CLINICAL STUDY PROTOCOL

Observational Study of Individual or Group Template

Investigating the Impact of a Shared Decision-Making Tool on Patient Attitudes and Behaviors Regarding Treatment for Knee Osteoarthritis

2000032637

Protocol Version

February 18, 2022

Version 1

Confidentiality Statement:

APPROVED BY THE YALE UNIVERSITY IRB 4/27/2022

Synopsis

Purpose

The purpose of this study is to determine the impact of a Shared Decision-Making Tool (SDMT), which provides information about osteoarthritis disease progression, on a patient's decision to pursue treatment for knee osteoarthritis.

Primary Objective

The primary objective of this study is to assess the impact of the shared decision-making tool on a patient's decision to seek treatment for knee osteoarthritis.

Secondary Objective

Our secondary objectives include investigating the impact of the SDMT on patient understanding of disease progression as well as patient understanding of the impact of treatment on disease progression. Additional secondary objectives include evaluating the impact of the SDMT on patient behaviors and engagement with treatment modalities.

Study Design

This is a randomized control trial in which participants will be assigned to one of two arms. Patients in the control arm of the study will watch a short video and then receive standard of care counseling with an orthopaedic surgeon. Patients in the treatment arm of the study will watch a short video and then receive standard of care counseling with an orthopaedic surgeon that includes discussion of the SDMT. All patients will complete pre- and post-visit surveys designed to measure the severity of their knee osteoarthritis and their willingness to proceed with different treatment modalities.

All patients who are receiving care for knee osteoarthritis with one of the participating orthopaedic surgeons, and are greater than age 18 and speak English, will be eligible for inclusion in the study. The study will be conducted at Yale-affiliated clinics.

Study Date Range and Duration

Patient responses for this study will be collected between May 23rd, 2022– August 08th, 2022.

Number of Study Sites

- Yale Ortho – New Haven Office

  Yale Physician Building 800 Howard Ave 1st Fl New Haven, CT 06519

- Yale Ortho – Milford

  48 Wellington Rd Milford, CT 06461

- Yale Medicine Multispecialty

  800 Boston Post Rd Guilford, CT 06437

Primary Outcome Variables

The variables used to measure the primary outcome will include patient willingness to proceed with specific treatment modalities as measured by the pre- and post-visit surveys.
Secondary and Exploratory Outcome Variables (if applicable) The variables used to measure the secondary outcomes will include patient understanding of disease progression, patient understanding of the impact of treatment modalities on disease progression, patient-reported pain and functional status, and patient engagement in treatment modalities as measured by the pre- and post-visit surveys.
Study Population The target population for this study will be persons aged 45-65, who have mild to moderate knee pain, and are seeking care from an orthopaedic surgeon specializing in total knee arthroplasty.
Number of Participants We are seeking 200 participants. The attrition rate is assumed to be 10-20%. It may be lower due to the short follow-up period of one month, or higher given the targeted patient demographic. We anticipate enrolling 200-250 patients to account for loss to follow-up.
Study Schedule We anticipate at least an initial patient visit that would take 30-50 minutes including an explanation of the study and obtaining consent, pre-study survey, PROMIS survey, clinical exam, Shared Decision-Making Tool discussion, and any additional questions the patient may have.

Protocol Revision History

Include the IRB approved protocol version number and date for each revision of the protocol. All version history should remain in the table and never be deleted. The oldest IRB approved version of the protocol should be listed on the top row. The most recent IRB approved version should be listed on the bottom row.

Version Date	Summary of Substantial Changes

Statement of Compliance

This document is a protocol for a human research study. The purpose of this protocol is to ensure that this study is to be conducted according to the Common Rule at 45CFR46 (human subjects) and other applicable government regulations and Institutional research policies and procedures.

