

The Role of Informatics in Implementing Guidelines for Chronic Opioid Therapy Risk Assessment in Primary Care: A Narrative Review Informed by the Socio-Technical Model

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Abstract

Approximately 2 million Americans live with opioid use disorder (OUD), most of whom also have chronic pain. The economic burden of chronic pain and prescription opioid misuse runs into billions of dollars. Patients on prescription opioids for chronic non-cancer pain (CNCP) are at increased risk for OUD and overdose. By adhering to the Center for Disease Control and Prevention (CDC) opioid prescribing guidelines, primary care providers (PCPs) have the potential to improve patient outcomes. But numerous provider, patient, and practice-specific factors challenge adherence to guidelines in primary care. Many of the barriers may be mediated by informatics interventions, but gaps in knowledge and unmet needs exist. This narrative review examines the risk assessment and harm reduction process in a socio-technical context to highlight the gaps in knowledge and unmet needs that can be mediated through informatics intervention.

Keywords:

Practice guidelines, implementation science, socio-technical context

Introduction

Approximately 16 million people worldwide and 2 million Americans live with OUD, which is defined as "a problematic pattern of opioid use leading to clinically significant impairment or distress." [1-3] OUD is associated with considerable morbidity and mortality, with individuals experiencing OUD at ten times higher risk for mortality than the general population.[4] In 2019, prescription opioids were involved in approximately 20% of the death from a drug overdose in the U.S., contributing significantly to the nation's opioid crisis. The cost of reduced quality of life from OUD and lost life due to fatal overdose was estimated to be close to 1.02 trillion dollars in 2017.[5]

The risk of developing OUD is especially high for patients experiencing chronic pain. Roughly 21 to 29 percent of patients prescribed opioids for chronic non-cancer pain misuse them, and between 8 and 12 percent develop OUD.[6] Primary care providers (PCPs) manage most chronic pain patients and prescribe about half of all prescription opioids.[7] Managing a complex and diverse patient population on chronic opioid therapy (COT) for non-cancer pain requires a balancing act of treating pain and preventing addiction and overdose. To provide clinicians with guidance in caring for this complex population and improve patient outcomes, the CDC has developed a set of safe opioid prescribing guidelines for chronic non-cancer pain.[8] Implementation of these guidelines has been challenging, and

adherence by PCPs is low.[9; 10] While barriers and facilitators to guideline adherence have been well studied, the challenges of recommended risk assessment and harm reduction tasks in a complex patient population is less understood and greatly underappreciated. PCPs integrate disparate data to assess their patient's risk from opioid pain relievers which can be a source of considerable cognitive burden for a busy PCP. In fact the increased burden of managing CNCP patients on LTOT deters some providers from accepting new patients in their practice thus limiting access to primary care for this vulnerable population.[11].

Informatics technology and methods have the potential to decrease provider burden, increase guideline adherence, and, ultimately, improve patient outcomes. A comprehensive understanding of risk-relevant information and an assessment of knowledge and information gaps is warranted to identify ideal points and methods for effective informatics solutions.

Literature Search and Framework Selection

We used a systems approach to understand and illustrate opioid prescribing and risk assessment for chronic non-cancer pain in primary care. The key risk assessment components mentioned in the CDC chronic opioid therapy risk assessment guidelines were identified and used as a guide to conduct a narrative literature review.[12] We searched PUBMED and SCOPUS for literature on Long Term Opioid Therapy (LTOT) for CNCP in primary care and challenges to guideline adherence. Constructs from the socio-technical model for health information technology (ST-HIT), Cabana, and Promoting Action on Research Implementation in Health Services (PARIHS) frameworks were used to explore knowledge and information gaps.[13-15] The socio-technical model is presented in Figure 1, and the summary of findings in Table 1.

Results

A Socio-Technical Model of Opioid Prescriptions in Primary Care

Nearly 20% of the visits in primary care involve three or more chronic conditions, with pain being one of the most common reasons for visits. Figure 1 is a conceptual model of opioid prescribing for chronic non-cancer pain in primary care. It illustrates the interplays between various social and technical components when assessing risk from opioid pain relievers for chronic non-cancer pain. Chronic pain is defined as pain lasting >90 days or beyond the time of normal tissue healing. A PCP,

when considering opioid medication for chronic pain, needs to contextualize the evidence-based guidelines with patient-specific data to make evidence-based, patient-centered decisions.

