeting inclusion criteria will have indicated moderate (>30%) to significant pain relief (> 70% relief) at follow up and this tendency will persist through different tracked demographics. Tracked demographics will include age, sex assigned at birth, BMI, performing physician, and number of procedures underwent by each patient.

We ran an EPIC query to include all patients 18 and older who underwent SI RFA at OHSU via the CPT code 64625. Following, we accessed chart history to assess patient reported pain relief at first follow up following each SI RFA procedure which occurred between 1 and 3 months following SI RFA. If multiple procedures were undergone by patient, the latest procedure and follow up were used for record
Follow ups occurred between 2-3 months after SI RFA.

Inclusion Criteria:

- Previously underwent sacroiliac radiofrequency ablation at OHSU Comprehensive Pain Center
- Age equal to or greater than 18

Exclusion Criteria:

- Patient refusal to participate in survey
- Age 17 years or younger

Results *(≥500 words)*

There were 48 total patients who met eligibility criteria and were enrolled in the study. Table 1 shows demographic information for all patients who were enrolled in the study. Initial expectations were that 100 patients would be eligible, but many patients underwent multiple procedures (Figure 1). More women were enrolled than men, and over half of all recruited patients were between the ages of 61 and 80. 46 of 48 (95.8%) of patients identified as white, 2 patients identified as Native American/ Alaskan.

Demographic Information of Participants			
Participant Characteristics		Participants (n)	Percentage (%)
Total		48	100 %
Age	< 40	5	10.4 %
	40 - 59	10	20.8 %
	61 - 80	28	58.3 %
	> 80	5	10.4 %
Sex assigned at birth	Male	19	39.6 %
	Female	29	60.4 %
BMI	18.5 - 24.9	17	35.4 %
	25 - 29.9	12	25 %
	30 - 39.9	14	29.2 %
	> 40	5	10.4 %

Table 1.

Most patients (68.8%) underwent SI RFA only once, but during chart review, it was found that documentation from physicians at follow up noted that multiple patients attempted to undergo the procedure again but were denied by insurance after the 2023 coverage determination. Only one patient underwent the procedure a subsequent time after coverage termination (this required the patient to pay out of pocket costs). The highest number of procedures recorded was 9 instances of SI RFA by 2 patients. 11 patients underwent between 2 and 4 procedures (Figure 1).

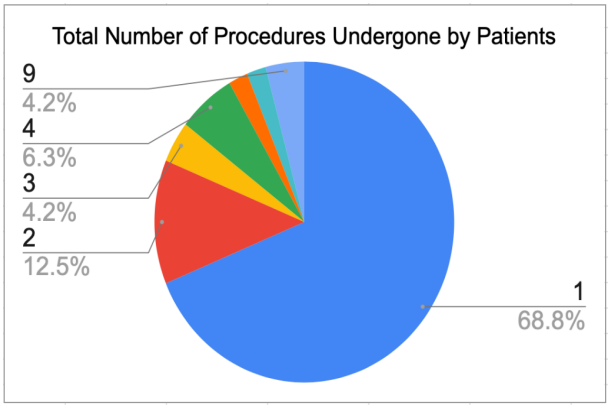

Figure 1.

Pain relief was broken into the following categories: Significant pain relief (>70% reported relief), Moderate relief (30% - 70% reported relief), Minimal pain relief (<30% reported relief), and No relief (0% reported relief). One patient also reported worse pain following the procedure, and 4 patients were lost to follow up (did not attend required follow up following latest SI RFA procedure). If patients underwent multiple procedures data was recorded from their latest instance of SI RFA.

All patients enrolled kept pain diaries where they recorded their daily pain scores and brought this information to their first follow up appointment. At that follow up they were asked to describe the degree of pain relief (in relative percent of pain relieved from the SI joint dysfunction) they felt they were experiencing in general by the time of follow up, using their pain diaries as a reference. All patients who presented to follow up filled out their pain diaries and had relative pain relief precents documented. Figure 2 delineates patient reported pain relief by sex assigned at birth. Significant, moderate, and minimal pain relief criteria were selected based on typical follow up documentation of patient reported pain relief (often in increments of 25%). Ranges were selected using reasonable cutoffs for what may qualify for minimal vs moderate pain relief, and to ensure any one category was not with too broad of a range so as to skew data (example: making moderate relief from 20% - 80%, etc.).

