

Sport Injury Rehabilitation of Recreational Athletes

Karthik Nama Anil
Kyle Andrade
Sean Lu
Luke Austin Passmore
Xiaoliang Yan

Investigating the pain of recreational athletes in sport rehabilitation and the void in
the rehabilitation treatment process

"Project Assignment 1: User Research"

Table of Contents

Table of Contents	1
Executive Summary	2
Socio-Technical System	3
Task Environment	3
Strength and Deficiencies of the Current Approach	3
Existing Systems and Related Literature	4
Larger Context of Design	6
User Research Methods	7
Methods and Rationale	7
Detail of the Methods and Examples	8
Analysis of User Research Data	9
User Persona	12
Initial Design Implication	15
Appendices	16

Executive Summary

Physical injuries from sports, degenerative wear, and common accidents have always been significant burdens to our daily routine. This is especially true for any injuries that pertain to mobility, such as a knee dislocation or ankle sprain. Our approach to studying this problem consisted of research of scholarly articles on orthopaedics and mobility injuries, followed by a general survey about injuries sent to a broad assortment of people, and then finally more personalized and in depth interviews with people who have suffered from lower body injuries. Through this methodology we discovered that these injuries while inconvenient are completely treatable with the ability to make full recoveries as long as they are given time and the right advice. But without the appropriate rehabilitation programs and therapeutics, the recovery process could develop into an extended period for the patients to struggle in pain. Insufficient therapeutic availability in addition to the mounting costs of consultation and treatment, place significant uncertainty in front of the people who are suffering from injury recovery. This is a glaring difference compared to the recovery of professional athletes who are surrounded by teams of medical professionals every day. The approach we developed to face this problem is to educate recreational athletes so that they can perform self-managed recovery with only the occasional aid of experts, thereby narrowing the gap in rehab experience between professional athletes and everyone else.

Socio-Technical System

Task Environment

Recovery from a physical injury is a lengthy process which can take weeks and months to complete. As a result, people who suffer from a mobility injury go through the process of rehabilitation during their everyday routine. However, the everyday routine for one person is vastly different from the routine of another person. Some people may be at work a majority of the day, at home, at school, or a combination of environments. All these different environments each have a different impact on the activity of rehabilitation.

An environment like a home where a person resides and rests is the first type of environment we will look at. On average, people are at home for around half the day, so a lot of time is spent here. At home, all activities are almost completely private when indoors. People are able to be mobile within the constraints of the home, but sometimes furniture may get in the way. There are also little interruptions at home other than potential external communications such as a phone call or email. For the most part, the home environment is very free and flexible, as a home should be.

Another type of environment where people spend a large amount of their time is at work. A standard 9-5 job will restrict someone from leaving the workplace for 8 hours. In the workplace, the conditions are much different from home. There is very little privacy because there are so many employees around. The most private place to do something is in the bathroom. There is also a limited amount of mobility allowed by the workplace environment. The largest restriction in a workplace is the interruptibility. The primary focus of a workplace is work, so a person may be constantly interrupted by tasks or contacts for work-related issues. In addition, a person's free time to deal with other activities may be restricted to only short breaks throughout the day.

Strength and Deficiencies of the Current Approach

While we have discovered through research that this domain in health and fitness has many problems, that does not mean that the system in place is void of strengths. There are aspects that the current system gets right. For one, the current approach for dealing with lower body injuries consists of physically meeting and talking with your doctor or some type of medical professional, and the majority of the time patients will confirm that they got an accurate diagnosis of their injury. These face to face interactions provide certainty and confidence to patients that their path to recovery will be successful.

However, it is due to this strength where many of the deficiencies for this system are created. There are only so many medical professionals in the field of orthopedics, so merely making an appointment will take time and could be scheduled inconveniently for the patient. Additionally, the method of transportation to the appointment is a consideration for the injured person. For example, if you have a sprained ankle, driving may not be an option. The person with the injury would then have to rely on a family member or friend to give you a ride, and if that is the case, the doctor's appointment now needs to

be planned around the schedule of multiple people. The other option is for the patient to pay for a ridesharing service to take them to and from the doctor's office, thus adding more to the cost factor of this injury. With the potential of repeated doctor's visits, these methods of transportation could quickly become very frustrating either for the added effort for each trip or the added monetary cost.

