The Uses of CDS in the Opioid Crisis

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Past research grant funding from Pfizer, Inc. related to chronic pain.
Outline

▪ Three takeaways

▪ Background

▪ Research findings and CDS designs

▪ Three takeaways
Takeaways

▪ Make CDS easy, convenient, and relevant for clinicians & patients.

▪ Design and implement CDS faster.

▪ Make sure CDS actually works.
How to overcome the enormous primary care challenge of relieving chronic pain while keeping patients and the public safe from opioid-related risks?

Institute of Medicine 2011
Background

- 100+ million Americans with chronic pain
- Pain costs ~$600 billion annually
- Tens of million misuse opioids
- Millions have opioid use disorder
- 72,000 drug overdose deaths in 2017

Sources: Gaskin 2012; IOM 2011; Han et al. 2017, CDC
Background

• 28,000+ patients per pain specialist (IOM 2011)

• Information Chaos (Beasley et al. 2011)
  ▪ Information overload
  ▪ Information underload
  ▪ Information scatter
  ▪ Erroneous information
“I would say the vast majority of people I think I get a good feel for it. But I’ve been snagged so many times. I could have sworn this person was being straight with me [in reporting their pain]. ...

I would imagine you’re not 100 percent right all the time. ...

So sometimes you’re probably erring in ... not giving somebody pain medications when they truly do need it. And you’re gonna err sometimes in giving patients medications when they don’t need it.”

Source: Harle et al. 2015
"I did a couple of urine screens and things like that. I was a little uncomfortable, **but she was a patient for a long time.** ... If I didn’t give her pain medicine, she’d end up in the emergency room. Anyway, just recently I found out that she came into the hospital and she was positive for cocaine a couple of times. I was like, oh. You know, sometimes I don’t know how to manage them effectively ... 

**I mean she's been my patient a really long time. We've kind of been through a lot of things together.**”

Source: Harle et al. 2015
“I did a couple of urine screens and things like that. I was a little uncomfortable, but she was a patient for a long time. ... If I didn’t give her pain medicine, she’d end up in the emergency room. Anyway, just recently I found out that she came into the hospital and they were positive for cocaine a couple of times. I was like, oh. You know, sometimes I don’t know how to manage them effectively...

How can we help clinicians make sense of patients in this environment?

Source: Harle et al. 2015
Research objectives

- To identify information needs and decision requirements for assessing, diagnosing, and treating chronic noncancer musculoskeletal pain in primary care.

- To develop prototypes for user-centered clinical decision support in electronic health records (EHRs).
User-centered decision support

Designed “... based upon an explicit understanding of users, tasks, and environments; is driven and refined by user-centered evaluation; and addresses the whole user experience, including user needs, value, abilities, limitations, and organizational goals and objectives.”
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Design, setting, and sample

- Qualitative observational study
- 3 health systems in the Midwest United States
- 12 primary care clinics
- Urban and rural
- EHRs: G3 (Homegrown), Epic, GE Centricity, Cerner
- Primary care visits by patients with chronic noncancer musculoskeletal pain
Translation to decision support prototypes

1. Critical Decision Method interviews

2. Thematic analysis and prioritization to identify key decision requirements for chronic pain care

3. Multidisciplinary design workshop

   - Refined decision requirements; information needs
   - Design seeds
   - Decision support sketches

4. High-fidelity interactive prototypes
22 primary care clinicians
  ▪ 11 male, 11 female
  ▪ 2 – 34 years in practice (mean 14)
  ▪ 18 Physicians, 2 NPs, 1 PhD, 1 LCSW

93 primary care clinician interviews
  ▪ 63% female, 38% male
  ▪ 26 – 91 years old (mean 56)
  ▪ 67% White, 33% Black/African-American
“It would be super nice if INSPECT [PDMP] available just in the EMR because, I mean, INSPECT is a great thing, and I wish that I had more time to use it, but the fact that I'm the only one that can log in and it's you know kind of time consuming and cumbersome to put all the patient's information in...

if it's one more thing that you have to do, you tend to not to do it.”
One physician described a situation where upon reviewing the patient’s history in the EHR they

