



# Juvenile Arthritis Sleep Tracking

Team Sleeping Manatees

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## Abstract

In this project, we asked the question: How can we help children and parents assess their Rheumatoid Arthritis (RA) symptoms and improve their sleep? We will explore this question through user research, prototyping, and design thinking. Our goal is to help families take control of a child's illness through understanding and managing sleep patterns. The final deliverable will be a high fidelity prototype, research findings, and recommendations/next steps.

We will begin with some initial and appropriate user and market research to better understand the current conditions and needs families with JIA. From that, we'll create and test a low fidelity prototype with users. We'll analyze those results and implement them into a high fidelity prototype which we will test on our users to confirm our design decisions.

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## About the Team



### Khuyen “Max” Lam

**Bio:** I have a bachelor’s degree in Anthropology, Political Science, and International Studies. I self-taught graphic arts throughout my college time, and later freelanced as a graphic designer for a few years. My passion is facilitating conversations between patients and providers through technology, and empower patients to be in control of their own narrative.

**Learning Goal:** more experience with interaction design



### Jon Anscher

**Bio:** I have many interests, making me a bit of a renaissance man, but my true passion is bringing better tools to the education sector in an effort to reform how we teach kids and adults alike. I have been a teacher, instructional designer, technical writer, and web developer. I have experience with all parts of the human centered design process, though my strength is in design thinking and facilitating the creative process. Nearly two decades of experience as a challenge course and team building facilitator has left me with a variety of skills to help with facilitating participatory design activities.

**Learning Goal:** more experience with app development



### Matt Reynolds

**Bio:** I have an undergraduate in Information Systems Security. In 2010, I took a gig working at The Boeing Company working on internal services like a corporate search engine and social network. Over the years I supported several projects like [this](#) and [this](#). Today, I spend my time leading design teams to build and support Expedia’s TravelGraph platforms. What’s a TravelGraph? It’s [like Facebook’s Social Graph](#), but for travel.

**Learning Goal:** user research and usability study process

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## Team Contract

### Team Roles and Responsibilities

| Name | Responsibilities/Roles   |
|------|--|
| Jon  | Project manager<br>Schedule and facilitate meetings<br>Track tasks in the project timeline<br>Milestone Delivery<br>Client Relationships<br><br>Technical Writer<br>Document Design and Editing<br>Content Writing<br>Editing  |
| Matt | Business Analyst<br>Competitive Analysis<br><br>Developer<br>Technical Development of the prototypes (e.g., InVision)<br>QA Testing  |
| Max  | User Researcher<br>Create Personas<br>Moderate Usability Tests<br>Contact/Scheduler for the Usability Tests<br><br>Designer<br>Prototype Development<br>Design for High Fidelity Prototype<br>Participatory Design Facilitator |

### Team Meetings

Team meetings will be held on Sunday. We will also have a weekly standing Skype call with Laura, our sponsor (date and time still to be determined). The official notetaker of the meeting will be responsible for compiling all the notes and action items. All meeting members will send their notes to that person who will collate and send to the whole group.

## Communication

Documents will be shared via Google Drive. A folder has already been created for this project and will be the sole source for all current and future documentation. The primary communication tool will be email. Skype or other web conferencing tools will be used for remote meeting attendees. Team members will respond to each other within 24 hours (including weekdays, weekends, and holidays) unless they have told the group in advance of an upcoming period of unavailability which should be shared via email and included in the project timeline.

Additionally, all team members will keep each other up-to-date on the status of their work on the timeline.

## Conflict Resolution

Team members will submit their work as per the timeline. This timeline is a living document and will be used to track progress and due dates. If a group member knows that an existing due date is no longer feasible, he or she will inform the group immediately and the team – as a majority group – will triage the situation.

If there are any disagreements over the process or the product, the team will have a discussion over the pros and cons of each side. They will give each other an opportunity to make his or her case before making any decisions. If the team cannot come to an agreement, the team will take a vote. Since there are three members, a vote should always result in a majority. If abstainments result in a tie, discussion will continue until the abstainer has resolved his or her vote.

If a team member is keeping up with his or her commitments, it is the responsibility of the other team members to honestly, but kindly explain what specific commitment has not been met, and ask the offending member what the team can do to support him or her to meeting that commitment.

If a team conflict cannot be resolved, the team will hold an “intervention meeting.” During this meeting, the team will use the principles of **Nonviolent Communication** to identify the core authentic needs of each side of the conflict. Once identify all the members authentic needs, the team will then come up with an agreement that meets all of those needs. If tensions are too high, and an agreement cannot be made, the team will seek a mediator through the class instructor.

## Purpose

Families of children with Juvenile Idiopathic Arthritis (JIA) often suffer from sleep deficiency (inadequate amount of sleep or poor quality). A first step in solving this issue is tracking and communicating sleep patterns with their provider. However, families do not have an effective method to keep track of how they are sleeping. Furthermore, because diagnosing issues can be difficult, families with JIA often find themselves thrown from one specialist to the next and can quickly become overwhelmed and frustrated by it all.

## Goal

The goal of our project is to help families of children with JIA find healthy sleeping patterns. We are attacking this problem by addressing the need to record and then succinctly view data related to sleep patterns so that kids and their parents can make better decisions about managing their illness.

Although there are many different sleep tracking tools out there, few pay attention to the bigger picture (including environmental conditions). By combining multi types of data, we hope to draw the bigger picture to help children with JIA better understand their illness.