Abbreviations

Abbreviation	Explanation
OA	Osteoarthritis
PI	Principal Investigator
SDMT	Shared Decision-Making Tool
UPIRSO	Unanticipated Problems Involving Risks to Subjects or Others

Glossary of Terms

Glossary	Explanation

Table of Contents

1 Background/Literature Review

1.1 Background

Knee osteoarthritis (OA) is the most commonly diagnosed type of arthritis, with approximately thirteen percent of women and ten percent of men over age sixty suffering from symptomatic knee osteoarthritis. While the character and intensity of osteoarthritis (OA) symptoms is different for each patient, OA is generally a progressive disease that can result in disability, loss of function, and ultimate loss of quality of life for patients (Hsu & Siwiec, 2021). While OA has no cure, management of this condition centers around severity of symptoms and current disease progression, with common treatment modalities including exercise, weight loss, and patient education, with additional interventions such as non-steroidal anti-inflammatory drugs and intraarticular injections (Katz et al., 2021). Pursuing these non-operative interventions can lengthen the time a patient with osteoarthritis (OA) has before surgery, such as total joint replacement, becomes the primary option.

Utilizing shared decision-making (SDM) can facilitate conversations that can benefit patients before OA becomes a major health concern. SDM in the clinic relies on three principles: 1) having the clinician provide unbiased and accurate medical advice on all treatment alternatives, including the possibility of not receiving treatment; 2) having the clinician communicate these options to the patient; and 3) having the clinician respect and prioritize the patient's values and preferences based on the discussed information, goals of treatment, and future concerns and possible treatment burdens (Johnson, 2021). Therefore, building provider-patient communication tools that resonate with all stakeholders is necessary to inform patients as they work to make health decisions reflective of their individual beliefs.

Previous attempts to address these clinical concerns resulted in the development of the Shared Decision-Making Tool (SDMT), which was designed to provide a personalized, patient-centered framework for clinical discussions regarding treatment options for knee OA. The tool functions through patient input of information such as pain severity and current symptoms, alongside other demographic information such as age, race, and comorbidities, to offer a series of outcomes to better illustrate how the patient's specific disease presentation will progress (Johnson, 2021). Ultimately, using the SDMT may impact patient behavior if patients change their treatment preferences after utilizing the tool. This can empower them to seek additional support over time and maintain communication with their orthopedist to ensure they are on a healthier path.

In addition to the patient's efforts, the SDMT can address provider influences. Bias likely influences patients; experiences with clinicians, and the SDMT can serve to deter implicit bias by focusing on the disease of patients, thus avoiding the development of healthcare disparities (Marcelin et al., 2019). Encouraging individuals who have historically not taken advantage of preventive care or healthy lifestyles to induce change is paramount to making the medical experience in America more equal for all its citizens and reducing total societal costs.

This study seeks to determine if providing an overview of future disease progression through the SDMT helps patients, with a focus on the following concerns: i) whether it assists the patient with readiness for treatment; ii) whether the patient finds the overview and information helpful immediately and/or one month after the discussion; and iii) whether patients consider the mid- to long-term consequences of treatment options.

To address these concerns, we have designed a prospective study to observe the use of a SDMT and its impact on a patient's decision to pursue treatment options recommended by their provider.

Hsu H, Siwiec RM. Knee Osteoarthritis. [Updated 2021 Jul 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK507884/

Johnson C. B. (2021). A Personalized Shared Decision-Making Tool for Osteoarthritis Management of the Knee. *Orthopedic nursing*, *40*(2), 64–70. https://doi.org/10.1097/NOR.0000000000000739

Katz, J. N., Arant, K. R., & Loeser, R. F. (2021). Diagnosis and Treatment of Hip and Knee Osteoarthritis: A Review. *JAMA*, *325*(6), 568–578. https://doi.org/10.1001/jama.2020.22171

Marcelin J., Siraj D., Victor R., Kotadia S., Maldonado Y. (2019). The impact of unconscious bias in healthcare: How to recognize and mitigate it. *The Journal of Infectious Diseases*, 222(220 Suppl. 2), S62–S73. 10.1093/infdis/jiz214

1.2 Prior Experience (if applicable)

2 Rationale/Significance

2.1 Rationale and Study Significance

Research on the Shared Decision-Making (SDMT) is instrumental to determine if it is effective at motivating patients to pursue treatment options that can subsequently improve mobility and their quality of life.

