Addressing Chronic Pain through Patient- and Clinician-facing Clinical Decision Support

January 15, 2020, 2-3pm ET

Featuring:

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Barry H. Blumenfeld, MD, MS, Senior Physician Informaticist, RTI International

and

Kristen E. Miller, DrPH, CPPS, National Center for Human Factors in Healthcare, MedStar Health
Agenda

- Welcome – Joshua Richardson, PhD, MS, MLIS

- **AHRQ Perspective** – Roland Gamache, PhD, MBA, FAMIA

- **Shareable Clinical Decision Support for Chronic Pain Management to Promote Shared Decision-Making (CDS4CPM)** – Barry Blumenfeld, MD, MS

- **Clinical Decision Support (CDS) for Chronic Pain Management** – Kristen Miller, DrPH, CPPS

- Question and Answer Session
Share comments and ask questions

... to ask a question or comment during the presentation...
AHRQ CDS Initiative (2016 - )

Advancing evidence into practice through CDS and making CDS more shareable, standards-based and publicly-available

1. Engaging a stakeholder community
2. Creating prototype infrastructure for sharing CDS and developing CDS
3. Advancing CDS through grant-funded research
4. Evaluating the overall initiative

http://cds.ahrq.gov
Pain Management Dashboard

Historical Pain-related Treatments (6)

- Opioid Medications
- Non-Opioid Medications
- Non-Pharmacologic Treatments
The purpose is to develop, implement, disseminate, and evaluate CDS for both patients and clinicians in the area of chronic pain management.

AHRQ developed and generated interest in CDS that:

- Is interoperable and publicly-shareable
- Meets the needs of both patients and clinicians
  - Through both
    - patient-facing channels and formats
    - clinician-facing channels and formats
- Has demonstrable impact
  - Can be evaluated using appropriate measures and outcomes
  - Share lessons learned through presentations and publications
Individual Project Goals

RTI

- Develop, implement, and disseminate two types of CDS for chronic pain management:
  - Patient-facing CDS - MyPAIN and
  - Clinician-facing CDS - PainManager
- For both types of CDS
  - Develop implementation guides and reusable, shareable CDS knowledge artifacts suitable for public posting on CDS Connect or other platforms to be identified by AHRQ
  - Perform an evaluation of the CDS, including assessing impact and lessons learned during the development, implementation, and dissemination

MedStar

- Focus on non-pain management specialists in primary care
- Optimizing pain therapy and support opioid-dose reductions
- Patient-facing CDS
  - Track and management pain and daily function to support reduced opioid use
  - Support continued patient engagement
- Clinician-facing CDS
  - Detect patients at high risk of harm from opioids
  - Provide personalized evidence-based guidelines to support opioid tapering
  - Optimize presentation of patient data
- Three phase implementation at 15 primary care practices
- RE-AIM framework to assess implementation and evaluate outcomes
Shareable Clinical Decision Support for Chronic Pain Management to Promote Shared Decision-Making (CDS4CPM)

Barry Blumenfeld, MD, MS – RTI Project Director

Additional RTI Team Members: Joshua Richardson, PhD, MS, MLIS; Laura Marcial, PhD; Stephanie Rizk, MS; MS, MM-CI; Jessica DeFrank, PhD, MPH; Mark Edlund, MD, PhD; Sara Jacobs, PhD; Lauren McCormack, PhD; Sonya Goode, MS
The PCCDS Learning Network (LN) Informed CDS for Chronic Pain Management (CDS4CPM)

**CDS Analytic Framework for Action (AFA)**

- Qualified Patient-Centered CDS (PCCDS) as a solution to deliver PCOR findings—and more broadly—patient-centered evidence
- Provided a unifying descriptive framework for the PCCDS lifecycle
- Placed PCCDS within the context of an ecosystem that promotes system-level learning
Requirements to promote *action* in shareable PCCDS for pain management and opioids