“saw hydrochlorothiazide last night or early this morning when I was looking at it and when I look at the printout, it's not there. So, I don't know if they removed it... when the nurse was doing the interview, but it took me five minutes to individually go through the 20 or 30 medications that are here because there's no hierarchy. It's alphabet... Well, it's not even alphabetical actually.”
“If we had one sheet or something that wrapped all these things together. if I had a sheet that showed me last INSPECT [PDMP], this date, good. Last UDS, done. ... last imaging of their x-ray of the area that’s involved, last physical therapy visit. If I had shots to their knees. If I had a summary of the things we're having to process in one sheet, someone has already looked up the UDS for me, somebody has already looked up the last INSPECT and we're good, it would be a glance... physical therapy last done. Shots...never. Orthopedic, last visit, done. Surgery offered, yes/no/declined. ... Reasons why they could not use alternative medications.... because the information is there electronically, it’s just that I have to fight to get it, one by one... ”
Results - key decision requirements

1. Safely and efficiently manage chronic opioids
2. Understand current treatment plan, medications
3. Identify treatment options
4. Manage cases involving physical/mental health co-morbidities
5. Manage cases involving unmet social needs (e.g., housing, transportation)
## Results - Information needs

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medications</strong></td>
<td>Past and current medications relevant to pain</td>
</tr>
<tr>
<td><strong>Urine drug screen results</strong></td>
<td>Date and results of most recent urine drug screen; interpretation of results</td>
</tr>
<tr>
<td><strong>PDMP results</strong></td>
<td>Date and report of controlled substances dispensed; Interpretation of results</td>
</tr>
<tr>
<td><strong>Imaging</strong></td>
<td>Recent imaging related to pain; organized by body part</td>
</tr>
<tr>
<td><strong>Specialty utilization</strong></td>
<td>Referrals to pain-related specialist; recent specialist appointments; missed appointments/referrals</td>
</tr>
<tr>
<td><strong>Outcomes and goals</strong></td>
<td>Current pain-related health outcomes</td>
</tr>
<tr>
<td><strong>Treatment options</strong></td>
<td>Listing of pain treatment options</td>
</tr>
<tr>
<td><strong>Social determinants</strong></td>
<td>Insurance status, transportation options, housing, food access, and patients’ preferred language</td>
</tr>
</tbody>
</table>
Past and current medications
Chronic Pain OneSheet prototype

Test, Patient
Male, 29y, 5/9/1989

MRN: 000000001
Case No.: 99992348
Bed: none
PCP: Test, Doctor, D.O.
Insurance: Anthem BCBS
Language: English
Height: 72.5” (184.2 cm)
Weight: 174.0 lb (78.9 kg)
BMI: 23.3
Allergies: Bad Science
Adv Dir: None on file

Chronic Pain OneSheet

Pain-Related Diagnoses
Patient has the following qualifying diagnoses
Chronic pain (G89.29)
Chronic foot pain (M79.673)
Pain in joint, ankle and foot (M25.579)

Current Opioid/Benzo Rx
Prescription medications as of 10/16/18
ALPRAZolam (Xanax) 0.25mg tab
1 tab by mouth 3 times per day as needed for anxiety
HYDROcodone-acetaminophen 325mg tab
1 tab by mouth every 6h as needed for pain

Current Nalox/Suboxone Rx
Prescription medications as of 10/16/18
No qualifying medications

Past Opioid/Benzo Rx
Discontinued prescription medications as of 10/16/18
HYDROcodone-acetaminophen 500mg tab (disc. 3/15/17)
HYDROcodone 325mg tab (disc. 9/5/16)

PDMP Access

Default Orders
Ambulatory referral to integrative pain
Ambulatory referral to physical therapy
Drug screen, pain management, urine
Urine toxicology confirmation, opiates

Chronic Pain Summary
Open Summary (more data may exist)

Chronic Pain Labs
No data to display
Chronic Pain Meds
No qualifying medications

Use, Abuse, & Overdose Hx
Patient has the following qualifying diagnoses
No qualifying diagnoses

Urine Drug Screen Results
Lab resulted components
Amphetamine, urine NEG (8/1/18)
Hydrocodone, urine POS (8/1/18)

UDS, PDMP, risk information
**Chronic Pain OneSheet prototype**

**Test, Patient**

**Male, 29y, 5/9/1989**

**MRN:** 000000001  
**Case No.:** 99992348  
**PCP:** Test, Doctor, D.O.  
**Insurance:** Anthem BCBS  
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**Height:** 72.5" (184.2 cm)  
**Weight:** 174.0 lb (78.9 kg)  
**BMI:** 23.3  
**Allergies:** Bad Science  
**Adv Dir:** None on file

