

# Pain Assessment Application

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# Objectives Today

- To provide an overview of the initial stages of the pain assessment project
- To illustrate the opportunities of working in partnership with us on a project that underpins musculoskeletal (MSK) research
- To enable interdisciplinary discussion and collaboration

# Problem to be Solved

Multiple MSK databases / registries used by Western researchers and their community clinical partners to collect data about pain and symptoms

- e.g. SPINA - developed by team of researchers, patient partners, and physiotherapists
- First international registry focused to rehabilitation for MSK spinal problems
- Similar for HULC and FKSMC



**Current data collected about pain and symptoms does not fully capture the patient experience for research projects**

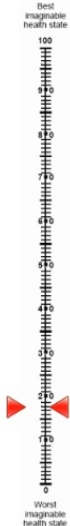
# EmPOWER Platform

Foms Email Security Sign Out

EQ-5D VAS (Self)

te is, we have drawn a scale on which the best state you can imagine is marked 100 and the worst

good or bad your own health is today, in your opinion. Please do this by clicking your mouse on the  
ouse button and drag the RED arrow to the point on the scale that indicates how good or bad your



- Operates multiple musculoskeletal registries used by Western researchers and community clinical partners (e.g., CANSpine, FKSMC, HULC)
- Accessible for patients and researchers to collect & inspect data

# Design Problem

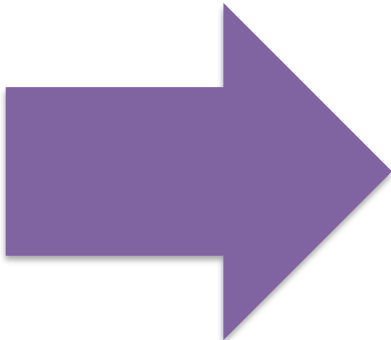
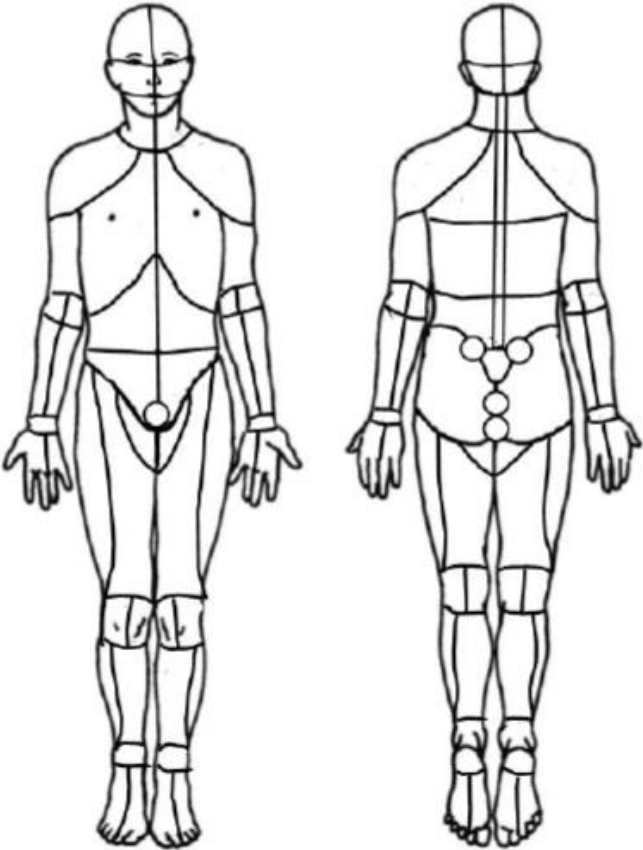
Existing pain assessment applications have considerable variation of content

More comprehensive dataset is essential for better understanding patients pain and symptom experience



Develop a central EmPOWER-based pain and symptom assessment application that can be used by researchers across various registries / databases

# Vision



The top part of the image shows a heatmap of a human torso and upper legs. A color scale on the right ranges from 0% (blue) to 100% (red). A white pointer is visible on the heatmap.