Attributes and recommendations for building *trust* in shareable PCCDS

Consensus *draft standards* for sharable PCCDS

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LN Workgroups Described Key Components of Shareable and Patient-facing CDS

Patient-Facing CDS WG (PFWG)
A patient and developer led volunteer workgroup identified key themes for patient-facing CDS for pain management:

- **Plan:** Set goals (both personal and clinical) and associated integrated care plan based on circumstances, preferences, values, and goals in the context of shared decision making

- **Communicate:** Enable seamless multidirectional communication between medical and lay teams

- **Adjust:** Record, manage, track, evaluate and prioritize to adjust integrated care plan and personal and clinical outcomes

- **Support:** Engage medical, peer, and community support for the integrated care plan
Challenges with Shared Decision-Making (SDM) for Chronic Pain Management

- Chronic pain affects as many as 1 in 3 American adults that significantly disrupts everyday life\(^1,2\)
- Annual costs due to chronic pain are as much as $630 \textit{billion}\(^3\)
- Over half of patients with chronic pain receive care in primary settings\(^4\)
- CDC highlights shared decision making (SDM) as a key strategy for providers to educate patients about treatment options, including opioids\(^5,6\)
- SDM coupled with supplementary materials can align treatment plans with patient values and preferences\(^7\)
- INSPIRE Trial is gaining insights into SDM challenges related to opioid titration
AHRQ’s SHARE Framework for SDM and Shareable CDS

A. Communicate
- Seek your patient's participation

B. Educate
- Provide details on treatment options

C. Preferences
- Collect your patient's values and preferences

D. Discuss and Decide
- Discuss options and decide with your patient

E. Evaluate
- Evaluate your patient's decision
AHRQ’s SHARE Framework for SDM and Shareable CDS

MyPAIN for Chronic Pain
- PROM based Pain Assessment
- Non-Opioid Treatment Options
- Information on Opioids
- Pre-visit assessment Questionnaire

PainManager Dashboard
- Results from MyPAIN to facilitate SDM
- Pertinent Patient History
- Historical Treatments and Risk conditions
- PDMP data
- Structure note Generation for SDM

A. Communicate
• Seek your patient’s participation

B. Educate
• Provide details on treatment options

C. Preferences
• Collect your patient’s values and preferences

D. Discuss and Decide
• Discuss options and decide with your patient

E. Evaluate
• Evaluate your patient’s decision
MyPAIN: Patient-facing CDS

Portal sends invite to MyPAIN

Patient accepts invite

Portal gives access to MyPAIN

MyPAIN user interface being built de novo
PainManager: Clinician-facing CDS

EHR notifies that MyPAIN data are in PainManager

Provider accesses PainManager in EHR

PainManager displays data and SDM resources

Provider writes SDM evaluation in PainManager

PainManager user interface being built from the existing Pain Management Dashboard
PainManager: Clinician-facing CDS

Factors to Consider in Managing Chronic Pain

TAKEN NOTICE: This summary is not intended for patients who are undergoing end-of-life care (hospice or palliative) or active cancer treatment.

Pertinent Medical History
- Conditions Associated with Chronic Pain
- Risk Factors for Opioid-related Harms

Historical Pain-related Treatments
- Prescription Drug Monitoring Program (PDMP)
- Shared Decision Making

Brenda Jackson
63 YRS FEMALE

Total Entries: 12
Total Flags: 11
CDS4CPM Team, Timeline, and Activities
Site Leads

University of Chicago Medicine

Craig Umscheid, MD, MS
Director, Center for Healthcare Delivery Science and Innovation
Co-PI

Cheng-Kai Kao, MD
Associate CMIO
Co-PI

Vanderbilt University Medical Center

Asli Ozdas Weitkamp, PhD
Director, Clinical Decision Support and Knowledge Engineering
Co-PI