Furthermore, the amount of financial stress that medical bills can exert onto a person is a concerning factor in this system. "An initial [orthopaedic] consultation costs can exceed \$250 without medical insurance coverage. If extra tests are performed the day of the consultation, the costs will rise." (Orange County Orthopedics) Follow-up exams and physical therapy consultations will also add to the overall cost to an injury, especially when considering potential transportation costs. These factors make it clear why repeated appointments are more likely to be canceled by patients. Many people just do not have the financial stability or insurance benefits to keep up with this society's healthcare costs.

Many people will opt for prevalent resources such as WebMD and other self-diagnosing websites over doctor visits in order to save time and money. However, the problem with this is that such resources do not always provide the most accurate results. "A 2019 study focused just on WebMD's accuracy in regard to eye diagnoses. That study found the correct diagnosis was in the top three results just 38% of the time." (Spry, Puckett, Tregde) The questionable accuracy of information is a big downside and deficiency to researching information online.

Finally, another deficiency in the system is that the injured athlete may not know when exactly they are fully healed. With serious injuries that require surgery, such as fractures or tears to major ligaments, doctors are more specific about the recovery process, such as a detailed timetable. Additionally, the patient may have several required follow up visits and physical therapy sessions. However, when compared to more less serious injuries, such as minor sprains and dislocations, the certainty of when an athlete is fully healed is more difficult to specify. Without periodic reevaluations from doctors and the disinformation that a generic symptom search engine may give a user, it becomes likely that this person suffering the injury may return to their sport or exercise too soon. This can lead to a relapse of the injury and the possibility of creating more problems for the athlete down the line.

In summary, the deficiencies with the current approach include the time and monetary costs of repeated appointments with medical professionals, inconsistencies and inaccuracies with self-diagnosis aided by online resources, and uncertainty with the progress of recovery. The solution suggested in this document looks to provide a more personal and informed self-managed recovery process.

Existing Systems and Related Literature

The most prominent related existing systems are solutions that allow for 24/7 mobile doctor appointments. Mobile appointments are done through calls or video chats. The benefits of these existing systems is that it increases the amount of communication possible between doctors and patients by removing certain restrictions. In mobile appointments, mobility is not necessary in order to travel to the doctor's office. In addition, no travel time to the office is required. In some cases, the monetary cost is

also less. While mobile doctor appointments provide the possibility of increased communication, there is still the uncertainty of followup visits and treatment outside of the appointment itself.

There are a wide variety of “educational” apps on mobile phones for sports injury rehab. These apps provide information and knowledge on certain injuries, treatment, exercise routines, and suggestions. However, a lot of these apps are not backed by any medical professionals. The main positives these apps provide is the fact that it is easily accessible on your mobile phone and that all the information is consolidated in one place. Other than these points, there is no difference from simply going online to search for a question related to a rehab process that comes with more medical expertise.

The most complex existing solution we found is an app called Pt Pal, which is almost a combination of the above two. Although Pt Pal does not allow for online mobile appointments through calls, it reinforces the idea of enhanced communication between the doctor and patient. Doctors are able to use the app to send treatment plans, messages, reminders, and activities directly to the patient’s phone. When used this way, Pt Pal acts as a supplement to doctor appointments. Outside of the office, doctors can still keep tabs on the patient through these messages. A great feature in this app is that doctors who send exercise recommendations to patients can actually monitor if patients do them. This feature helps alleviate the worry of whether or not a patient is doing the right things to recover faster outside of the doctor’s office.

Larger Context of Design

First, the primary user of our design would be the recreational athletes in need of the medical consultation and monitoring, and the doctors who would like to improve the quality of consultation. The environment where the design is utilized is then split in two categories: the everyday recovery routine of the patient, and the medical consulting office of the doctors. On the patient side, the design should be accessible and interpretable at any time in any routine environment; whereas on the doctor’s side, the information should be accessible and visualizable for further examination. In other words, data collection and information must be obtainable in any routine environment, and the data should be transferred and communicated to the medical consultation team without any manual effort from the patients.