The bottom part of the image is a screenshot of a software interface titled "Pain Diagram". It features a 3D model of a human figure with colored regions indicating different types of pain or symptoms. A legend below the model identifies the colors: Red for Numbness, Blue for Pain, Yellow for PinsNeedles, and Green for Ache. The interface also includes buttons for "ZoomIn", "ZoomOut", and "Save".

## CANSpine Overview

[Researchers](#)

[Postdoctoral Fellows](#)

[Adjunct Researchers](#)

[Students](#)

[Patient Partners](#)

### Get Involved

Patients engage in all phases of CANSpine research, from identifying priority research questions to mobilizing knowledge of research results.

Interested in getting involved?

[SEND US AN EMAIL](#)

Patient partner engagement through MSK researchers e.g., for spine

## Patient Partner Advisory Group



### Patients as partners in research

Collaborating with patients as partners is vital to CANSpine. Patients meaningfully engage in all phases of CANSpine research, from identifying priority research questions to mobilizing knowledge of research results. This ensures the patient's voice informs all that we do and that CANSpine research meets the needs of patients and the community.

### Patient Partner Advisory Group

The Spinal Pain Patient Partner Advisory Group is a diverse group of people who have varied experiences with spinal pain. While active collaboration in research is a focus, a multidimensional framework of engagement provides unique opportunity to engage in numerous research and educational activities.



#### Research projects

Patients engage throughout the lifecycle of research in a variety of different research projects focused to spinal pain



#### Quality improvement initiatives

Patients improve processes and systems in CanSpine research

# Collaborative Design & Development Approach

## Patient Interface Specialist

- Liaise with patient partners and researchers to gather user needs & requirements
- Visualize the interface design

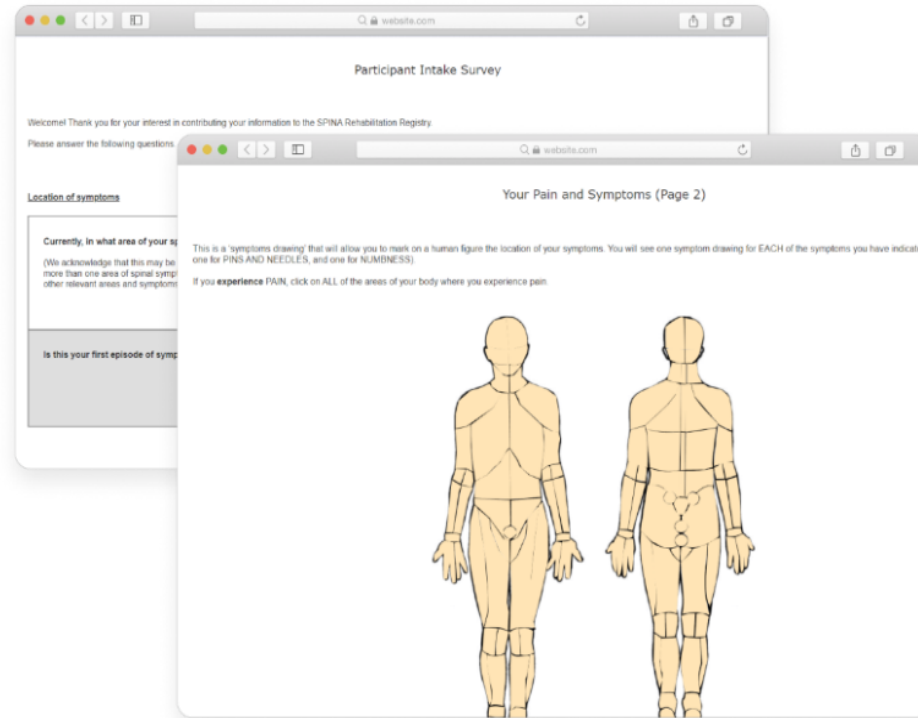


## Digital Design Specialist

- Translate patient partners and researchers' needs into technical specifications for EmPOWER
- Assist EmPOWER throughout the development process



# Assessing the Patients' Needs



**How can we better capture the pain and symptom experience?**

# Patient Partner Feedback to Guide Design

Which aspects of your pain & symptom experience could be better captured?