S. Trent Rosenbloom, MD, MPH
Associate Professor, Department of Biomedical Informatics
Co-PI
The Design Process

Timeline

Overview

- Technical Considerations
- Gather Requirements
- Content Selection

Brainstorming Sessions

Months 2-3

Design UI/UX

- MyPAIN
- PainManager

Design Specification

Month 4

System Specification

Details

- Discuss Technical Approach
- Ideal SDM and other Content
- Design Ideas
- UI/UX
- Other Reqs (e.g., PDMP)

Specification
Managing Multi-Site Development and Implementation

- Management of multi-site development and implementation
  - **MyPAIN** and **PainManager** teams will kick off together, but development will then bifurcate for the two user interfaces, with RTI and Technical Partners coordinating
  - Technical Partners will lead the initial development for both apps, but they will be localized independently at the two sites
## AHRQ Action III: Draft High-Level Timeline for CDS for Pain Management

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*Checkpoint month 15

*Evaluate and possibly take down for refresh at checkpoint in Month 15
Evaluating the Development, Implementation, and Use

- **Consolidated Framework for Implementation Research for Process Redesign (PR Framework)**
  - Domains align with RE-AIM and Normalization Process Theory
  - Replicable and practical
  - Focuses attention on successes and failures

- **Determining constructs for QUAL and QUANT evaluation**
## Evaluation Candidate Measures

<table>
<thead>
<tr>
<th>Domain</th>
<th>Construct</th>
<th>Candidate Measure</th>
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<tr>
<td>Intervention Characteristics</td>
<td>Adaptability</td>
<td>• Qualitative: providers’ perceptions of the CDS on workflow</td>
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<tr>
<td>Outer Setting</td>
<td>Technological environment</td>
<td>• Qualitative: administrative leaders’ perceptions about budgeting IT that includes shareable CDS</td>
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<td>Inner Setting</td>
<td>Access to information, training, education</td>
<td>• Qualitative: providers’ experiences using (or not using) PainManager</td>
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<td>• Quantitative: number of PainManager sessions</td>
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<tr>
<td>Individual/Team</td>
<td>Self-efficacy</td>
<td>• Qualitative: the degree to which providers felt they could trust the process for SDM using MyPAIN and PainManager</td>
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<tr>
<td>Process of Implementation</td>
<td>Engaging</td>
<td>• Qualitative: the degree to which providers felt included in the implementation of MyPAIN and PainManager</td>
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<td>• Quantitative: number of support calls to extend access to clinic staff, e.g., nurses, assistants</td>
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<tr>
<td>Measures of Implementation</td>
<td>Reach within the organization</td>
<td>• Quantitative: absolute number, proportion, and representativeness of individuals that participate over time</td>
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<tr>
<td>Outcomes</td>
<td>Provider experience Effectiveness</td>
<td>• Qualitative: providers’ and administrators’ overall opinions of MyPAIN and PainManager</td>
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<td></td>
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<td>• Quantitative: proportions of unique patients accessing MyPAIN and completing sessions</td>
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<td>• Quantitative: proportion of SDM sessions that providers report in PainManager</td>
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<td>• Quantitative: count of views of PDMP data</td>
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Key Challenges to Date & Anticipated Challenges

- **Strategic**
  - Arriving at an effective decision rubric for deciding what functions and content to incorporate
  - Optimizing inputs from multiple stakeholders and perspectives

- **Legal/Ethical**
  - Licensing content
  - Building one PDMP solution across two state regulatory environments

- **Technical**
  - Applying SMART on FHIR and CDS Hooks solutions to systems that have not (yet) adopted
  - Operationalizing the phenotype to be used across two organizations
  - Generally finding balance between CDS/EHR standards-based and non-standards-based solutions
Next Steps

- Continued to build out in subteam meetings to specify design requirements for all system components
  - Patient identification phenotype (query to trigger MyPain invitation)
  - Confirming standards for value sets, FHIR resources, and more
  - MyPAIN assessments integration
  - Writing MyPAIN and PainManager data “to the record”
  - Determining PDMP data import mechanisms
  - Finalizing user interface design decisions
- Writing the testing plan
- Drafting the evaluation plan
We are building patient- and clinician-facing CDS to promote SDM for chronic pain management