Intended Workflow and Process

A multi-faceted risk assessment process involves questioning the patient and reviewing patients' medical history in the electronic health record (EHR) to identify risk factors for adverse outcomes, including misuse, OUD, and overdose, from prescription opioids. Specifically, a prescriber should look for a history of overdose, present or past substance use disorder, and

the presence of mental health conditions. A high total dose of opioids and concurrent benzodiazepine use increase the risk for overdose. Patients' pharmacy dispense history reported in the state-run prescription drug monitoring program (PDMP) database should also be reviewed. PCPs check the PDMP database to confirm the total milligram morphine equivalent (MME) opioid dose and absence of drug-seeking behaviors like receipt of prescription opioids from multiple providers and pharmacies. Also, urine drug tests and validated risk assessment tools are recommended to screen for opioid misuse.

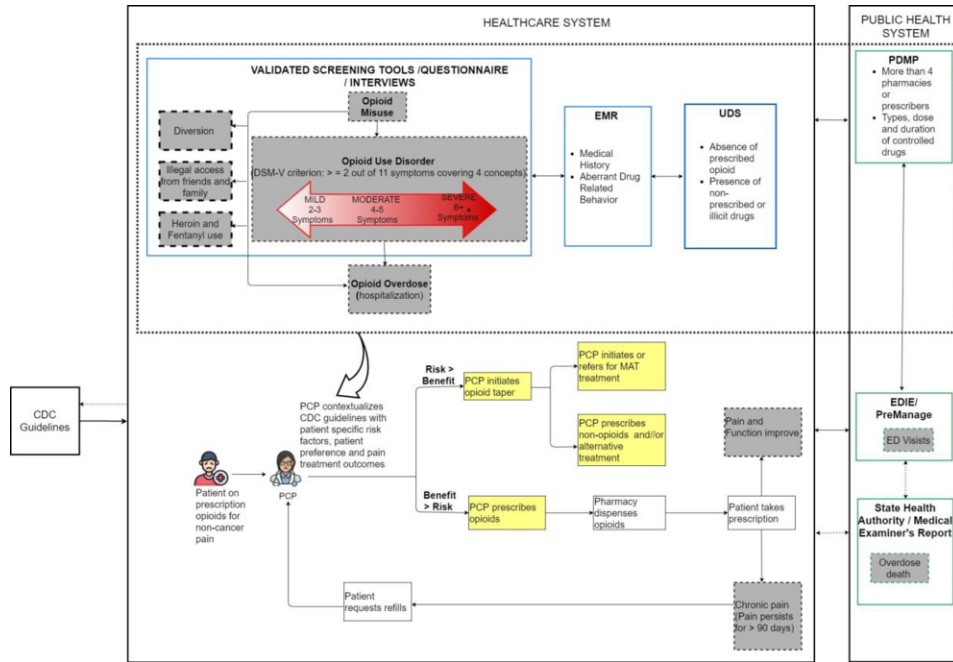


Figure-1. Systems view - Interplays between clinical tools, processes, and information systems in the primary care setting. Grey boxes: outcomes; Yellow boxes: clinical decisions; Information systems: EHR, PDMP, PreManage (a collective ambulatory platform that can receive data from Emergency Department Information Exchange (EDIE)), State Health Authority; Clinical decision tools/test: CDS (Clinical Decision Support); risk assesment tools, UDS (Urine Drug Screening)

Table -1. Summary of literature review along the different dimensions of the selected frameworks

DIMENSIONS	SYSTEM COMPONENT	SUMMARY
EXTERNAL POLICIES ^{a/} KNOWLEDGE ^{b/} EVIDENCE ^{c/}	CDC guidelines	It is important to note that most recommendations in the guidelines are supported by very weak evidence, type 3 or type 4. Though the intent of the CDC guidelines was not to be used as rigid rules, the recommended ceiling dose of 90 MME has been used as a hard limit by some payers and providers, leading to unintended consequences. Patients have been discharged from practice or abruptly tapered without appropriate weaning or OUD treatment.[9] Further, the guidelines do not specify how to taper safely. As far as identifying and predicting misuse and diagnosing OUD is concerned, no widely used risk assessment tool accurately predicts or identifies misuse, and applying DSM-V criteria to CNCP patients on LTOT has proven to be difficult.[9; 16].