2.2 Purpose of Study/Potential Impact

The main purpose of this study is to determine the impact of the SDMT on patient decision-making regarding various treatment modalities for knee OA. If the SDMT is found to be beneficial, it can be implemented to help engage patients in their care and support more efficient implementation of treatment suggestions. This subsequently will improve patient's quality of life. Getting patients who have not taken advantage of preventive care or healthy lifestyles to change is paramount to making the medical experience in America more equal for all its citizens and reducing total societal costs. Building provider-patient communication tools that resonate with all stakeholders should inform patients as they work to make health decisions that reflect their individual beliefs.

To determine whether this information helps patients, we have designed a prospective, randomized controlled implementation study outlined here.

2.3 Potential Risks and Benefits

2.3.1 Potential Risks

Participation in this research involves the potential risk of breach in confidentiality to the patient's stored health information.

2.3.2 Potential Benefits

The study provides patients with additional information about knee pain and osteoarthritis. The knowledge gained will help target helpful information for patients. The study can support providing an information tool used by patients to better understand the role of lifestyle and treatment on their prognosis.

3 Study Purpose and Objectives

3.1 Hypothesis

We hypothesize that patients who are exposed to the SDMT will have an increased willingness to pursue treatment modalities for OA.

3.2 Primary Objective

The primary objective of this study is to assess the impact of the shared decision-making tool on a patient's decision to seek treatment for knee osteoarthritis.

3.3 Secondary Objective (if applicable)

Our secondary objectives include investigating the impact of the SDMT on patient understanding of disease progression and patient understanding of the impact of treatment on disease progression. Additional secondary objectives include evaluating the impact of the SDMT on patient behaviors and engagement with treatment modalities.

4 Study Design

4.1.1 General Design Description

This is a randomized control trial in which participants will be assigned to one of two arms. Patients in the control arm of the study will watch a short video and then receive standard of care counseling with an orthopaedic surgeon. Patients in the treatment arm of the study will watch a short video and then receive standard of care counseling with an orthopaedic surgeon that includes discussion of the SDMT. All patients will complete pre- and post-visit surveys designed to measure the severity of their knee osteoarthritis and their willingness to proceed with different treatment modalities.

All patients who are receiving care for knee osteoarthritis with one of the participating orthopaedic surgeons, and are greater than age 18 and speak English, will be eligible for inclusion in the study. The study will be conducted at Yale-affiliated clinics.

4.1.2 Study Date Range and Duration

Patient responses for this study will be collected between May 23rd, 2022 – August 8th 2022.

4.1.3 Number of Study Sites

(1) New Haven Office - Yale Physician Bldg 800 Howard Ave 1st Fl New Haven, CT 06519

(2) Yale Milford - 48 Wellington Rd Milford, CT 06461

(3) Yale Medicine Multispecialty - 800 Boston Post Rd Guilford, CT 06437

4.2 Outcome Variables

4.2.1 Primary Outcome Variables

The variables used to measure the primary outcome will include patient willingness to proceed with specific treatment modalities as measured by the pre- and post-surveys.

4.2.2 Secondary and Exploratory Outcome Variables (if applicable)

The variables used to measure the secondary outcomes will include patient understanding of disease progression, patient understanding of the impact of treatment modalities on disease progression, patient reported pain and functional status, and patient engagement in treatment modalities as measured by the pre- and post-surveys.

4.3 Study Population

The target population for this study will be persons aged 45-65, who have mild to moderate knee pain seeking care from an orthopaedic surgeon specializing in total knee arthroplasty.