Second, the other stakeholders of the technology include but not limited to the family, friends, teammates and coaches of the recreational athlete. The design of the prototype would be required to function without intrusion to the daily routine of the recreational athlete. It should be easy to wear/use without inhibiting the athletes’ ability to perform recovery tasks. The time constraints of the design are also important to factor in. It is understandable that the patient would not want to use it during sleep or any other time that may cause them to feel uncomfortable.

Finally, the design of the device needs to work in the everyday routine of the users. This means that the design should work at home, at work, at the grocery store, etc. In order to accommodate the portability of the design, the presence of wireless technology through an IoT platform should be incorporated. The IoT system requires some sort of data transmission such as bluetooth or wireless connection. The hardware of the device would need to utilize this connection in order to communicate with a location where collected data can be analyzed and interpreted.

User Research Methods

Methods and Rationale

We adopted a multi-modal approach to understanding the problem space. Our research involved an initial survey, followed by semi-structured interviews and lastly reviewing online articles to get a deeper understanding of the current trends and techniques used in the problem space. The three research methods adopted in our research did not compete with each other but rather complemented each other by addressing the pitfalls in the other methods.

Survey

We sent out an online Google Form (we did not capture any user-identifying information) with eight simple questions that helped to narrow down our problem space and at the same time determine if there is any value (social and monetary value) to innovate in the health recovery domain. The online survey could be filled online by any user in three to five minutes. The online survey was in English and comprised of a combination of multiple-choice questions and descriptive questions. (Refer Appendix A1(a). Survey for more details)

Semi-Structured Interviews

From the initial survey, we were able to determine that the majority of our users reported physical injuries to the lower half of the body. We narrowed down the scope of research to temporary mobility injuries that do not require surgery (i.e. sprained ankle, pulled hamstring, etc.). We opted for a semi-structured interview approach where we spoke to a few injured recreational athletes who are currently recovering from a leg injury or recovered recently. We also discussed the issue with a few doctors and health recovery experts. After reviewing the responses from the online survey, we observed that surveys alone could not provide us with the granular information that we would like to know to understand the problem space clearly. We wanted to know stories, quotes and experiences of previously injured recreational athletes. The quantitative nature of the online surveys could never provide the information we were looking for. Thus we felt semi-structured interviews were a more effective way to gather the relevant details about the user. (Refer Appendix A1(b). Semi-Structured Interviews for more details)

Online Resources

None of us in the team are experts in health recovery and did not have any prior knowledge in the health recovery domain. Online blog posts, interviews and other articles helped us to understand the problem space thoroughly. Additionally, online resources provided more clarity on some of the terms and terminology used by the doctors and injured recreational athletes that we were not aware of. Furthermore, online resources provided us with information about the current techniques and processes adopted by the users during the recovery process. (Refer Appendix A2. Other Resources in Research for more details)

Detail of the Methods and Examples

We conducted semi-structured interviews for our stakeholders. We concluded that the recreational athletes and doctors (and other experts) were the primary stakeholders. We observed that the secondary stakeholders (family and friends of the injured recreational athletes) reiterated the same details provided by the primary stakeholders. The primary and secondary stakeholders provided us with the same information during the interview process. Thus we will not be involving the secondary stakeholder for the remaining part of the project.

We did not observe a single stakeholder in any environment. Injury recovery is a long process and practically feasible to observe them for long periods. Thus we resorted to semi-structured interviews to obtain the necessary information.

Target User Group	Number Observed	Number Interviewed	Other
Recreational Athletes	0	5	We deployed a survey to 50 recreational athletes. 42 completed the survey, 4 partially completed the survey, 4 did not respond at all and we interviewed 5 individuals from the candidate pool. All 46 who responded self-identified as recreational athletes and are actively involved in at least one sport
Doctors / Rehab Specialists	0	4	We conducted 4 semi-structured interviews with doctors and other rehabilitation specialists
Friends & Family of Recreational Athletes	0	3	We conducted 3 semi-structured interviews of friends and family of the injured athletes.