Overall, more than half of men and woman experienced significant (> 70%) pain relief. 67.9% of women experienced significant pain relief (>70%), and 78.6% of women had at least moderate pain relief (>30%). 50% of men experienced significant pain relief (>70%) and 62.5% of men experienced at least moderate pain relief (>30%) (Figure 2). For both men and women, no relief, minimal relief, and moderate relief were similarly proportional to each other in regards to their respective sample sizes, but women experienced a greater proportion of significant pain relief, making up the majority of the larger sample size of the demographic (29 vs 19).

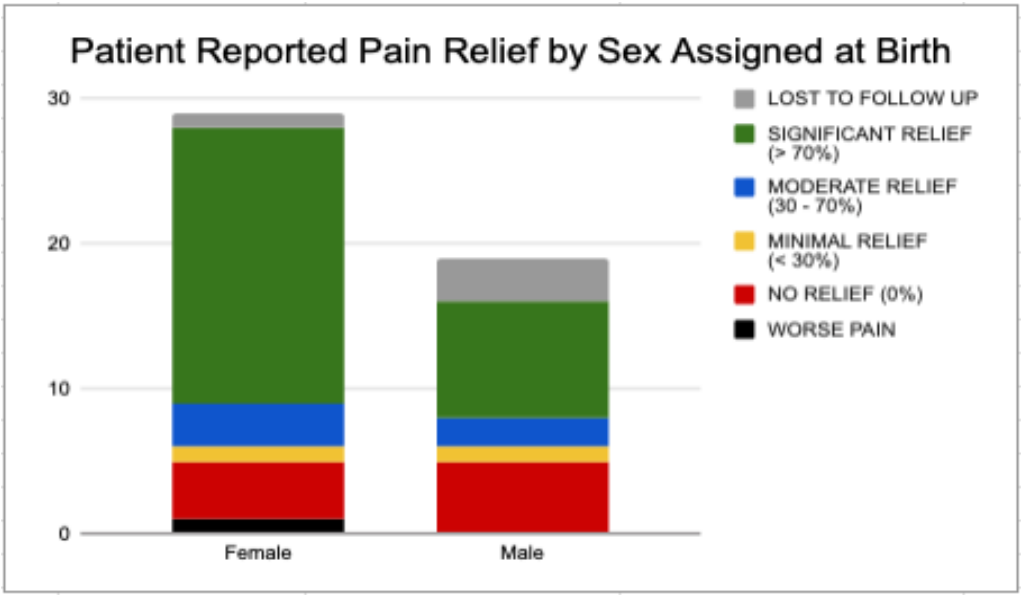

Figure 2.

Considering the lateral branches of the sacroiliac joint (the targets for nerve ablation in SI RFA) are not well characterized, there is some degree of variance in anatomical locations that can be targeted for ablation in SI RFA and clinical gestalt may play a role in variation in targeting. Considering this, results of pain relief were delineated to determine outcomes for each pain medicine physician who performed SI RFA in the study period. 6 physicians at OHSU's Comprehensive Pain Center were identified. 4 physicians performed procedures on 9 or more patients. One physician performed on 2 patients, and one physician on 5 patients.

Figure 3 indicates the proportions of each category of pain relief for each performing physician. For the 4 physicians who performed SI RFA on 9 or more patients, significant pain relief comprised the largest proportion of results. For these physicians, moderate to significant pain relief comprised 92%, 78%, 56%, and 89% of all patient outcomes for those who presented to follow up.