**Notes**

- **Pain-Related Diagnoses**
  - Patient has the following qualifying diagnoses
    - Chronic pain (G89.29)
    - Chronic foot pain (M79.673)
    - Pain in joint, ankle and foot (M25.579)

- **Current Opioid/Benzo Rx**
  - Prescription medications as of 10/16/18
    - ALPRAZolam (Xanax) 0.25mg tab  
    - 1 tab by mouth 3 times per day as needed for anxiety
    - HYDROcodone-acetaminophen 325mg tab  
    - 1 tab by mouth every 6h as needed for pain

- **Current Nalox/Suboxone Rx**
  - No qualifying medications

- **Past Opioid/Benzo Rx**
  - Discontinued prescription medications as of 10/16/18
    - HYDROcodone-acetaminophen 500mg tab  
    - (disc. 3/15/17)
    - HYDROcodone 325mg tab  
    - (disc. 9/5/16)

**PDMP Check**

- **PDMP Access**
  - Link to PDMP

**Default Orders**

- **Ambulatory referral to integrative pain**
- **Ambulatory referral to physical therapy**
- **Drug screen, pain management, urine**
- **Urine toxicology confirmation, opiates**

**Chronic Pain Summary**

- **Open Summary** (more data may exist)
  - **Chronic Pain Labs**
    - No data to display
  - **Chronic Pain Meds**
    - HYDROcodone-acetaminophen 325mg tab

**Use, Abuse, & Overdose Hx**

- **Patient has the following qualifying diagnoses**
  - No qualifying diagnoses

**Urine Drug Screen Results**

- **Lab resulted components**
  - Amphetamine, urine: **NEG (8/1/18)**
  - Hydrocodone, urine: **POS (8/1/18)**

**Default orders**
## Chronic Pain OneSheet

### Patient Information

**MRN:** 00000001  
**Case No.:** 99992348  
**Insurance:** Anthem BCBS  
**Height:** 72.5" (184.2 cm)  
**Weight:** 174.0 lb (78.9 kg)  
**BMI:** 23.3  
**Language:** English  
**Allergies:** Bad Science  
**Adv Dir:** None on file

### Medical History

**Sex:** Male  
**Age:** 29  
**DOB:** 5/9/1989  
**Address:**  
**PCP:** Test, Doctor, D.O.  
**Insurance:** Anthem BCBS  
**Language:** English

### Treatment Tracker

#### Medications (oral)

<table>
<thead>
<tr>
<th>Medication</th>
<th>Current Status</th>
<th>Past Status</th>
<th>Ruled Out</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSAIDs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALPRAZolam (Xanax) 0.25mg tab</td>
<td>No benefit @ therapeutic dose</td>
<td></td>
<td>Contraindication</td>
</tr>
<tr>
<td>Hydrocodone-acetaminophen 325mg tab</td>
<td>Side effects @ therapeutic dose</td>
<td></td>
<td>Patient Refusal</td>
</tr>
<tr>
<td><strong>Acetaminophen</strong></td>
<td>No benefit @ therapeutic dose</td>
<td>Side effects @ therapeutic dose</td>
<td></td>
</tr>
<tr>
<td><strong>Topical Anesthetics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lidocaine</td>
<td>Side effects @ therapeutic dose</td>
<td>Lack of patient adherence</td>
<td></td>
</tr>
<tr>
<td><strong>NSAID</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Pain-Related Diagnoses

Patient has the following qualifying diagnoses:
- Chronic pain (G89.29)
- Chronic foot pain (M79.673)
- Pain in joint, ankle and foot (M25.579)

### Current Opioid/Benzo Rx

- Prescription medications as of 10/16/18:
  - ALPRAZolam (Xanax) 0.25mg tab
  - Hydrocodone-acetaminophen 325mg tab
- 1 tab by mouth 3x times per day as needed for anxiety
- 1 tab by mouth every 6h as needed for pain

### Current Nalox/Suboxone Rx

- No qualifying medications

### Past Opioid/Benzo Rx

- Discontinued prescription medications as of 10/16/18:
  - Hydrocodone-acetaminophen 500mg tab (disc. 3/15/17)
  - Hydrocodone 325mg tab (disc. 9/5/16)

### Treatment options
Chronic Pain OneSheet prototype

Test, Patient
Male, 29y, 5/9/1989

MRN: 000000001
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Height: 72.5" (184.2 cm)
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Allergies: Bad Science
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Chart Review
HIE
CommonCare
Notes
Orders
Flowsheets
Care Plan
Discharge
Chronic Pain OneSheet