Table A. User Research Report

Analysis of User Research Data

	Interview	Survey	Online Research/Observation
Description of Approach	Interviews with injured athletes, sport rehab associates and doctors	Surveys to people from 10 to 50 age groups, 46 responses	Collected common heuristics and statistics in the sport rehab problem space
Rationale for Approach	We wanted to have direct communication with the primary stakeholders in the sport rehab space	We sent out surveys to different age groups who had experience with recreational sports to obtain quantitative feedback on the rehab process and experience	We observed discussions online and collected data from statistics in articles and scholarly papers to obtain a general statistical/holistic understanding
Thematic Analysis	The interview questions were categorized into different themes such as doctor's appointment experience, rehab process and technology involved in the rehab	The survey divides questions based on severity of injury, doctor visits and devices recommended by the doctors	The online resources were broken down into medical recommendations, complaints on the appointment system and physical therapy options
Affinity Diagram	Interview results were collected and interpreted into specific events, quotes and implications. The interesting part was that we collected different perspectives on the same subject from different stakeholders.	The information was then collected to reflect the affinity diagrams. Quotes from the surveyed were obtained and combined with the interview results	Online research helps formulate the trunk of the affinity diagram and provides some insights the interviewees are unwilling to share
Statistics	Qualitative results were combined and collected to support quantitative analysis from other research methods	Statistics support the claims from the interview regarding the injury types, devices necessary and approval rate of medical recommendations	Basic statistics are provided as a whole among all age groups in the problem space. The most prevalent complaints and pressing issues are displayed

Table B. Analysis of User Research Data

Based on the result from our interview, survey and online observation/research, an integrated affinity diagram is created to reflect the categories of primary stakeholders and the respective issues they are facing. (Appendix A3) Again, there are two different primary stakeholder in our analysis: the recreational athletes who suffered from a recoverable injury and the doctors as well as medical staff who are responsible for the recovery consultation and treatment.

With respect to the medical professionals, the problem can be further broken down into doctor's advice, and doctor's appointment problems. It is noted that sometimes the patients consider the advice from Doctors unhelpful. "Doctors gave me a brace and did not give any other clear instruction" an interviewee mentioned; whereas the doctors complain that the specialist would be more experienced to give specific advice and trace the progress. This leads the patients to believe that the advice from the doctors is too generic and does not fit their own situation, "I could find the same advice online and I don't feel like visiting the doctor again." Overall, the generic information available to doctors is becoming less attractive to patients who are in need of assistance. They may choose not to visit the doctors, claiming that the quality of service is not sufficient.

The second aspect of the doctor's problem is with the lengthy appointment process. With the exception of urgent care, the typical appointment process can take days to complete. By the time the patients reach the doctors, the best treatment period may have passed. This leads to complication in treatment options and severity of the injury. Therefore, the patients are subject to more expensive examination processes such as blood tests, X-rays and MRI. The patients also complained that the meetings with doctors seem rushed, "I had to take an Uber to every doctor's appointment, but the first appointment is normally generic advice." This further ramps up the financial and time cost for the patient to visit the doctor. Many patients decided to wait until it was inevitable, "I waited 3 weeks before seeing the doctor because by that time it just hurt too much." With that being said, follow ups are sometimes ignored and the patients have a tendency to avoid additional cost and time in medical treatment. Ultimately, the doctors are losing patients because of the generic nature of their advice and the ramping cost of consultation. There is plenty of room for improvement on the doctor's side, and the doctors would benefit from overcoming the inefficient stereotypes.

Moving on to the recreational athletes and injuries, there are three major perspectives from our interview data and survey results: patients' perception of the recovery process, the factors that affect the recovery process, and the injury's effect on everyday life. First, the patients' perception of the recovery process is rather unclear and vague. It is reported that many of the interviewees get back to their original daily routine before they were ready. One interviewee said, "I only partially know what stage of recovery I am in," specifically, they were unsure of the point for which they can return to normal activity, "I was told to come back at 85% recovery to start strengthening my ankle." However, it was also reported that some doctors wouldn't let the patients return until 90 to 100%. It is also common to see the patients unable to commit to the rehab process, "I went back to play sports after three weeks even though there was still some pain." This could be a result of pressure from the social environment, but also the unclear instructions from doctors made the patients unable to "trust the info given." Overall, there lacks an objective measure for the recovery process in which the patients can trust.