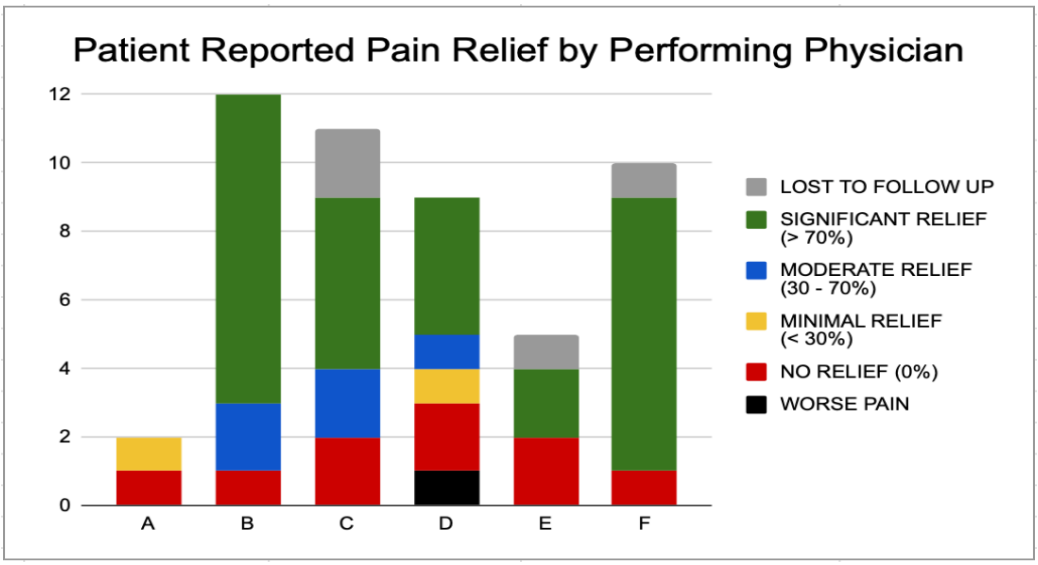

Figure 3.

Figure 4 shows a candlestick plot showing the range and quartiles of ages for each category of pain relief. Notably, patients who experienced no pain relief were overall older than patients who had significant or moderate relief. Though this difference was found to not be significant upon comparison of confidence intervals. Minimal relief and worse pain categories had small sample sizes and thus narrow data ranges. Patients who had significant or moderate relief had similar ranges and first (50sand third quartiles for age distribution, but those with moderate pain relief had a broader spread of age values than the significant category.

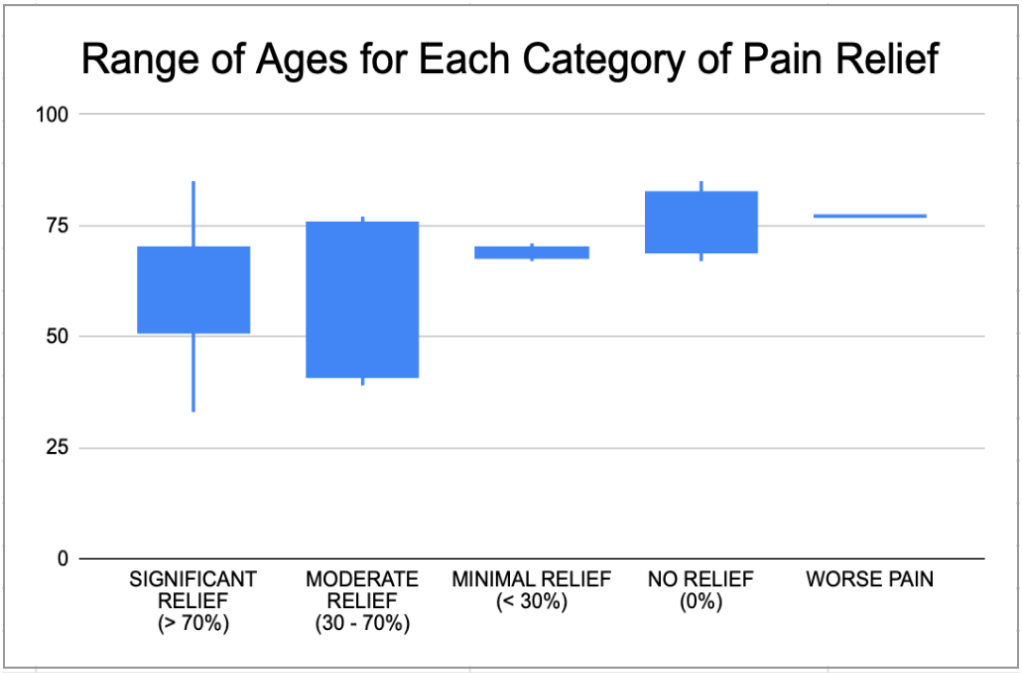

Figure 4. 95% Confidence Intervals: Significant: 56.1 – 67.6. Moderate 37.9 – 82.1. Minimal: 62 – 76. No relief: 69.7 – 80.3.

