PARTNERSHIP *for*
HEALTH IT PATIENT SAFETY
a national collaborative

Measures and Clinical Decision Support for Safer Opioid Prescribing:

Recommendations and Implementation Strategies

Convened by

ECRI Institute

EHRA
HIMSS Electronic Health Record Association

Funded in part by
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Developed through the work of the HIMSS Electronic Health Record Association (EHRA) and ECRI Institute's internal *Partnership for Health IT Patient Safety* members.

Acknowledging and Thanking EHRA-ECRI Workgroup Members

ECRI Institute thanks the entire workgroup for everyone's contributions. The recommendations and implementation guidelines identified in the Safe Practice Recommendations for Safer Opioid Prescribing: Measures and Clinical Decision Support white paper were conceived and developed by members of the EHRA-ECRI Institute Safer Opioid Project workgroup. The following individuals provided time and talents in the development of these materials.

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Introduction

The United States is in the midst of a deadly opioid use epidemic.[1] Contributing to this crisis, between 3% and 10% of opioid-naïve patients prescribed opioids progress to persistent opioid use with the associated risk for abuse or dependence.[2] Although it is unknown exactly how clinicians' opioid prescribing habits are related to rates of subsequent misuse,[2] a few studies suggest specific parameters for how long or at what dosage opioids can be prescribed for opioid-naïve patients without inadvertently promoting long-term use.[3] As clinicians and healthcare organizations work to address the opioid epidemic, they are turning to health information technology (IT) for assistance.

As a result, it is increasingly clear that electronic health records (EHRs) and other health IT solutions have an important role to play in responding to the opioid crisis, including specific opportunities to increase patient safety.[4,5]

During 2018, EHRA and ECRI Institute's *Partnership for Health IT Patient Safety* recognized the unique opportunities that could emerge from a multidisciplinary, collaborative approach to safety issues. This work is informed by synergies realized by combining EHR developer expertise, information, and perspectives with the *Partnership's* evidence, knowledge, data, and data analysis available from ECRI Institute in its role as a Patient Safety Organization (PSO).[6]

Overview

The implementation strategies emphasized by the recommendations below are intended as a resource for—

- Developers of EHRs
- Developers of clinical decision support (CDS) content
- Those who develop and implement IT that tracks patients' prescriptions and exposure to controlled substances (e.g., prescription drug monitoring program [PDMP])
- Those who establish opioid-related quality measures
- Clinicians, healthcare organizations, and other relevant stakeholders

The EHRA-ECRI workgroup focused on recommendations that can enter the development lifecycle in the near term (i.e., one to three years).

These recommendations first and foremost aim to mitigate patient harm. They are intended to be care-setting neutral and applicable to opioids prescribed both in and outside of the hospital, and they focus specifically on opioid-naïve* and opioid-exposed† patients. In this context, potential issues can be identified and addressed at the earliest stage in the treatment of an acute pain event.

The workgroup recommendations identify and address the need for EHRs to collect the data elements needed to support measures and drive CDS; ensure that opioid-prescribing CDS interventions are delivered at the right time in the workflow; and enable technologies to measure and monitor prescribing patterns to allow safer opioid prescribing.

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* An opioid-naïve patient is defined here as a patient who has never been exposed to an opioid drug.

† An opioid-exposed patient is defined here as one who has a prior history of taking an opioid drug for an acute pain event in their lifetime, not presently taking an opioid, and does not have an active prescription.

Recommendations

Enable technologies to measure and monitor prescribing patterns to allow safer opioid prescribing

Ensure that EHRs can collect and access the data elements needed to support measures and drive CDS

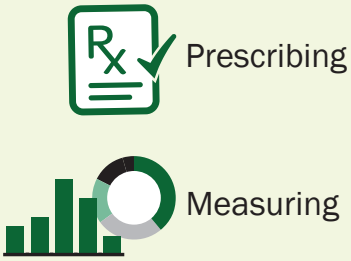
Ensure that opioid-prescribing CDS interventions are delivered at the right time in the workflow for both opioid-naïve and opioid-exposed patients

The recommendations for developers of EHRs and CDS are intended to enhance the ability of clinicians to safely prescribe opioids by evaluating measures, patient risk factors, and current, recognized guidelines.

Using the following strategies, stakeholders can facilitate the measurement of critical factors in opioid prescribing and implementation of workflow-appropriate CDS. The goal of this synergistic cycle of measurement and CDS is to identify appropriate treatments and therapies for both opioid-naïve and opioid-exposed patients that can minimize incidents of persistent use or unintentional overdose. Additional detail on implementation strategies can be found here for each recommendation in the report and suggestions for implementing each recommendation.