CLINICAL CONTENT^a	EHR	Many factors seem to influence the quality of patient-specific risk data in the EHR, influencing the risk assessment process. Stigma associated with opioid addiction may have led to variable and inconsistent documentation of opioid misuse and abuse in the EHR.[17] There are variations in the use and documentation of screening tools in the EHR.[18] Aberrant drug-related behaviors, used as indicators of misuse, are inconsistently and unsystematically documented in the EHR.[19]
INTERNAL POLICIES, PROCEDURES and CULTURES^a/ BEHAVIOR^b/ FACILITATION^c	Organizational policies	Internal policies play significant roles in adherence to risk assessment tasks. Standardized opioid prescribing and monitoring policies improve adherence to guidelines.[20-22] Random urine drug tests and mandatory PDMP reviews effectively detect high-risk behavior and addiction even in low-risk patients and decrease monthly dispense of opioids and benzodiazepines, respectively.[23; 24] Development of a risk-assessment algorithm and risk-stratified monitoring guidelines also improve adherence to guidelines.[20] Further, non-collaborative opioid taper increases patient risk.[9] Organizational culture that embraces educational interventions and audit and feedback processes increases guideline adherence.[25; 26] "Academic detailing" models and a team-based approach to care with physician assistant care managers increase adherence to guidelines.[20; 27]
HUMAN-COMPUTER INTERFACE^a/ BEHAVIOR^b/ FACILITATION^c	EHR PDMP	A patient registry with regular dissemination of reports to PCPs increases adherence to guidelines.[20] Difficulty accessing the PDMP and acquiring patient medication history information within the PDMP, due to non-intuitive display, are significant barriers to its use.[28] Also, the lack of standards for PDMP integration into EHRs results in poor usability and decreased usage.[29] Increased interoperability and good human-computer interfaces can facilitate risk assessment and improve adherence.
PEOPLE^a/ KNOWLEDGE^b/ CONTEXT^c	PCPs Patients	Physicians underutilize Urine Drug Screens (UDS), written Opioid Use Agreements (OUA), and Prescription Drug Monitoring Programs (PDMP).[30-34] Variabilities exist among providers in the interpretation of opioid risks.[31] Some PCPs are reluctant to manage prescription opioids for CNCP patients.[35] Providers find the treatment of chronic pain challenging and desire additional training and referral support. [18] Lack of time and training are significant barriers to guideline adherence.[18; 36; 37] Educating providers leads to improved knowledge and confidence to manage COT patients per guidelines and increased screening practices.[38-40] A patient's risk level is determined based on the level of trust and history of knowing the patient.[41; 42] Further, a provider's ability to taper is influenced by medical contraindications of non-opioid alternatives, difficulty justifying opioid wean for patients who are stable on chronic opioid use, type of patient's insurance coverage, and patient-provider trust.[9; 43; 44]
WORKFLOW and COMMUNICATION^a/ FACILITATION^c/ CONTEXT^b	Workflow Practice type	Implementing workflow protocol improves adherence to best practices[46]; EHR innovations, like the <i>EHR dashboard</i> , facilitate communication and increases guideline adherence[20; 47] lack of availability of comprehensive, multimodal pain care may limit guideline adherence[9]
MEASURING AND MONITORING^a	Quality measures Data	There is a need for clinically relevant outcome measures.[48] Measuring outcomes is challenging due to inconsistent use of terminologies and ICD codes for problem opioid use and varying definition of LTOT, with 41 unique variations across 34 studies.[17; 49; 50]

Note: a- dimension from ST-HIT framework; b – dimensions from Cabana framework; c – dimension from PARIHS framework

Discussion

Barriers to implementing CDC guidelines exist at many levels. Knowledge and information gaps are major obstacles besides organizational structure, culture, and policies. Informatics interventions hold promise to bridge knowledge and information gaps. Educational and training tools for PCPs can improve

guideline application in practice. Interoperable information systems and well-designed human-computer interfaces can facilitate risk assessment tasks at the point of care. Patient registries and EHR dashboards can be used to improve cross-team communication and workflow. However, many risk assessment activities and associated diagnoses carry a considerable social stigma. Adoption of destigmatizing vocabularies and tools that enhance patient-provider communication and trust are needed. The Risk factors in CNCP patients on LTOT are dynamic. They can change with "disease progression, tolerance, changes in

pain quality, mental health, comorbidities, other drug therapies or drug interactions, and changes in the patient's lifestyle.”[51] When data from the screening tool is enhanced with the EHR data, PCPs can better differentiate the low-risk and high-risk populations.[52-54] There is a caveat to this though, the data in the EHR should be of good quality. There is a need to identify a minimum set of data that inform patients' risk from prescription opioids and improve its documentation in the EHR, using standard terminologies and vocabularies.

Furthermore, the impact of risk assessment on patient outcomes is not well understood. Improving data quality of patient outcomes, such as function, quality of life, misuse, OUD, and death, can better inform future policies and guidelines.

Conclusion

Informatics interventions can address the socio-technical challenges to assessing risk in patients on LTOT for CNCP. Improving the data quality of patient-specific risk factors and outcomes is critical for enhancing practice and strengthening evidence.

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