In addition to patients' perception, we were also told that individual unique factors affected their healing schedule. Some said the sleep is important for him, whereas others suggested taking dietary supplements; however, all seemed to agree that the individual uniqueness in the recovery process was too big to ignore, "some people are simply faster to recover and the others are slow." Previous illness and medical history can also contribute to the speed of rehab. Therefore, it is clear to see that there is a lack of record for individual health, which prohibits the current medical staff from offering truthful and accurate predictions and recommendations.

Finally, it is communicated to us that many injured athletes suffer from not only losing energy in their daily routine, but also from mental depressions. During the rehab process, the patients can be isolated and sedentary, "I felt like my morale was down with injury." As the rehab process continues, patients tend to rush through the necessary steps to come back to normal. The result could be repeated injuries and more difficulty dealing with self-esteem. Ultimately, the patients are not objectively advised on the steps that are necessary, which may cause further damage and time loss.

With the above analysis in mind, it can be concluded that both primary stakeholders suffer from a void in the current medical/rehabilitation treatment process. The doctors are in need of a better appointment schedule and individual patient information to offer quick and specific advice. The patients are in need of an objective and specific recovery schedule that they can stick to with confidence. The result from the analysis further proves our hypothesis that the current socio-technical system will need to change to fulfill the desirable outcome both parties are interested in.

User Persona

Dr. Garrett Mitchell

Age: 47

Occupation: Family Doctor

Status: Married

Location: Sandy Springs, GA

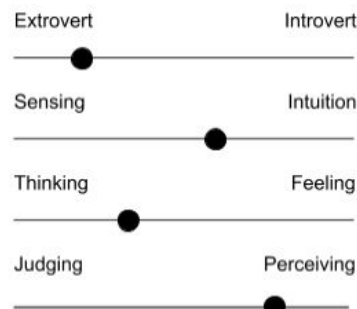
Personality: Friendly, Social



"Patients deserve help every step of the way."

Bio

Garrett is a highly experienced family doctor who cares greatly about the patient and doctor relationship. He provides the best treatment possible to his patients when possible. He has two kids of his own and enjoys helping children. Other family's kids are excited to come to the doctors to see Garrett.



Goals

- Help his patients live a healthy life
- Foster a healthy relationship with his patients
- Help patients recover quickly from illness

Frustrations

- Wants more frequent time face-to-face with patients
- Lack of insights on patients' health outside of appointments
- Sometimes needs to refer patients to other doctors specializing in certain treatments

Concerns

- Worried about patients outside of office
- Health and lifestyle of local families

Bryan Oxtan

Age: 27

Occupation: Accountant

Hobbies: Running

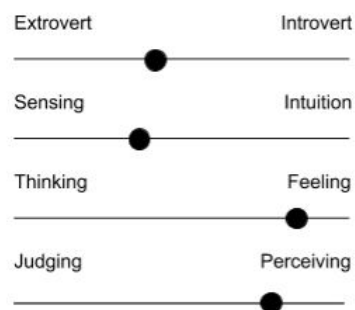
Status: Single

Location: Buckhead, GA



Bio

Bryan is an accountant working in Midtown. Every morning, he wakes up very early in order to go running in a local park for an hour before leaving for work. He enjoys running for fun and health benefits. Bryan often runs alone in order to focus on his performance and improve as much as possible.



Goals

- Eat healthy and be physically active
- Train to beat previous records at marathon
- Become one of the fastest runners in his local region

Frustrations

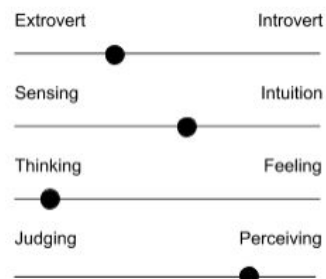
- Only free time to go running is in the morning before work
- Wishes there were more local marathons and 5Ks to compete in
- Can't run in bad weather such as thunderstorms

Concerns

- Always looking out for physical health

Laren Hill**Age:** 33**Occupation:** Realtor**Hobbies:** Music**Status:** Married**Location:** Atlanta, GA**Bio**

Lauren is a realtor in Atlanta who is passionate about working as hard as she can every day with great work ethic. She has two kids, ages 2 and 3. Lauren enjoys going for casual runs around her neighborhood with her husband after work in order to stay in shape. To Lauren, running is a social and fun exercise that helps relax her mind off of responsibilities.