Throughout the interviews, children and parents alike were asking for a more holistic view of the current sleep patterns within the family and how to address those. Many of the existing apps track one very specific component of sleep, but do not do a good job of capturing the entire family. Nor do they do a good job of capturing and identifying the environment and conditions that lead to that poor sleep, leaving families unable to identify the problem and find a solution for it.

## Data

Potential data includes:

- Bedtime routine and activity prior to bed
- Bedtime, wake time, and middle of the night awakenings
- Sleep duration and quality
- Environmental conditions (sound, light, temperature, etc.)
- Last food, fluid, and medications
- Symptoms (joint pain, swelling, irritability, etc.)
- Qualitative emotional data (anxiety, stress, etc.)

However, during the research phase and later in the testing phases, we will need to evaluate the data that will be most effectual balanced by how much users are willing to input. By monitoring these data points we hope to empower children, their families, and their healthcare providers to self-manage their sleep and JIA-related symptoms.

## Target Audience

Our target user will be the children with JIA, ranging in ages from 8 to 12. However, a secondary user audience will be the parents or guardians of those children as they often have an active role in helping the primary user manage his or her illness. **We are considering them a second audience much in the same way “mobile first” is used to describe a style of web design. In the interviews, many parents indicated that if an app was designed for their kids, they would use it as well. They did not see a need for a secondary design for them. Additionally, since JIA tends to affect the sleep of the whole family, it’s the JIA that is our primary target, although the entire family’s sleep is what we are trying to understand.**



## Process

Our timeline is a live document that we will use to track progress and make adjustments as necessary to the project plan (link included below). Included as **Figure 1** is a list of tasks on the timeline and their due dates. Included in **Appendix A** is the entire visual timeline.

### Timeline

**Figure 1**—Project Tasks, Responsibilities, and Due Dates

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The timeline is divided into three main milestones, the planning phase (culminating in the completion of this proposal), and the final deliverable and report out. Below the three milestones and the final deliverable are described in detail.



## Milestone 1: Competitive Analysis and Personas

**Techniques:** Market Research, User Research, Personas

**Description:** We will read through the existing interview transcripts to better understand the audience and their needs. The existing data consists of a series of 10 interview transcripts already conducted by our sponsor, Laura Pina. These interviews were conducted with children and one or both guardians. They began with questions to better understand the nature of JIA within that families and their current sleep patterns. The interview then asked what tools the family currently uses to track and manage the illness and their sleep and continues by going through a series of apps, tools, prototypes, and concepts for tracking tools from calendars to apps, to devices. We have the complete transcripts from those interviews as well as the interview protocol. Due to this illness not being highly common, and the need for our sponsor to continue working with these patients, we will build our personas off of these existing interviews in order to not overburden their audience. We will also conduct a competitive analysis of consumer and healthcare related products and services. From those we will create personas to help guide our ideation and initial prototype. Once we have the personas and competitive analysis complete, we will begin building a requirements list for the app. We will identify requirements in three categories: **must have, really want, and nice to have.**

**KPIs:** We will have 2 adult and 2 child personas. They will give a complete picture of four different main user types. They will be based on the 10 interview transcripts. We will have a competitive analysis with at least 10 other products being compared. We will have a requirements document outlining our must haves, really wants, and nice to have features based on the personas.


**Deliverables:** Competitive analysis, personas report, and requirements list

**Due Date:** 1/9/2016

## Milestone 2: Low Fidelity Prototype v1 and Usability Testing

**Techniques:** Idea Generation, Sketching, Conceptual Mapping, Wireframing, Prototyping, Usability Study.

**Description:** This goal here will be to get to a low fidelity concept built quickly so that we can get early feedback on our prototype. The low fidelity prototype will be done with a simple color scheme (perhaps grayscale) in a sketch-like format to focus on functionality. Our focus for the first usability test will be to focus on the theme and feel of the app. One of the challenges these children face that came out of the interviews is that the entire family structure centers around caring for that illness. Therefore, we will focus on a functional theme for the app that is not JIA-centric. We will test this version on 3 users in short 45-minute sessions.



**KPIs:** This prototype should have the three key interactions. It will be mockup-like in its visual design, the focus will be on the functional theme of the app. We should run tests on 3 users.

**Deliverables:** Low fidelity prototype v1, testing protocols and usability testing analysis

**Due Date:** 2/13/2016

### Milestone 3: Low Fidelity Prototype v2 and Usability Testing

**Techniques:** Iteration, Prototyping, User Research

**Description:** This will be a second “sprint.” We will adapt the low fidelity prototype based on initial user research and conduct a second test on the new prototype with 5 users. The second usability test will be focused more on all the features and the visual design and intuitive functionality.

**KPIs:** This should be a complete prototype, ready to be tested. It should have high fidelity visual design, color, and be as fully functional as possible. It will have “faked” data so that users can see what their sleep tracker would show them. We should have all the interactions planned for the final version ready to test. We should get 5 users to test this version on.

**Deliverables:** Low fidelity prototype v2, testing protocols and usability testing analysis

**Due Date:** 3/1/2016

## Final Deliverable: High Fidelity Prototype and Instructions

**Techniques:** Design, Prototyping,

**Description:** Using data from the usability tests, we will construct a higher fidelity prototype using InVision or similar tool. The high fidelity prototype will be designed as if it were a final product with color and a focus on visual design. **Additionally, we will include a design spec that will explain all the design decisions we made throughout the process so that our design can be taken to a developer and implemented.**

**KPIs:** This should be detailed enough that our sponsor can hand it off to a development team to implement this.

**Deliverables:** High fidelity prototype, log of design decisions, competitive analysis, secondary research findings, persona recommendations, and usability study analysis, project video, next steps or future recommendations.

**Due Date:** 3/13/2016