Multiple areas & layers of pains & symptoms have different characteristics

Change in each pain/symptom across treatments, at rest & onset, & across frequent fluctuations

Effect of emotions, other injuries, health conditions

How should we design a 3D pain & symptom assessment body chart?

A manikin design with landmarking would be helpful for mapping pain or symptom areas

A brush is better for explaining pain

Provide multiple options of learning resources for people with different preferences

# Early Exploration of the Application Design

Initial designs:

Add Your First Area of Pain or Symptom

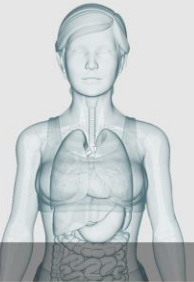
Brush Size Erase Wash Area

Send to zoom-in/out  
Click and drag to rotate

What does your pain or symptom feel like?

Pain/Symptom Area 2

Next



Add Your First Area of Pain or Symptom

Brush Size Erase Wash Area

← Your Nagging Pain

This is my first episode of this pain/symptom

What is the degree of severity of pain or symptom in this area?

0 Mild Moderate Severe

Is this pain or symptom...

Always there  
 Comes and goes

How long have you had this pain or symptom?

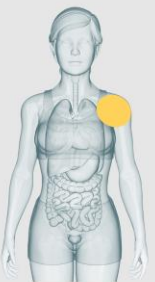
Select the length

Please mark on the 0-10 scale how much pain or symptom you have had in this area, on average, over the past week.

No pain or symptom 0 1 2 3 4 5 6 7 8 9 10 Worst pain or symptom imaginable

Is there anything else you would like to tell us about this pain or symptom?

Done



Questions about your Main Area #1: Nagging Pain

Please answer the following questions about this area of pain or symptom.

What makes your nagging pain worse?	<input type="text"/>
What makes your nagging pain better?	<input type="text"/>
Is there a time of day when you do not experience your nagging pain at all? Please check ALL that apply.	<input type="radio"/> No <input type="radio"/> Yes If YES, when? <input type="checkbox"/> Morning <input type="checkbox"/> Afternoon <input type="checkbox"/> Evening <input type="checkbox"/> Bedtime <input type="checkbox"/> Overnight
Is there a time of the day when your nagging pain gets worse? Please check ALL that apply.	<input type="radio"/> No <input type="radio"/> Yes If YES, when? <input type="checkbox"/> Morning <input type="checkbox"/> Afternoon <input type="checkbox"/> Evening <input type="checkbox"/> Bedtime <input type="checkbox"/> Overnight

# Next Steps for MSK-IF

## Further User Engagement

- Inclusion of Upper & Lower Extremity Pain Assessment

## Co-Development with EmPOWER

- Technical Integration for Data Collection



# Next Steps for Researchers

- Consult with interdisciplinary researchers to review pain and symptom content



# Strengths & Challenges

## User Engagement

+ Strong foundation from spinal patient partner advisory group

### Challenges

- Limited timeframe to receive feedback
- Recruitment from other organizations

## Technology Related

+ Well established registry and platform (SPINA & EmPOWER)

### Challenges

- Development cost
- Software integration

# Product Vision Example

System



**Researcher needs assessment in discussion with patient partners to define requirements**



**Detailed specification of 3D body chart**

**User interface developed through Empower with initial testing**

**Testing of successive versions MSK-IF/Empower**

**Patient partners involved at each stage**

**Testing of final version MSK-IF and Empower and patient partners**



# Any Questions?



# THANK YOU!

How can I seek support from MSK-IF to develop my idea further?

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Reach out to [mskif@uwo.ca](mailto:mskif@uwo.ca) if you have an idea you would like to develop further!

Please feel welcome to reach out to Dr. A. Rushton if you would like to be involved or if there is anything you would like to discuss further!