**Goals**

- Build a strong family with her husband and two young kids
- Go running every day to stay physically active
- Influence kids to be healthy and active when they are older

Frustrations

- Sometimes has to skip runs in order to take care of children
- Would like to run in other places, but neighborhood is closest and most convenient

Concerns

- Other responsibilities may take precedence over running

Initial Design Implication

1. Recreational athletes who suffer from mild physical injuries that hamper mobility temporarily were interviewed and they claimed to spend most of their time recovering at home or at work/school due to a decrease in mobility and activity. Busy work/school schedules can make it difficult to follow all the rehab instructions provided by medical professionals. Therefore, the solution should be designed to be easily used in the home, at work, and at school. Designing the solution in this way will allow injured athletes to use the solution more regularly in times of convenience in the hopes of improving the rehabilitation process.
2. Injured athletes were interviewed and claimed to be unsure of where they are at in the recovery process. Often, the only indication they were able to base their progress on was their level of pain. However, the level of pain to an injury can vary daily, and this makes it difficult for an athlete to assess the progress of their recovery. This uncertainty was reported to lead to low confidence, low motivation, and cases of depression which can all lead to the athlete not following through on their recovery regimen. Therefore, the solution should be designed to allow the injured athlete to reliably assess their recovery progress on their own. Designing the solution in this way would provide the athlete with information of their recovery progress to keep confidence and motivation high in order for the athlete to follow through on their recovery regimen.
3. It was reported that injured athletes had poor experiences during their initial visit with a medical professional after suffering the injury. The first appointment often involved little face-to-face time with the doctor, and the rehab information provided to the athlete was too general. This would cause the athlete to view this appointment as a waste of time, money, and effort. Additionally, the initial visit would sometimes end with a referral to a rehabilitation specialist. Some athletes would choose not to go to the referral appointment. However, athletes who did visit the specialist felt like they received more specific information that was more helpful to their recovery process. This information would include exercises as well as a better timetable for recovery. Therefore, the solution should be designed to allow the injured athlete to easily receive the more general medical information without the need to make the initial appointment while also providing a more direct way to receive the information that would be given during a visit with a rehabilitation specialist. This design implication is meant to keep the athlete more informed about their recovery process, to encourage the athlete to seek a consultation with a specialist, and to save the athlete time and money that would have been used on the initial appointment with a general medical professional.
4. When returning to activity, injured athletes reported to still have some pain or not be 100 percent healed. Additionally, the athletes had uncertainty about their physical ability when returning and had fears of reinjury. Their decision to return to activity was self-informed. When comparing this process to that of the college athlete, the college athlete's decision to return was more guided by medical professionals. College athletes also return to activity in increments that work towards regular play. Therefore, the solution should be designed to safely guide athletes back to playing their sport. This design implication is meant to make the athlete feel safer and more confident when returning to activity as well as lowering the chances of reinjury.

Appendices

A1. Research Instruments

(a) Survey

Question	Question Type	Options (if applicable)	Mandatory Question
Age	Descriptive	-	Yes
Gender	Multiple Choice	Female, Male, Other, Prefer not to say	Yes
Have you ever suffered from a physical injury?	Multiple Choice	Yes, No	Yes
If yes, where was this injury centralized?	Descriptive	-	No
Did you visit the doctor for this injury?	Multiple Choice	Yes, No	No
How long after the injury was your visit?	Descriptive	-	No
Did you require the use of a support device? (i.e. crutches, wheelchair, etc.)	Multiple Choice	Yes, No	No
If yes, what kind of support device?	Descriptive	-	No

(b) Semi-structured interviews

We performed semi-structured interviews. We had a few basic guidelines and covered the following questions and topics. These may not have been discussed with the users in the same order.

Questions and Discussion Points with injured recreational athletes as well as friends & family of recreational athletes-

1. Can you tell me about an injury you received playing sports that prevented you from participating in physical activities for multiple weeks?
2. Did you seek medical evaluation? How soon after your injury?
3. How did the appointment go?
4. What medical advice were you given to do at home? How did you feel about it? Was there anything you were unsure about or had to learn?
5. Did you have follow up appointments? If so, how did they go? If not, why not?
6. Did you go back to your sports activity? If so, how soon? Did you have any pain or discomfort when you returned?
7. Did you feel confident about treating your own injury?
8. How did your injury impact your everyday activities?