Enable technologies to measure and monitor prescribing patterns to allow safer opioid prescribing

Rationale: Using health IT to measure internal and external metrics for prescribing patterns along with transparent utilization and performance can have significant positive impact on provider prescribing practices.[7]



What is technology's role?

Technology can facilitate healthcare organization and clinician capability to measure opioid-prescribing patterns by ensuring that clinicians can collect the data elements needed and use them with health IT to compute and display measures whose use can promote safer prescribing behaviors.

What can stakeholders do?

Stakeholders can establish and implement measures associated with progression to persistent opioid use that can be calculated and shared to increase awareness of opioid-prescribing behaviors and patterns.

How can this be done?

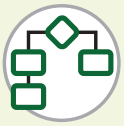
- By enabling measurement and display of opioid-prescribing patterns for healthcare organizations and prescribers by drug name, type (short-acting, long-acting), dose, and quantity, prescriber access, patient access, practice site, diagnosis, and procedure
- By seeking to implement at least two available opioid-prescribing measures that have been endorsed by the National Quality Forum (NQF),[8] reflecting user priorities and available data
- By measuring and providing feedback on overrides of opioid-related CDS

Table 1. How Various Stakeholders Can Enable Technologies to Measure and Monitor Prescribing Patterns

Stakeholders	Requirements
EHR developers	■ Enable measurement, access, and dissemination of provider, provider groups, and provider organizations' opioid prescribing metrics via interactive dashboard displays and summarized reports ■ Clinician and EHR Developer access to such data will depend on practices and actions by external data holders, such as PDMPs and e-prescribing vendors like Surescripts
Clinicians	■ Review dashboard displays and summarized reports that communicate individual prescriber's metrics that measure the following: — Drug name, type, dose, and quantity of opioids prescribed per patient — Duration of opioid prescriptions (e.g., days' supply, length of therapy) ■ Review and evaluate dashboard displays and summarized reports that communicate on measures related to individual provider prescribing patterns and workflow behaviors, such as the following: — Mean daily morphine milligram equivalents (MMEs*) prescribed per patient — MMEs per total prescription per patient — Documented use/review of the patient's PDMP report — CDS override rates and reason by intervention type (e.g., risk factor alert, dosing parameter guideline)
Healthcare organizations	■ Involve clinicians in design and implementation of prescribing measures and provide the IT technical expertise needed to configure, implement, and support ongoing maintenance of tools that facilitate reporting and display of prominent metrics, for example— — Drug name, type, and quantity of opioids prescribed matched to diagnosis and procedure codes — Documented use and review of PDMP reports per provider, provider group, and organization — CDS override rates by intervention types (e.g., risk factor alert, dosing parameter guideline, alternative therapy) — Other relevant measures endorsed by external organizations (e.g., NQF, Centers for Disease Control and Prevention [CDC] Centers for Medicare and Medicaid Services [CMS])

* MME is determined by using an equivalency factor to calculate a dose of morphine that is equivalent to the ordered opioid. Daily MED is the sum of the MME of all opioids a patient is likely to take within 24 hours, and that total is used to determine whether the patient is nearing a potentially dangerous threshold.

Ensure that EHRs can collect and access the data elements needed to support measures and drive CDS



Rationale: Collecting, accessing, and incorporating computable data elements to inform safer prescribing will enable the use of data elements for measure calculation and CDS use (in computable format).[9]

What is technology's role?

The workgroup proposes that EHR developers—as an industry and working with key stakeholders—facilitate the integration, aggregation, and correlation of data elements from within the EHR and multiple external sources. The technology needs to ensure that EHRs can collect the data needed to drive metrics by promoting and facilitating structured data capture and data mapping based on agreed-upon standard nomenclature (e.g., Systematized Nomenclature of Medicine — Clinical Terms [SNOMED-CT], Logical Observation Identifiers Names and Codes [LOINC®], International Classification of Diseases [ICD], Current Procedural Terminology [CPT]) and integrate data elements currently stored outside of the EHR (e.g., PDMP).

What can stakeholders do?

For stakeholders, the implementation of standardized data fields relevant to assessing and treating acute pain and opioid-prescribing clinical workflows will enable the data capture needed to develop CDS algorithms, interventions (e.g., alerts and triggers), and the creation of quality and safety measure calculations.

How can this be done?

