

University Hospitals' Response to the Opioid Crisis:

A Holistic Approach to Pain Management Buoyed By Technology

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Allscripts

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Objectives

- Scale and complexity of the opioid crisis
- Key elements of a system- and region-wide coordinated effort
- Essential existing and emerging health IT touch points
 - Within and above the EHR, relevant to the opioid crisis
- Recognize importance of analytics
 - Monitor local prescribing patterns
 - Overdose rates & predictive analytics at the point of care

Ohio the “Face of the Nation’s Opioid Epidemic”

U.S. Senate Finance Comm. Oct 2016

University Hospitals Overview

- **\$4.0+ billion** system annual revenues
- **Super-regional** healthcare system
 - **Over 1.2 million** patients annually
 - **18** hospitals
 - **50+** health centers and outpatient facilities
 - UH ACO: **350,000** members
 - **28,000** employees and physicians
 - **5,300** opioid prescribers



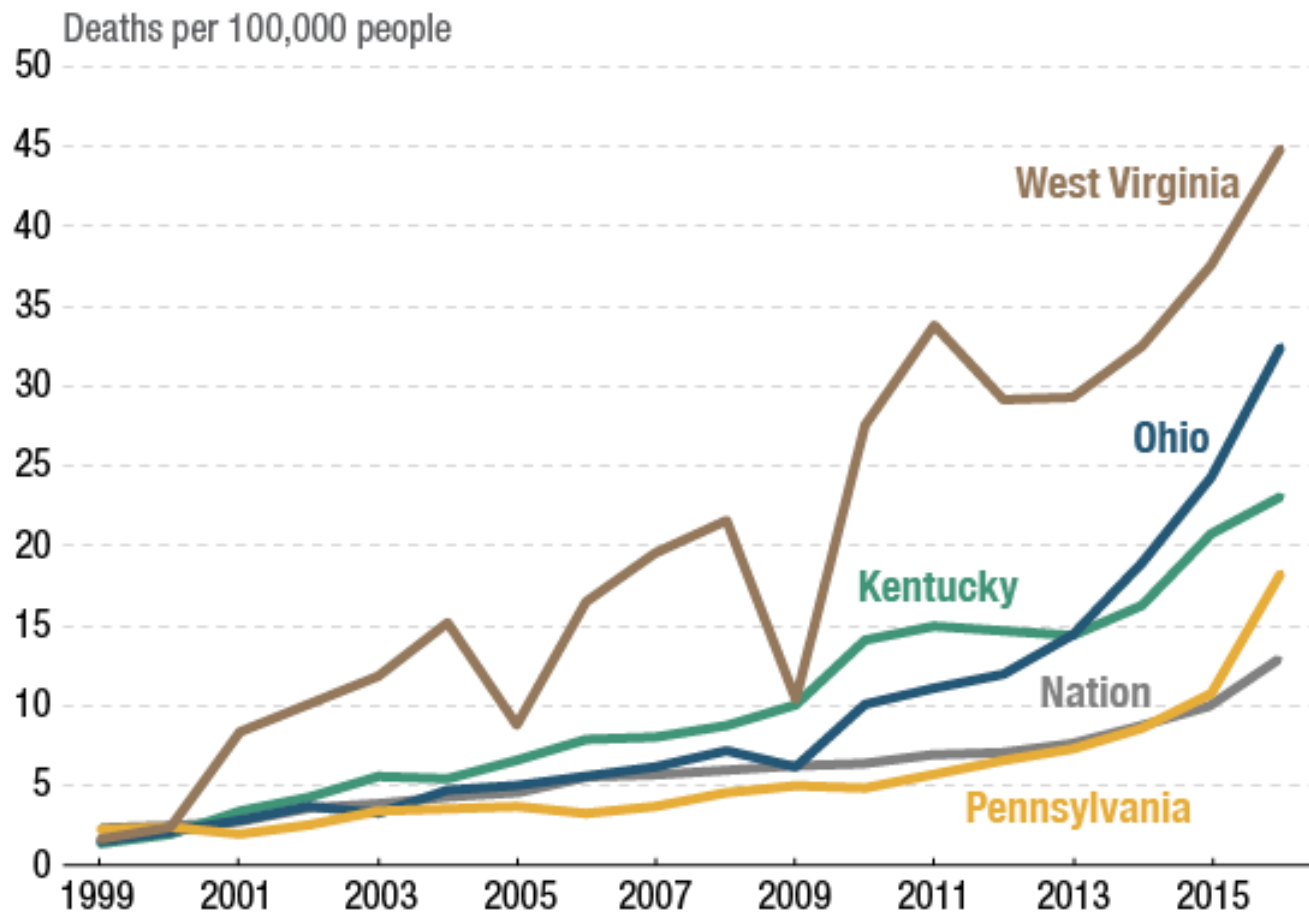
National Overdose Deaths

Number of Deaths Involving Opioids



Source: National Center for Health Statistics, CDC Wonder

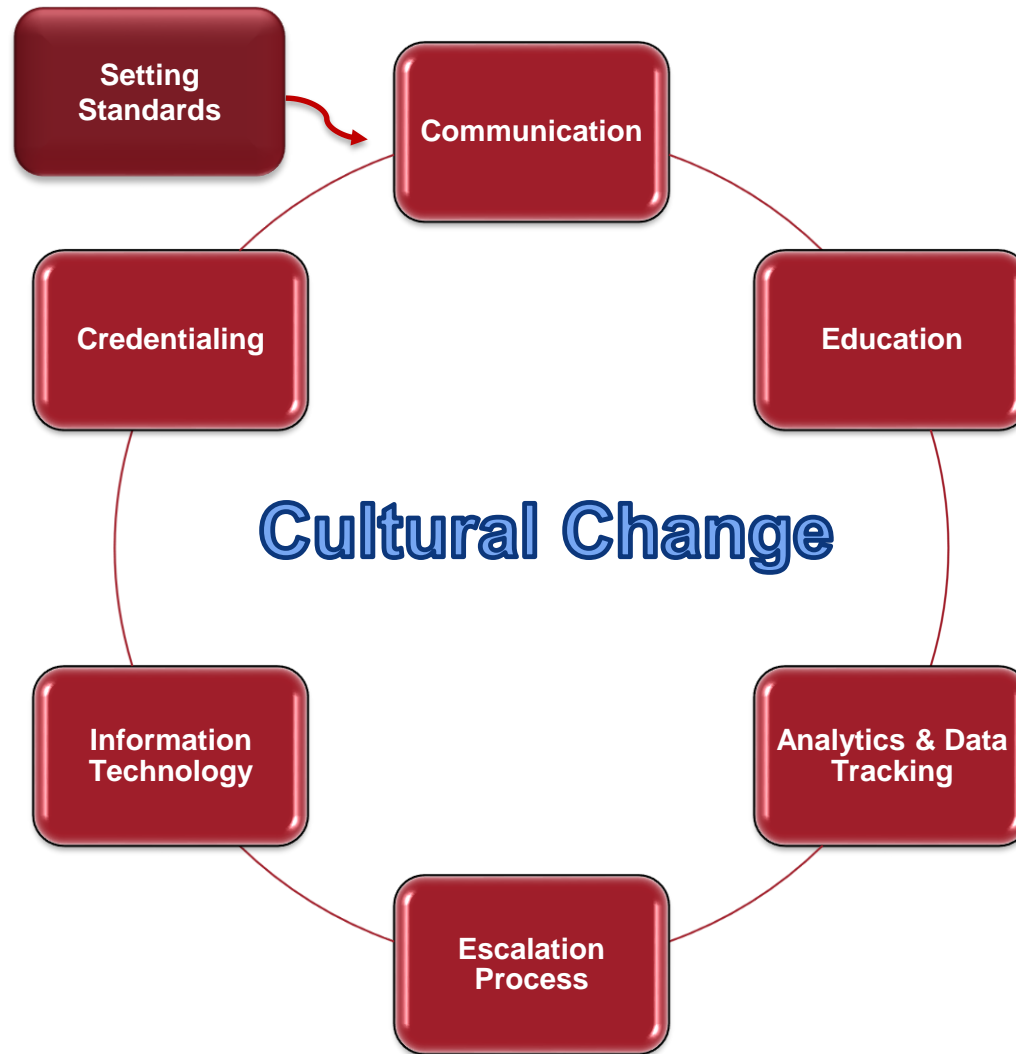
Figure 1. Opioid Overdose Death Rates in Kentucky, Ohio, Pennsylvania, West Virginia, and the Nation, 1999–2016