The final demographic tracked for the cohort was BMI. Overall, there was no significant differences in pain outcomes for patients when stratified by BMI. Minimal relief saw overall lower BMI values, but was with a much small sample size (2 patients) when compared to significant, moderate, and no relief. Both moderate and significant relief categories saw mean BMIs around 30, with first and third quartiles near 20 and 40 respectively.

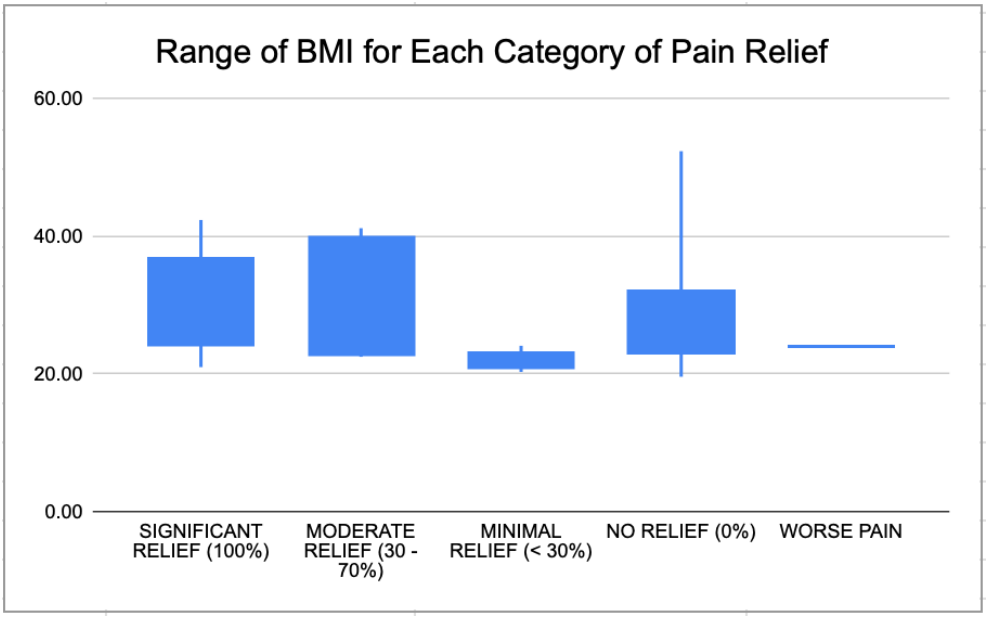

Figure 5. Confidence intervals likely unavailing considering homogeneity of data.

Discussion *(≥500 words)*

To date, twelve pain medicine societies have challenged CMS's coverage termination of SI RFA. Despite reviewing the literature and arguments presented by these societies, CMS reaffirmed their coverage determination again in early 2024. CMS noted their main reasoning was both that current literature is not strong enough to support the efficacy of the procedure in treating SI joint dysfunction and that there are other modalities (i.e. steroid injections of the SI joint) that adequately cover pain caused by SI joint dysfunction. Compilation of new, significant clinical trial and data now remains next to impossible with the vastly diminished quantity of procedures being performed.

Our data showed that of the 48 patients who underwent sacroiliac radiofrequency ablation at OHSU's Comprehensive Pain Center 44 patients presented to follow up and were able to have data about their pain relief following the procedure analyzed. Of 44 enrolled patients, 73% (32 of 44) saw moderate to significant pain relief (> 30% reported relief). Additionally, 5% (2 of 44) saw minimal relief (< 30%), 20.5% (9 of 44) patients saw no relief, and 1 patient experienced worse pain following the procedure.

These results support our hypothesis that the majority (over half) of patients who underwent this procedure will have seen at least moderate pain relief. In fact, 61.4% (27 of 44) patients saw significant pain relief (> 70%). Many patients who saw no pain reduction were found to have later undergone denervation of the lumbar facet joints, indicating they may not have had true SI joint dysfunction. This would further support the efficacy of SI RFA for treating pain related to nerve dysfunction of the lateral branches, as SI joint dysfunction is localized to the low back/ buttock region (as opposed to sciatica which radiates down the leg along the course of the sciatic nerve) and can be difficult to distinguish from lumbar facet joint dysfunction.