We are facing challenges to writing from SMART on FHIR apps to local EHRs/portals

Tackling challenges to integrating PDMP data into SMART on FHIR apps

Seeking balance between standards-based approaches and site-specific constraints
Clinical Decision Support (CDS) for Chronic Pain Management

Principal Investigators: Kristen Miller, DrPH, CPPS & Aaron Zachary Hettinger, MD, MS
Project Manager: Robin Littlejohn, MS, AEP

MedStar Team Members: Raj Ratwani, PhD, Jim Houston, MD, Elias Shaya, MD, Peter Basch, MD, Bonnie Levin, PharmD, MBA, FASHP, Kathryn Walker, PharmD, Ella Franklin, MSN, RN, EDAC, Adam Krukas, PharmD, MSHI, GCQHS, Joseph Blumenthal, Shrey Mathur, MS, Shrenik Shah, MS, John Erkus, Peter Keuhl, MD, Deliya Wesley, MPH, PhD, Sadaf Kazi, PhD, Kelly Smith, PhD, Nawar Shara, PhD, Ram Dixit, MS, Christine Laccay, MHA, PMP, Ronald Romero Barrientos, Christian Boxley, Deanna Busog

Collaborators: Perk Health, Georgetown University Medical Center, George Washington University, IMPAQ International

Consultants: Alan Staples, II, CRCR, Ross Teague, PhD, Ranit Mishori, MD, MHS
Focus: Non-pain management specialists in primary care

Rationale:
- Chronic pain is the second most common reason for outpatient primary care visits (IOM, 2011)
- Treatment and clinical management is a challenge currently faced by primary care providers (Schneiderhan et al, 2017)
- Optimal pain management requires clinicians create individualized treatment plans (HHS, 2019)
- Barriers include challenging and exhausting communications, inadequate resources, and lack of training (Penney et al, 2017)
Target: Opioid Tapering

Rationale: Over the last 20 years, the liberal prescribing of opioids for chronic pain has created a population of patients who have been on long term opioid therapy for several years, if not decades (Clark et al, 2016)

- Long-term opioid use linked to physical dependence, increased pain over time, constipation and nausea, depression...
- Patients may be reluctant to taper fearing withdrawal and increased pain
- Clinicians must assess and weigh risks versus benefits to decide whether tapering is indicated
- Tapering plans should be individualized (minimize symptoms of opioid withdrawal, maximize pain treatment with nonpharmacologic therapies and nonopioid medications)
Optimize pain therapy and support opioid-dose reductions

Clinician-facing CDS
- Display patients at high risk of harm from opioids
- Provide personalized evidence-based guidelines to support opioid tapering
- Optimize presentation of patient data

Patient-facing CDS
- Track and manage pain and daily function to support reduced opioid use
- Support continued patient engagement

Three phase implementation at 15 primary care practices

RE-AIM framework to assess implementation and evaluate outcomes
Application of Human Factors Engineering Methods

- **Stakeholder interviews**
  - Patients with chronic pain
  - Family members of patients with chronic pain
  - Health IT developers focused on patient-facing technologies

- **Workflow analysis**
  - Evaluate current state of patient-provider interaction to develop site-specific process maps of the overall process and elements for CDS implementation

- **Application of user-centered design principles**
  - Design and development

- **Usability testing**
  - Evaluate preference and performance to assess usability
Technical Approach

Application Development

- HL7 Standards (e.g., FHIR, CDS Hooks)
- SMART
- OpenID Connect specification (control patient privacy)
- Clinical Quality Language (CQL) to create a L3 CDS knowledge artifact
Patient-Facing Technology

Scientific Discovery

Use cases

Persona development

Journey mapping

Storyboarding
Use Cases

A unique instance of sharing a specific type of information regarding patients and their health. Each use case has a specific purpose, type of data exchanged, and rules for interactions between people and systems.