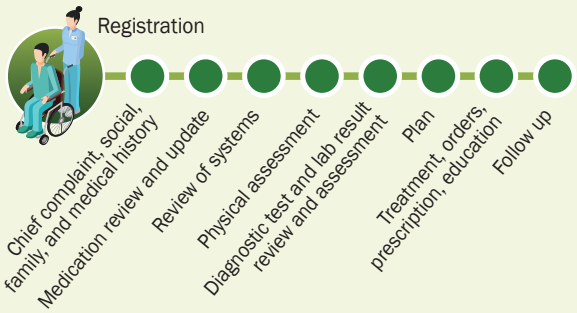
- By incorporating CDC's[10] opioid-prescribing guidelines into EHR templates and CDS
- By adding structured and standardized measures of opioid risk into the EHR
- By establishing data fields to track MMEs and enable capture and display of this field, based on prescribing within the practice and externally obtained opioid-prescribing information as available

Table 2. Stakeholders Can Ensure EHRs Can Collect and Provide Access to Measures

Stakeholders	Requirements
EHR developers	■ Enable normalization and correlation of data; enable the ability to aggregate data related to patient risk factors and other risk information ■ Ensure that EHR data are available in a structured and computable format (e.g., patient demographics, social history) ■ Employ standardized nomenclatures (e.g., SNOMED-CT, LOINC®, ICD, CPT, National Drug Code [NDC], RxNorm®) across data-holding systems to capture relevant patient data (e.g., diagnosis, comorbidities, procedure, medication history) ■ Provide the data, algorithms, or rules needed to trigger CDS content that is applicable to both opioid-naïve and opioid-exposed patient populations, based on risk factors, diagnosis, or procedure, at the right time in the clinical workflow ■ Collaborate with stakeholders responsible for external systems (PDMP, pharmacies, calculation apps) to enable the integration of data relevant to opioid prescribing needed to drive metrics
CDS content developers	■ Offer CDS content to EHRs that emphasizes both opioid-naïve and opioid-exposed prescribing guidelines, drug interactions (e.g., benzodiazepines, muscle relaxants), and alternative therapies (e.g., physical therapy for low back pain) ■ Collaborate with EHR developers to facilitate the triggering of the appropriate decision-support intervention at the right time in the clinical workflow
Regulators	■ Optimize EHR interoperability and integrate controlled-substance data in PDMPs across the United States; enact laws and provide the funding needed to— — Standardize administrative features and functional requirements across state programs — Establish consistent regulations for PDMP access and review by clinicians prior to opioid prescribing — Support and fund program development efforts that will support data sharing across states
Healthcare organizations	■ Provide the clinical informatics and information technology resources needed to support system optimization and/or software updates that provide new and relevant data elements, CDS content, workflow design, and reporting enhancements to improve opioid-naïve and opioid-exposed prescribing patterns and behaviors ■ Recruit and encourage clinicians to be involved with workflow analysis, design, and usability testing ■ Seek support and expertise from EHR and CDS content developers as needed

Ensure that opioid-prescribing CDS interventions are delivered at the right time in the workflow for both opioid-naïve and opioid-exposed patients

Rationale: Providing CDS intervention at the right time in the workflow will enable safer and more effective opioid prescribing. CDS at the right time will facilitate effective use of CDS functions, and limiting repetitive CDS will reduce physicians' burden (e.g., by eliminating unnecessary interruptions in the clinical workflow and minimizing alert fatigue).[11,12]



What is technology's role?

For technology to enable safer and more effective opioid prescribing, it needs to leverage and optimize health IT so that CDS operates at the right time in the clinician's workflow. CDS interventions should be triggered using specific evidence-based data elements in the EHR (e.g., demographics, medication history, and comorbidities) to identify the opioid-naïve and opioid-exposed patients more effectively and to identify their risk factors to the provider at the appropriate time in the workflow.[11,12]

What can stakeholders do?

Stakeholders can investigate emerging standards and technology approaches that enable access to specific data elements. Notably, application program interfaces (APIs) using HL7® Fast Healthcare Interoperability Resources (FHIR®), and apps developed using the SMART on FHIR[13] standard should increase the availability of external data sources to complement CDS-relevant data collected in the EHR. The integration of this information can be used to create CDS interventions that are patient-specific and based on demographics, medication history, comorbidities, and risk.[14,15]

How can this be done?

- By implementing opioid prescribing CDS into the EHR workflow and ensuring that CDS is enabled and triggered at the appropriate phase of the clinical workflow, based on industry best practices and client feedback
- When it is sufficiently mature, implement the CDS Hooks standard to enhance the capability to integrate CDS, including externally developed CDS content, into the clinical workflow

Table 3. How Various Stakeholders Can Ensure Opioid-Related CDS is Delivered at the Appropriate Time in the Workflow