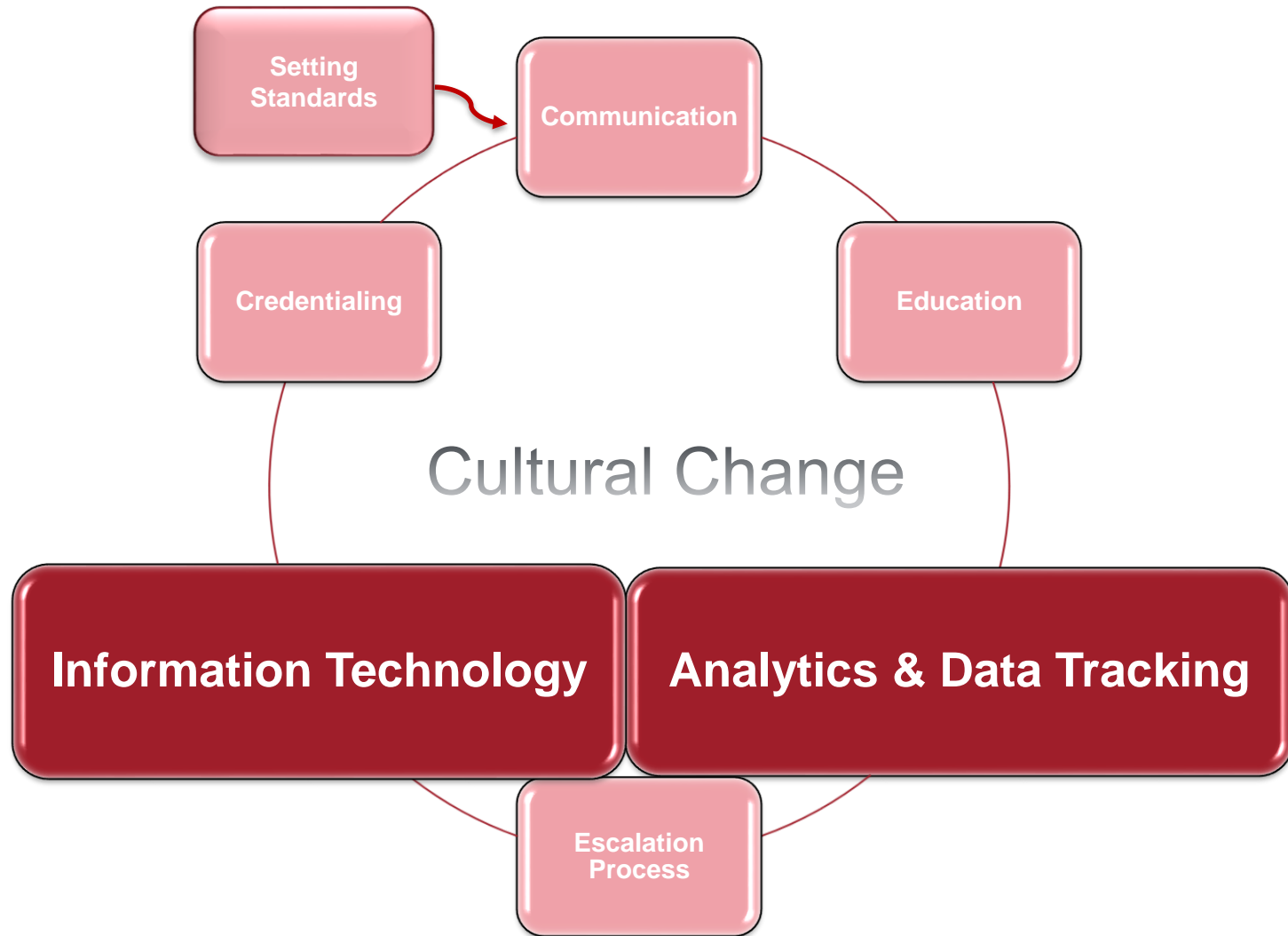
Source: Centers for Disease Control and Prevention

Using our IT resources to fight the crisis...