SAMPLE USE CASE

25 yo with overdose event after abusing oxycodone after getting addicted after wisdom tooth extraction. Wants to be tapered off the oxycodone, finds app in Apple Store and inquires with PCP to work on a taper.

- **Who is the user**: PCP, Patient
- **User goal**: Get patient started on a taper interfacing with app technology
- **The steps the user takes to accomplish a particular task**: Guide PCP discussion on what to expect with withdrawal and alternative pain management methods.
- **How technology should respond to an action**: Guide clinician through discussion and provide useful, patient centered, customizable engagement and tracking mechanism for the patient taper plan.
Persona Development

A fictional representation of an actual user, *based on data collected from potential end-users*, applied in the early stages of product development or product redesign. They provide the team with a shared understanding of users in terms of goals and needs.
Persona Development

**Behavior Based Personas:** use behavior attributes that are personality traits that focus on behavior and motivation. More actionable.

The emotional state of end users has a profound impact on their ability to use technology…

**SAMPLE BEHAVIOR BASED PERSONA**

- Technology savviness vs novice
- Micromanaging approach versus hands-off approach
Journey Mapping

Visualization of the process that a person goes through in order to accomplish a goal. Common user experience tool. Often exposure pain points and opportunities for improvement in many other areas along the entire user journey.

Image credit: m_academian
Patient-Facing Technology

- Capture patient-reported outcome data
- Data visualization to convey risk and benefits of current therapy
- Recommendations for improved health through clinician engagement
Patient-Reported Outcomes

- The ability to routinely assess patients’ responses to pain-related treatments through the use of patient-reported outcome (PRO) assessments is critically important.

- National guidelines and experts have called for the assessment of pain-related functioning in addition to pain intensity to determine whether patients are benefitting sufficiently to merit the use of opioid treatment.

- The use of pain-related PROs is not embedded into routine clinical practice or coordinated with EHRs.

Owen-Smith et al, 2018
Data Visualization of PROs

- PROs can inform patient management but for data to be useful in clinical practice, patients and clinicians need to understand what the scores mean.
- Graphic display of PROs promotes patient-centered care.
- Best practices for displaying PRO data graphically are not established.
- Patient’s age and education have been shown to impact accuracy.
- Clinicians and patients differ in their preferences for details included on graphics.

*Bantug et al, 2015*
Data Visualization to Convey Risk/Benefits

- Visualization – through its numerous cognitive and communicative advantages – can play an important role in assessing and conveying risks.

- Many patients are not risk literate and are biased by common risk communication practices. Numeracy and graphical literacy skills may affect the efficacy of visual aids.  
  
  Garcia-Retamero et al, 2013
Recommendations/ Clinician Engagement

Engage with the patient during pain management optimization

- Provide patient-specific information about opioid tapering
- Guide patients to non-opioid alternatives
- Create a communication platform for the patient with the care team

Appropriately guide the patient with evidence-based recommendations (e.g., real-time ongoing coaching versus single education)
Challenges to Date & Anticipated Challenges

- Ethical, legal, policy challenges
  - Escalation protocol
  - Legal liability
  - Security of patient-facing applications (HIPAA)

- Technical challenges
  - Local EHR customizations may be required for vendor sites that have not adopted current FHIR standards
  - CDS Hooks is not yet implemented in most EHRs
  - Not all the desired data can easily and consistently be found in the FHIR resources (or may be documented in multiple places)
  - Varying EHR vendor whitelisting requirements for applications
Next Steps

- **Technical Integration**
  - App specifications, integration requirements, functional requirements, and use case models
  - Includes hub integration representing bi-directional information exchange between the patient-facing and clinician-facing apps

- **Implementation Strategy**
  - Workflow optimization
  - Implementation guide development

- **Implementation and Evaluation**
  - Three phase roll-out to 15 primary care sites representing 3 different EHR vendors

- **Dissemination**
Questions and Discussion


Thank you!

Contact Information:

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- Kristen E. Miller, MedStar Health: Kristen.E.Miller@medstar.net