The majority of patients underwent SI RFA only once (Fig. 1), but many had requested and met prerequisites for subsequent procedures prior to coverage termination. The minimal time between procedures is 6 months, and while some patients who had sufficient pain relief from SI RFA to request repeat procedures had pain relief periods <6 months, some saw pain relief for up to years following their procedure. Pain relief also gave some patients capacity to engage more meaningfully in physical therapy, which in turn could have compounded their benefits from a single procedure. Thus, the number of procedures undergone by patients could not be reliably linked to positive or negative outcomes in regards to efficacy of SI RFA in this population.

Overall, women saw better efficacy in pain relief from SI RFA–78.6 and 67.9% of women saw moderate and significant pain relief respectively compared to 62.5% and 50% of men (Figure 2), though there were significantly more women enrolled in the study compared to men (Table 1). For both men and women, no relief, minimal relief, and moderate relief were similarly proportional to each other in regards to their respective sample sizes and no associations can be drawn to sex assigned at birth and pain relief outcomes.

The data on performing physician and pain relief showed no significant results when stratified by each physician's procedural outcomes (Figure 3). There were also multiple physicians who did not have significant amount of procedures performed which limited the data. While clinical gestalt possibly plays a role in procedural outcomes due to the poorly characterized nature of the lateral branch anatomy, no associations could be drawn from this data.

Figure 4 illustrates patient age ranges for each category of pain relief. Patients who reported no relief tended to be older than patient who did report relief, but the results were not significant (Fig. 4) when comparing each category's 95% confidence intervals, though this could simply be due to small sample sizes. Patients who saw significant or moderate pain relief had similar means and quartiles of age data. Other categories (no relief, minimal relief, worse pain) had to few data points to draw any conclusions. Additionally, Figure 5, which compares BMI to pain outcomes showed no discernable trends, with significant and moderate relief again showing similar trends of data, and other categories having limited utility due to their sample sizes.

Despite the data being from a single site and with a small sample size, this study indicates that SI RFA was helpful for a majority of patients at OHSU for SI joint pain regardless of demographics. Some trends emerged, like those with younger age and women having a greater proportion of outcomes with moderate to significant pain relief, but likely due to small sample sizes this data was not significant. Other limitations include the homogenous data population (95.8% of patients identified as white), follow up appointments from which pain data was collected occurred at various time intervals (1-3 months) which introduces additional variation in reporting of pain relief, and pain relief being assessed at only a single point in time. Further directions could include a new survey being sent out for patients who meet criteria to indicate their current views on how well their past procedure(s) helped their SI joint dysfunction, if they would undergo the procedure again if it was covered by insurance, and if they have found alternative modalities to cover their SI pain.

Unfortunately, further data collection that could support or refute the efficacy of SI RFA will now remain severely limited in the context of Medicaid and Medicare patients no longer having access to this procedure without huge out of pocket costs (only one patient enrolled in this study paid out of pocket for the procedure after coverage termination). Further, populations who are able to pay for this procedure will now be increasingly homogenous, and likely of a higher socioeconomic status, which even further limits the utility of new data collection. The sites of ablation involved in RFA also remain incompletely characterized and further clinical and anatomic data which could better distinguish the most efficacious sites for targeting will now also be limited. Termination for coverage of SI RFA has only shed more light onto the issue of SI joint dysfunction and its impact on health care spending and patient quality of life. Despite further investigation being hindered, the effect sacroiliac joint pain has on the healthcare industry and patients lives remains significant and an important issue to resolve.

Conclusions *(2-3 summary sentences)*

Sacroiliac radiofrequency ablation is one of the few modalities available to treat pain of the sacroiliac joint, which is a common source of chronic pain worldwide. Following insurance coverage termination due to questions of efficacy we conducted a study that found a majority of patients who underwent the procedure at Oregon Health & Science University reported significant pain relief. Further research on the procedure is now limited despite positive patient reported outcomes in this study and prior literature.

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