Plan for Success



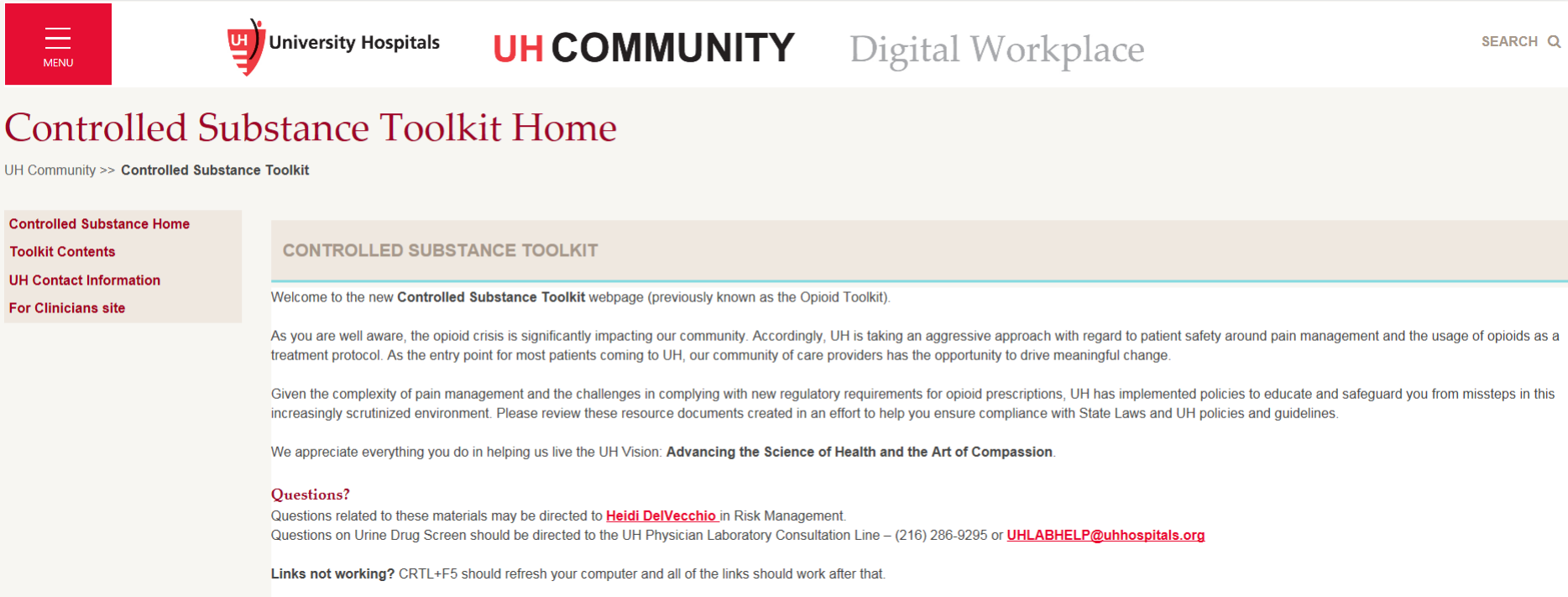
Plan for Success






Leveraging our IT Resources

- Clinical Decision Support
 - Toolkit & education
 - Up to Date UH guidelines and decision making tools
 - Documentation tools
 - Direct link to OARRS (Ohio's PDMP) and e-Prescribing
- Analytics
 - Prescribing patterns
 - MMEs, pill counts
 - Comparative data within specialty
 - Referral patterns and tools
 - Utilization of tools
- Partnerships
 - Allscripts EMR partners
 - Local data collaboratives
- The Future...

Controlled Substance Toolkit Live – 4/23/2018



  **UH COMMUNITY** Digital Workplace SEARCH 

Controlled Substance Toolkit Home

UH Community >> **Controlled Substance Toolkit**

- Controlled Substance Home**
- Toolkit Contents
- UH Contact Information
- For Clinicians site

CONTROLLED SUBSTANCE TOOLKIT

Welcome to the new **Controlled Substance Toolkit** webpage (previously known as the Opioid Toolkit).

As you are well aware, the opioid crisis is significantly impacting our community. Accordingly, UH is taking an aggressive approach with regard to patient safety around pain management and the usage of opioids as a treatment protocol. As the entry point for most patients coming to UH, our community of care providers has the opportunity to drive meaningful change.

Given the complexity of pain management and the challenges in complying with new regulatory requirements for opioid prescriptions, UH has implemented policies to educate and safeguard you from missteps in this increasingly scrutinized environment. Please review these resource documents created in an effort to help you ensure compliance with State Laws and UH policies and guidelines.

We appreciate everything you do in helping us live the UH Vision: **Advancing the Science of Health and the Art of Compassion.**

Questions?
Questions related to these materials may be directed to [Heidi DelVecchio](#) in Risk Management.
Questions on Urine Drug Screen should be directed to the UH Physician Laboratory Consultation Line – (216) 286-9295 or UHLABHELP@uhhospitals.org

Links not working? CTRL+F5 should refresh your computer and all of the links should work after that.