4.3.1 Number of Participants

The goal is to screen and accept 200-250 study participants

4.3.2 Eligibility Criteria/Vulnerable Populations

To be included in this study, an individual must be age 45-64 with mild to moderate knee pain consistent with a diagnosis of osteoarthritis. Exclusion criteria includes known inflammatory disease diagnosis (ex. Lupus, Sjogren, or rheumatoid arthritis, prior knee replacement, acute knee trauma), and BMI over 45. This study will not include persons from vulnerable populations.

5 Study Methods/Procedures

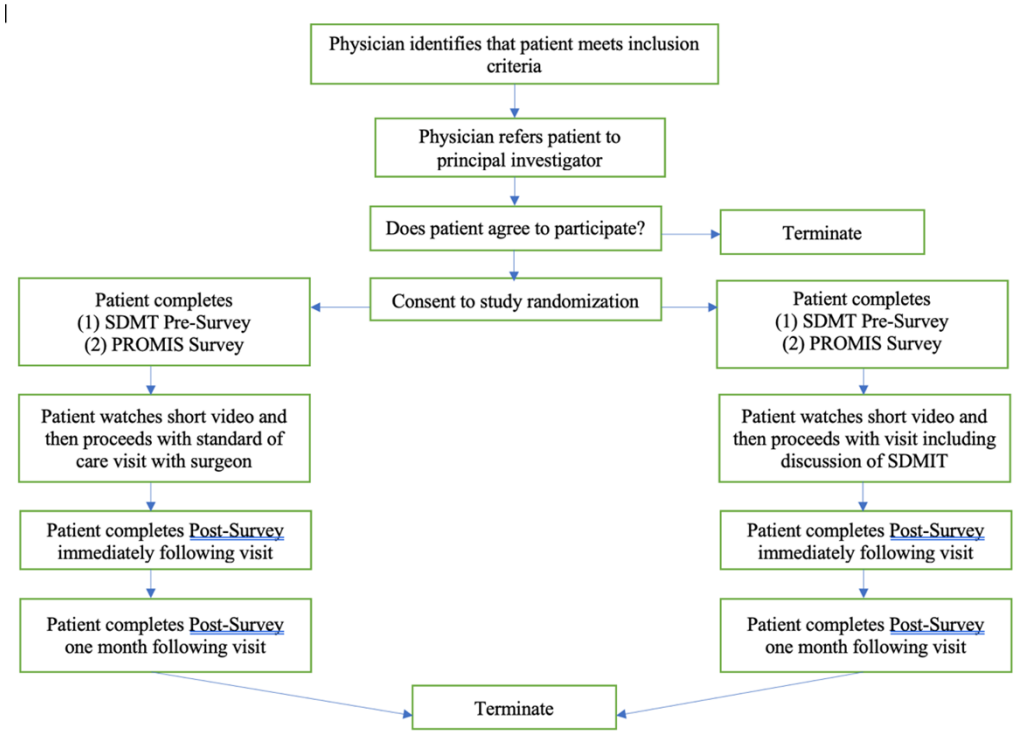
5.1 Study Procedures

Potential subjects will be identified by the PI and participating orthopaedic surgeons. The PI and Sub-I will recruit potential subjects for this study.

Subjects will be consented in a private room by a designated member of the study team. Each subject will be consented in the language appropriate and presented with a consent form, written in that language. All aspects of the study will be discussed with the potential subject including the reason the subject is being asked to participate, the schedule of visits, the study activities that will occur, and the risks and benefits of participation. The subject will then have an opportunity to ask any questions they have. Once all questions have been answered and the subject feels that he/she would like to participate, the designated member of the research team will obtain verbal consent for the study.

A subject's capacity to provide consent will be evaluated by a member of the consenting staff based on the questions the subject asks about his/her involvement in the study as well as by asking the subject questions pertaining to aspects of the study.

