Design Thinking Pain Management: Interactive Tools That Improve Communication Between Patients and Providers

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**Purpose Statement**
Explore the role of design thinking to improve pain management communication for patients and providers. This work aims to transform pain management from a unidimensional construct to a social transaction between patients and caregivers.

**Design Thinking Framework**

1. **Empathize**
   - Understand Patient Population
     - Met with Patient and Family Advisory Committee to develop a user-centered needs assessment
     - Shadowed in surgical clinic to understand current ways providers prepaid patients for expected pain
     - Held a pain management workshop to collaborate with a large range of technical experts and gain diverse prospective on potential design
     - Conducted pain CNS shadowing to understand the challenges of pain management and the nature of pain assessments

2. **Define**
   - Define the Problem
     - Reviewed intelligent systems and applications for pain management that currently exist on the market
     - Utilized the culmination of information gathered previously to refine and delineate the problem
     - Worked with patients to understand what was most important to them when dealing with pain
     - Toggled between empathize, and define to establish what unique problems could be address in the most impactful way

3. **Ideate**
   - Think of New Solutions
     - Considered multiple device designs and lay outs to discover ideal function and addressed both staff and patients needs
     - Collaborated with patients & staff to gain design inputs
     - Revised the design to fit what the most popular choice
     - Incorporated a validated pain assessment tool into the patient interface
     - Toggled between prototyping, ideate, and defining to establish the most tool

4. **Prototype**
   - Build Real Prototypes
     - Developed early prototypes that focused on patient and provider experience
     - Created multiple iterations to enhance the functionality and patient centered focus
     - Utilized Android-based tablet and smartphone that provided a large lightweight patient display and compact nursing interface
     - Fixed bugs that presented in early testing and real-world settings

5. **Test**
   - Gather User Feedback
     - Gained institutional review board approval to conduct inpatient testing
     - Pilot tested application with 10 patients & 10 nurses as an initial proof of concept
     - Conducted a post-evaluation survey of both nurses and patients
     - Early testing indicated a robust positive response in nearly every measured question
     - Second round testing was proposed

**Conclusion**
Using design thinking methodology, we developed and tested a novel pain management communication application. Our data demonstrates that patients and nurses were able to communicate pain needs through the use of a novel application. Future studies will assess the concomitant changes in care delivery.