9. What was the most challenging part about your rehab process?

Questions and Discussion Points with doctors -

1. What is your experience treating patients recovering from a physical injury that does not require surgery?
2. Do the patients diligently follow the routine suggested? Do the patients do the suggested exercises?
3. How do you ensure the patient recovers from their injury?
4. Generally, how long does it take for the recovery to happen (i.e. sprained ankle, pulled hamstring, etc.)?
5. Is it common for the patients to have follow-up appointments while recovering from injury and how regular should the follow-up appointments be?
6. Under what conditions do you recommend a patient to undergo rehab specialists?
7. Is there a higher chance to injure a part that was previously injured?
8. Do any particular types of treatments heal physical injuries faster (like homoeopathy, etc.)?
9. How soon after injury do a person generally come and visit you for treatment?
10. If a patient is not able to come back for a checkup during the recovery process, what kind of advice or recovery schedule would you give them?

A2. Other Resources in Research

Sports Injuries: When to Tough It Out

Author - Gina Kolata

The author interviews Dr. Paul D. Thompson (marathon runner & cardiologist at Hartford Hospital, Hartford) to discuss long distance running, physical injuries associated with the sport and recovery process.

URL - <https://www.nytimes.com/2010/04/01/fashion/01best.html>

Ask Dr. Furmanek: When Should I See A Sports Medicine Specialist For An Injury?

Dr. Jeffrey Furmanek (orthopedic surgeon) discusses the roles of the family doctor and the sports medicine specialist. He also explains why it is critical to talk to a sports medicine specialist for sport related injuries and lastly provides suggestions to select the correct care practitioner.

URL - <https://www.summitortho.com/2016/12/20/ask-dr-furmanek-see-sports-medicine-specialist-injury/>

Combat the Trends and Get Patients the Care they Need

Author - Daniel Dreaden, Senior Health Analyst

The author summarizes the results of multiple research studies concerning physical injuries and discusses his top 3 reasons why people don't visit the doctor in the article. The author identified cost, transportation barriers and busy schedule as the top reasons for not visiting doctors.

URL - <https://blog.stratason.com/top-3-reasons-people-dont-visit-the-doctor>

How Accurate are WebMD Results?

Author - Terry Spry Jr., Jason Puckett, David Tregde

This article analyzes the accuracy of WebMD and other symptom checking websites and discusses the trustworthiness behind the information provided by these sites.

URL -

<https://www.wkyc.com/article/news/verify/verify-how-accurate-are-webmd-results/507-d455712d-2cfd-42d1-996b-71424db6723e>

What Does a Consultation With an Orthopedic Surgeon Cost?

Author - Orange County Orthopedics

This article discusses what takes place during an orthopaedic evaluation and what kind of costs can be incurred depending on your insurance or lack thereof.

URL -

<http://www.orangecountyorthopedic.com/2015/08/what-does-a-consultation-with-an-orthopedic-surgeon-cost/>

What bugs Americans most about their doctors

The article talks about the main reasons why Americans avoid visiting doctors and the difficulties associated with regularly meeting them.

URL -

<https://www.consumerreports.org/cro/magazine/2013/06/what-bugs-you-most-about-your-doctor/index.htm>

Top 10 Most Common Sports Injuries

Author - Brian McEvoy, PT, UnityPoint Health

The author speaks about the most common physical sports injuries, impacted areas and how to recover from these injuries.

URL - <https://www.unitypoint.org/livewell/article.aspx?id=591d8cf1-1ee5-4cb3-b662-a5f21f6f13bc>

Surprising Statistics About Injuries In High School Sports

The article highlights the alarming number of physical sports injuries in high schools. It also talks about the poor health infrastructure that is available to these injured children and lack of experts monitoring their recovery process.

URL - <https://www.weinsteininjurylawyer.com/surprising-statistics-sports-injuries/>

Super Healing

Author - Julie K. Silver, M.D, Harvard Medical School

Different individuals recover from injury at different speeds. The article also sheds light on the best practices that must be adopted during the recovery process.

URL - https://www.aarp.org/health/alternative-medicine/info-11-2008/super_healing.html

Why Do Some People Heal Faster From Injuries?