Eligible patients who agree to participate and provide verbal informed consent, will be randomized to participate in either the Control Group or Intervention Group. Both groups will complete the PROMIS Computer Adaptive Test and pre-survey as well as watch a short video providing general information about knee OA. The intervention for the intervention group will be the surgeon utilizing the SDMT during the visit. Both the control and intervention group will complete the post-event survey immediately after completing the control or intervention and then 1 month later.



5.1.1 Data Collection

Written survey responses will be collected from patients and electronic responses captured via iPad collection. Each patient will be assigned a random alphanumeric code that will be associated with their survey information. No specific patient identifiers will be recorded along with the survey data. Identifying patient information and research data will be de-identified at the earliest reasonable time after it is received or collected, and a unique study identifier code will be used which does not directly identify the participant. All computers will be password protected and all data will be kept in locked cabinets only accessible by members of the research team. Collaborators will be provided access to data after obtaining permission from the principal investigator.

5.1.2 Adverse Events Definition and Reporting

This protocol presents minimal risks to the subjects and Unanticipated Problems Involving Risks to Subjects or Others (UPIRSOs), including adverse events, are not anticipated. In the unlikely event that such events occur, Reportable Events (which are events that are serious or life-threatening and unanticipated (or anticipated but occurring with a greater frequency than expected) and possibly, probably, or definitely related) or Unanticipated Problems Involving Risks to Subjects or Others that may require a temporary or permanent interruption of study activities will be reported immediately (if possible), followed by a written report within 5 calendar days of the Principal Investigator becoming aware of the event to the IRB (using the appropriate forms from the website) and any appropriate funding and regulatory agencies. The investigator will apprise fellow investigators and study personnel of all UPIRSOs and adverse events that occur during the conduct of this research project via email as they are reviewed by the principal investigator. The protocol's research monitor(s) and regulatory and decision-making bodies will be informed of adverse events within 5 days of the event becoming known to the principal investigator.

Yale will minimize this risk of breach in confidentiality by (a) removing direct identifiers from stored participant information (e.g., names, medical record number); (b) securing any identifiable data in a separate location and limiting access to only those members of the research team listed on the protocol; (c) limiting access to stored information to only those members of the research team listed on the protocol.

5.2 Study Schedule

For this study patients will not need to schedule visits outside of normally requested appointments for care or follow-up. Participation in the study will lengthen the time of a normal visit and is expected to be a 45–50-minute appointment.

5.3 Informed Consent

A waiver of documentation of consent is requested due to the only record linking the subject and the research would be the informed consent form and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject (or legally authorized

representative) will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern.

5.3.1 Screening (if applicable)

Not applicable

5.3.2 Recruitment, Enrollment and Retention (if applicable)

Potential subjects will be identified by the PI and participating orthopaedic surgeons. PI and Sub-I will recruit potential subjects for this study.

Subject will be consented in a private room by a designated member of the study team listed above. Each subject will be consented in the language appropriate and presented with a consent form, written in that language. All aspects of the study will be discussed with the potential subject including the reason the subject is being asked to participate, the schedule of visits, the study activities that will occur, and the risks and benefits of participation. The subject will then have an opportunity to ask any questions they have. Once all questions have been answered and the subject feels that he/she would like to participate, the designated member of the research team will ask the subject to provide verbal consent.

A subject’s capacity to provide consent will be evaluated by a member of the consenting staff based on the questions the subject asks about his/her involvement in the study as well as by asking the subject questions pertaining to aspects of the study.

5.3.3 Study Visits (is applicable)

The only study visit will be the scheduled appointment with the orthopaedic surgery and subsequent meeting with the researcher.

5.4 Statistical Method

5.4.1 Statistical Design

Power Analysis

Statistical Power is determined by the estimated mean and standard deviation of one primary endpoint or composite endpoint to determine ending sample size in each group (test and control). The study power varies with Standard Deviation and Expected Difference in Performance between control and investigational groups. The power is the probability the study will detect a statistical difference between the two groups based on the expected standard deviation and mean difference between the two groups.