Current Opioid/Benzo Rx
Past Opioid/Benzo Rx
Prescription medications as of 10/16/18
Current Nalox/Subox Rx
Prescription medications as of 10/16/18
Discontinued prescription medications as of 10/16/18
No qualifying medications

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1 tab by mouth 3xtimes per day as needed for anxiety
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HYDROcodone - acetaminophen 500mg tab
(disc. 3/15/17)
HYDROcodone 325mg tab
(disc. 9/5/16)

Chronic Pain Summary
Outcomes and goals
### Chronic Pain OneSheet

**Test, Patient**

- **MRN:** 00000001
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**Medical History**

- **Current Opioid/Benzo Rx**
  - **ALPROZOLAM (Xanax)**: 0.25mg tab
    - 1 tab by mouth 3 times per day as needed for anxiety
  - **HYDROCODONE-acetaminophen**: 325mg tab
    - 1 tab by mouth every 6h as needed for pain

- **Discontinued prescription medications**
  - **HYDROCODONE-acetaminophen**: 500mg tab (disc. 3/15/17)
  - **HYDROCODONE**: 325mg tab (disc. 9/5/16)

**PDMP View**

#### Summary

- **Narcotics (excluding buprenorphine)**
  - **Total Prescriptions:** 1
  - **Current Quantity:** 1
  - **Current MME/day:** 55.0
  - **30 Day Avg MME/day:** 55.0

- **Buprenorphine**
  - **Current Quantity:** 0
  - **Current MME/day:** 0.00
  - **30 Day Avg MME/day:** 0.00

#### Prescriptions

<table>
<thead>
<tr>
<th>Fill Date</th>
<th>ID</th>
<th>Written</th>
<th>Drug</th>
<th>Qty</th>
<th>Days</th>
<th>Dr. Test</th>
<th>Rx#</th>
<th>Pharmacy</th>
<th>Refill</th>
<th>Daily Dose</th>
<th>Pmt Type</th>
<th>PMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/1/18</td>
<td>1</td>
<td>9/12/18</td>
<td>HYDROCODONE-acetaminophen tab</td>
<td>30</td>
<td>30</td>
<td>Dr. Test</td>
<td>A1004</td>
<td>ALI (ZZ12)</td>
<td>1</td>
<td>325mg</td>
<td>Private</td>
<td>State</td>
</tr>
</tbody>
</table>

#### Providers

- **Doctor Test**
  - **Address:** 123 Fake St
  - **City:** Indianapolis
  - **State:** IN
  - **ZIP:** 46202
  - **DEA:** BR1111111

- **Test Pharmacy**
  - **Address:** 241 Fake St
  - **City:** Indianapolis
  - **State:** IN
  - **ZIP:** 46202
  - **DEA:** ZZ1234567

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**PDMP report**
Takeaway 1 of 3

**Make CDS easy, convenient, and relevant for clinicians & patients...**

- Patients are in pain... if not opioids, then what?
- Put relevant information in a single place
- Be thoughtful about risk prediction and communication

"You have the patients who definitely need the medications. You have the patients who definitely don’t need the medications. Then you have the really tough management cases of the ones in between that are difficult to assess whether or not they truly do need the medication."

[Harle et al. 2018 working]
Design and implement CDS faster...
Faster, collaboratively and evolving with the problem.

Yearly correlation b/w opioid Rx rates and overdose death rates:
- 2006: 0.21
- 2007: 0.33*
- 2008: 0.33*
- 2009: 0.26
- 2010: 0.45***
- 2011: 0.38**
- 2012: 0.3*
- 2013: 0.17
- 2014: 0.2
- 2015: 0.15
- 2016: -0.06
Make sure CDS actually works...
Need for rigorous health services research that estimates the impact of CDS on important processes and health outcomes

- Is the CDS getting used and improving quality?
- Are patient experiences and outcomes any better?
- Is CDS delivering value to the healthcare organization?
PCOR CDS-LN Contact Information

For updates on future events and activities of the PCOR CDS-LN please check out our website at www.pcorcds-ln.org

Project Team Contact Information:

– Principal Investigator: Barry Blumenfeld, MD, MS (bhb@rti.org)
– Better Decisions Together and TFWG: Joshua Richardson, PhD, MS, MLIS (jrichardson@rti.org)
– Collaboration Hub and Evaluation: Laura Marcial, PhD, MLIS (lmarcial@rti.org)
– Project Manager: Beth Lasater, MSPH (boverman@rti.org)