Stakeholders	Requirements
EHR developers	■ Use standards and standards-based interfaces ([HL7® V2, HL7® FHIR®] to access and/or exchange information across disparate systems [EHRs, PDMPs, prescription databases such as Surescripts, CDS content]) ■ Enable the EHR's ability to collect, aggregate, and when necessary, calculate the appropriate data elements to influence prescribing behaviors, such as— — Risk factors associated with progression to persistent opioid use (e.g., mental health conditions, tobacco use) — Calculated risk scores that use available EHR data (ideally scores that are clinically validated) — Contraindicated medications (e.g., benzodiazepines) documented in patient's prescription history ■ Design algorithms that can prompt and provide information to the clinician at the appropriate time in the workflow — Prompt the clinician to discuss the pain management plan (e.g., preoperatively, preprocedure, triggering as appropriate by identified ICD code or other indicators for this action) — Provide links so that the opioid treatment agreement can be accessed and printed before ordering the prescription — Provide and print education resources that can be useful to the patient or provider ■ Provide actionable CDS interventions that permit overrides and enable rationale documentation with ease ■ Correlate the criticality of all decision support alerts and reminders with level of intrusiveness to reduce alert fatigue, and consider tools that help clinicians recognize critical information (e.g., tiered alerts, icons)
CDS content developers	■ Provide evidence-based acute pain management content and triggers that will support both opioid-naïve and opioid-exposed prescribing workflows — Patient-level predictors that suggest predisposed progression to persistent opioid use — Prescribing guidelines — Pain management education tools for opioid-naïve and opioid-exposed patients — Pain management education tools for clinicians
Healthcare organizations	■ Collaborate with the EHR developer if you are interested in participating in designing clinical workflows so that you can help developers identify what CDS intervention(s) and information clinicians will need at each step in the workflow ■ Conduct usability testing prior to go-live in the production environment to ensure that the designed workflow meets the needs of the clinicians; identify if and when over-alerting is occurring ■ After go-live, monitor CDS overrides and use of the external information clinicians are accessing, and modify as needed

Conclusion

This project addressed safer opioid prescribing and focused on both the opioid-naïve and opioid-exposed populations (rather than chronic pain and opioid-tolerant or opioid-dependent patients). It generated recommendations targeting the synergistic cycles of measurement and CDS aimed at mitigating overuse of opioids and the resulting potential for opioid dependence. The recommendations developed by the EHRA/ECRI Institute workgroup are intended to apply equally to all practice settings.

Addressing the opioid crisis is clearly a shared responsibility. EHR and content developers can create tools and improve CDS. The value of these offerings depends critically on decisions and actions of regulators, professional organizations, those developing standards and measures, healthcare organizations, clinicians, and the patients themselves.

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About EHRA

Established in 2004, the Electronic Health Record Association (EHRA) brings together companies that develop, market, and support electronic health records (EHRs), to collaborate on issues that impact our businesses and our collective customers—hospitals and providers that represent the majority of EHR users in the United States. We work together to speak with a unified voice on these topics in a noncompetitive, collegial effort to understand, educate, and collaborate with all stakeholders engaged with EHRs and health information technology.

EHRA operates on the premise that the rapid, widespread adoption of EHRs is essential to improve the quality of patient care, as well as the productivity and sustainability of the healthcare system as a key enabler of healthcare transformation.

The EHR Association and its members are committed to supporting safe healthcare delivery, fostering continued innovation, and operating with high integrity in the market for our users and their patients and families.

For more information,
please visit www.ehra.org.

About ECRI Institute and About the *Partnership for Health IT Patient Safety*

Established in 1968, ECRI Institute is an independent, nonprofit organization, and it serves as a trusted authority on healthcare practices and products that improve the safety, quality, and cost-effectiveness of patient care.

ECRI Institute's conflict-of-interest rules foster an environment that maximizes integrity of process. ECRI Institute accepts no advertising revenue from any source. ECRI Institute accepts no gifts, finders' fees, or consulting projects from medical device or pharmaceutical firms. These unconventional approaches make ECRI Institute a respected and trusted independent source of truth. The impact is realized across three main areas critical for healthcare effectiveness today: patient safety assurance, strategic supply chain assurance, and evidence-based clinical assurance.

ECRI Institute serves more than 5,000 members and clients globally, including hospitals, health systems, ambulatory care and aging services providers, healthcare liability insurers, public and private payers, U.S. federal and state government agencies, non-U.S. ministries of health, and accrediting agencies worldwide.

ECRI Institute's interdisciplinary staff of nearly 450 includes biomedical engineers, clinicians, public health professionals, health information technology specialists, and researchers who marry practical experience and uncompromising independence with the thoroughness of objective, evidence-based research.

In 2013, ECRI Institute convened the *Partnership for Health IT Patient Safety* (*Partnership*), in part because of ECRI Institute's long history of cutting-edge patient safety initiatives, and in part, in response to the growth in recognition that action was needed not only to fully realize the benefits of health information technology, but to involve the appropriate parties in the identification, classification, aggregation, analysis, and development of solutions to the ever-increasing concerns attributed to health information technology. The *Partnership* was established to make healthcare safer by understanding and mitigating health IT hazards and safety events.

For more information on
the *Partnership*, please visit
https://www.ecri.org/solutions/hit-partnership.

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