This study for which a power of 0.8 is sufficient and we expect a difference in score between the test group and control group to be at least 20% and a standard deviation of 10 points or less. Even if the difference between groups drops to 10% with a standard deviation of 10 points our target sample size of 200 patients is sufficiently powered.

5.4.2 Sample Size Considerations

We are collecting socioeconomic data, education level, insurance type, pain and activity data at the outset with the thought that these may be related to patient experience or confound the impact of the shared decision-making tool.

PROMIS is. standardized, validated tools with defined scoring methods. The three study specific tools (1. SDM Survey; 2. Post-Survey (immediately provided); 3. Post-Survey (One Month Follow-up Survey) would be scored independently using a 5 point scale for each line item. The score of 5 would apply to the most positive score and the score of 1 would apply to the least positive score.

Instrument	**Scoring**	**Comment**
Survey (Pre-appointment) (Baseline)	Yes / no or in buckets	Set initial understanding of patient sentiment prior to starting the study
PROMIS	Defined	Knee pain and activity scale
1. SDM Tool	1 to 5 point scale	Primary study outcome
2. Post-appointment Survey Follow-up	1 to 5 point scale	Same as Pre-survey and used to gauge changes in patient sentiment post-study
3. One Month Post-appointment Survey	1 to 5 point scale	Secondary study outcome

Table 2. Items 1 through 3 are the study outcome surveys.

5.4.3 Planned Analyses

We plan to perform univariate and multivariate regression analyses to assess associations between the SDMT and the patient willingness to proceed with specific treatment modalities. Additional univariate and multivariate regression analyses will be performed to assess our secondary study outcomes.

5.4.4 Analysis of Subject Characteristics (if applicable)

Not applicable

5.4.5 Interim Analysis (if applicable)

Not Applicable

5.4.6 Handling of Missing Data

Patients who have missing data will be excluded from the analysis.

6 Trial Administration

6.1 Ethical Considerations: Informed Consent/Assent and HIPAA Authorization

Each patient will be assigned a random alphanumeric code that will be associated with their survey information. No specific patient identifiers will be recorded along with the survey data. Identifying patient information and research data will be de-identified at the earliest reasonable time after it is received or collected, and a unique study identifier code will be used which does not directly identify the participant. All computers will be password protected and all data will be kept in locked cabinets only accessible by members of the research team. The principal investigator, study monitors, and student researchers will have access to the data. Identifiable data will be destroyed after 1 year and de-identified data will be destroyed after 5 years

Yale will minimize this risk of breach in confidentiality by (a) removing direct identifiers from stored participant information (e.g. names, medical record number); (b) securing any identifiable data in a separate location and limiting access to only those members of the research team listed on the protocol; (c) limiting access to stored information to only those members of the research team listed on the protocol.

Subject will be consented in a private room by a designated member of the study team listed above. Each subject will be consented in the language appropriate and presented with a consent form, written in that language. All aspects of the study will be discussed with the potential subject including the reason the subject is being asked to participate, the schedule of visits, the study activities that will occur, and the risks and benefits of participation. The subject will then have an opportunity to ask any questions they have. Once all questions have been answered and the subject feels that he/she would like to participate, the designated member of the research team will ask the subject to provide verbal consent. Participants will have time between the explanation of the project and the commencement of the appointment to consider and provide consent to participate. A subject's capacity to provide consent will be evaluated by a member of the consenting staff based on the questions the subject asks about his/her involvement in the study as well as by asking the subject questions pertaining to aspects of the study.

Additional text if applicable:

A verbal explanation will be provided in terms suited to the participant's comprehension of the purposes, procedures, and potential risks of the study and of their rights as research participants.