Author - Michael O. Schroeder, Staff Writer

Injury recovery is dependent on the previous health condition of the individual as well as the patients' lifestyle.

URL -

<https://health.usnews.com/wellness/articles/2017-04-27/why-do-some-people-heal-faster-from-injuries>

Unleash Your Inner Wolverine: How to Develop Superhuman Healing Power

Author - Brett

People with higher testosterone recover faster from injury.

URL -

<https://www.artofmanliness.com/articles/unleash-your-inner-wolverine-how-to-develop-superhuman-healing-power/>

Checklist for Factors Affecting Wound Healing

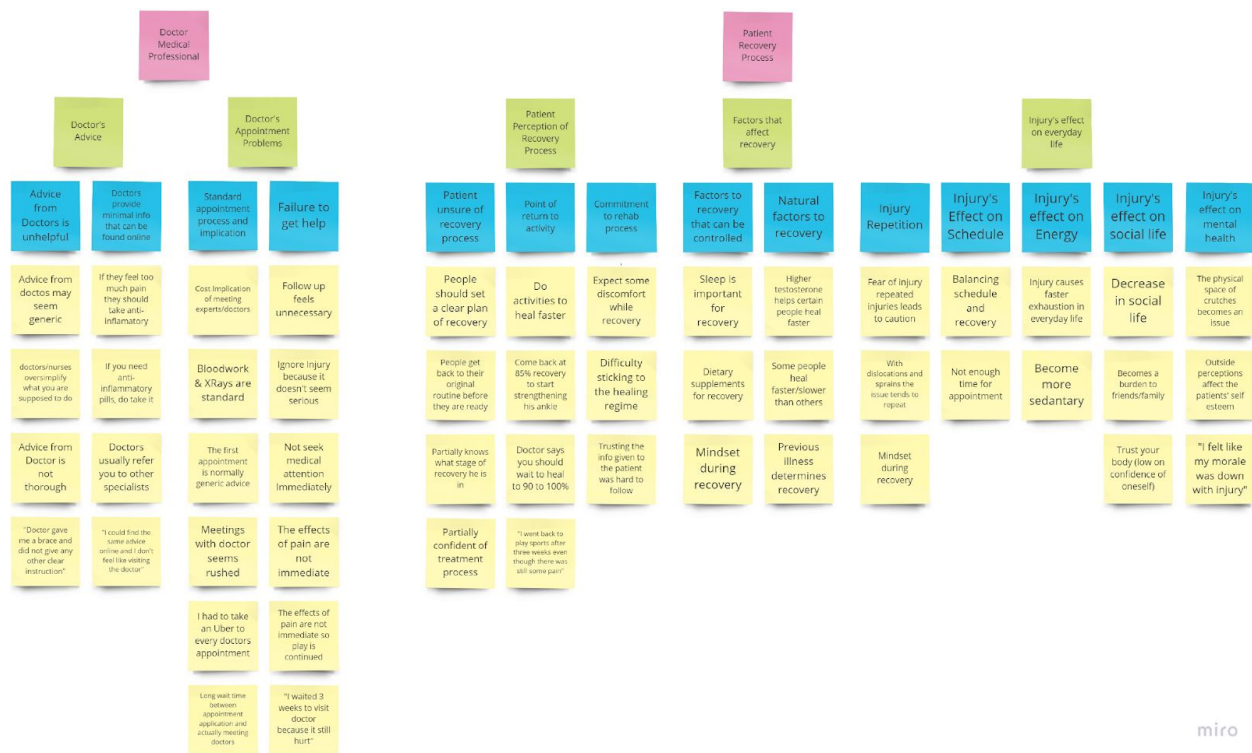
Author - Cathy Thomas Hess, BSN, RN, CWOCN, is President and Director of Clinical Operations, Wound Care Strategies Inc (WCS), Harrisburg, Pennsylvania

The author discusses the various chemical agents involved in the recovery process and how each agent impacts the recovery time.

URL -

https://journals.lww.com/aswcjournal/Fulltext/2011/04000/Checklist_for_Factors_Affecting_Wound_Healing.10.aspx

A3. Affinity Diagram



Please visit the link to view an enlarged affinity diagram - <https://bit.ly/39Qgi6K>