6.2 Institutional Review Board (IRB) Review

If this study is approved by the IRB protocol modifications, study team updates, reportable events, and unanticipated problems will be reported immediately, if possible, or within 5 days. The study is a prospective study conducted via survey data collection from patients.

6.3 Subject Confidentiality

Data will be collected via handwritten surveys entered the computer, paper files, and via electronic devices like an iPad. The physical files will be stored in locked filing cabinets while electronic data will be stored via laptop computer using encrypted software. The principal investigator, study monitors, and student researchers will have access to the data. Yale will minimize this risk of breach in confidentiality by (a) removing direct identifiers from stored participant information (e.g., names, medical record number); (b) securing any identifiable

data in a separate location and limiting access to only those members of the research team listed on the protocol; (c) limiting access to stored information to only those members of the research team listed on the protocol.

6.4 Deviations/Unanticipated Problems

This protocol presents minimal risks to the subjects and Unanticipated Problems Involving Risks to Subjects or Others (UPIRSOs), including adverse events, are not anticipated. In the unlikely event that such events occur, Reportable Events (which are events that are serious or life-threatening and unanticipated (or anticipated but occurring with a greater frequency than expected) and possibly, probably, or definitely related) or Unanticipated Problems Involving Risks to Subjects or Others that may require a temporary or permanent interruption of study activities will be reported immediately (if possible), followed by a written report within 5 calendar days of the Principal Investigator becoming aware of the event to the IRB (using the appropriate forms from the website) and any appropriate funding and regulatory agencies. The investigator will apprise fellow investigators and study personnel of all UPIRSOs and adverse events that occur during the conduct of this research project via email as they are reviewed by the principal investigator. The protocol's research monitor(s) and regulatory and decision-making bodies will be informed of adverse events within 5 days of the event becoming known to the principal investigator.

6.5 Data Quality Assurance

To ensure good clinical practices are followed, researchers will follow-up with the principal investigator to communicate weekly experiences and are expected to communicate any concerns, protocol deviation, or questions immediately. The principal investigator is responsible for monitoring the data, assuring protocol compliance, and conducting the safety reviews on a monthly basis.

6.6 Study Records

Study records include study surveys, consent forms, and subject medical records.

6.7 Access to Source

Each patient will be assigned a random alphanumeric code that will be associated with their survey information. No specific patient identifiers will be recorded along with the survey data. Identifying patient information and research data will be de-identified at the earliest reasonable time after it is received or collected, and a unique study identifier code will be used which does not directly identify the participant. All computers will be password protected and all data will be kept in locked cabinets only accessible by members of the research team. Collaborators will be provided access to data after obtaining permission from the principal investigator.

6.8 Data or Specimen Storage/Security

Data will be collected via handwritten surveys entered into the computer, paper files, and via electronic devices like an iPad. The physical files will be stored in locked filing cabinets while electronic data will be stored via laptop computer using encrypted software.

6.9 Retention of Records

Identified data will be retained for 1 year and deidentified data will be retained for 5 years. If permission is needed to remove or destroy data, the principal investigator will be to be contacted.

6.10 Study Monitoring

The principal investigator is responsible for monitoring the data, assuring protocol compliance, and conducting the safety reviews on a monthly basis. During the review process the principal investigator will evaluate whether the study should continue unchanged, require modification/amendment, or close to further enrollment.

6.11 Study Modification

The principal investigator, the Institutional Review Board (IRB), or study monitor have the authority to stop or suspend the study or require modifications.

6.12 Study Completion

This study's anticipated completion date for data collection is May 23rd, 2022 – August 08th, 2022, IRB will be contacted via email to provide written confirmation of the study completion.

6.13 Funding Source

There is currently no funding request or support for this study.

6.14 Conflict of Interest Policy

There are no conflicts of interest to report.

6.15 Publication Plan

Once the research is complete, there is a plan to submit to peer-reviewed journals for publication along with submission to specialty-related conferences for presentation.

Appendices

Appendix #	Title	Section	Topic

List of Tables