Opioid Prescribing Guidelines 2018

University Hospitals Opioid Prescribing Guidelines 2018

	For Pain Presenting at ED & Acute Care Facilities	For Acute Pain Outside of Emergency Department	For Post-Surgical Pain	For Chronic and Palliative Care Pain	For Hospice Care Pain
Specific Goals	Stop inappropriate prescribing from ED & Urgent Care Centers	Limit first use of opioids and decrease availability of unused opioid medications	Prevent long-term opioid dependency post-surgery	Ensure long-term patient safety while managing long-term pain	Symptom management and end-of-life comfort care
Prescribing Limitations	<ul style="list-style-type: none"> Consider non-pharmacologic and non-opioid therapies Avoid prescribing more than 3 day supply of opioids for acute pain Do not exceed an average of 30 MED per day Must document reason if prescribing in excess of day supply and MED limits No long-acting opioids Avoid co-prescribing of benzodiazepines 	<ul style="list-style-type: none"> Consider non-pharmacologic and non-opioid therapies Do not prescribe more than 7 days of opioids for adults Do not prescribe more than 5 days of opioids for minors No long-acting opioids Avoid co-prescribing of benzos. 	<ul style="list-style-type: none"> Supply only the number of pills believed to be necessary (procedure specific) Avoid co-prescribing of benzodiazepines 	<ul style="list-style-type: none"> "Press pause" and reassess at ≥80 MED per day Avoid co-prescribing of benzodiazepines for chronic pain Caution co-prescribing of benzodiazepines for palliative care pain 	<ul style="list-style-type: none"> Cancer or terminal illness diagnosis 2 week supply Caution with co-prescribing of benzodiazepines
OARRS Requirements (Ohio Automated Rx Reporting System)	<ul style="list-style-type: none"> Check prior to prescribing if script greater than 3 days Document prescriber assessment of OARRS report and scan report into chart 	<ul style="list-style-type: none"> Check prior to prescribing Document prescriber assessment of OARRS report and scan report into chart 	<ul style="list-style-type: none"> OARRS check not required by law; however, provider should check OARRS if there is a reason to believe that patient may be abusing or diverting 	<ul style="list-style-type: none"> Check prior to prescribing and again every 90 days Document prescriber assessment of OARRS report and scan report into chart 	<ul style="list-style-type: none"> OARRS not required by law; however, recommend check prior to prescribing and again every 90 days Document prescriber assessment of OARRS report and scan report into chart
Important Clinical Steps	<ul style="list-style-type: none"> Assess for risk of addiction, abuse and/or diversion using "red flags" below Referral to primary care or specialist for evaluation, treatment and monitoring of continuing pain Consider providing community resource list upon discharge 	<ul style="list-style-type: none"> Assess for risk of addiction, abuse and/or diversion using "red flags" below 2 weeks is a trigger for in-person reevaluation Consider referral to specialist for patients with persisting pain Consider random urine toxicology screens Consider controlled substance agreement when duration of opioid If prescribing >30 days, see Chronic Pain guidelines 	<ul style="list-style-type: none"> Assess for risk of addiction, abuse and/or diversion using "red flags" below Avoid high-volume, short-acting PRN doses for breakthrough pain If pain persists beyond expected duration, reevaluate and refer as indicated Consider controlled substance agreement when duration of opioid >30 days 	<ul style="list-style-type: none"> Assess for risk of addiction, abuse and/or diversion using "red flags" below Patient must be seen in office every 90 days for re-evaluation of pain, function, medication effectiveness Complete controlled substance agreement Obtain initial and annual random urine toxicology screens Consider referral to specialist for patients with persisting pain 	<ul style="list-style-type: none"> 48 hours a trigger for reevaluation Clinical visits and interdisciplinary team meetings 14 day supply Assess for risk of addiction, abuse and/or diversion using "red flags" below Education on disposing of controlled substances after patient death
Additional Key Points	<ul style="list-style-type: none"> Screen for "red flags" (e.g., known history of chemical abuse or substance use disorder, exam does not corroborate the complaint, frequently requesting early refills); Discuss with patient a planned wean off opioid therapy; Discuss proper secure storage and disposal of unused medications; and Remind patient that it is both unsafe and unlawful to give away or sell opioid medication 				

Confidential Quality Assurance/Peer Review Privileged Pursuant to Ohio Revised Code Sections 2305.24, 2305.25, .251, .252, .253.

Documentation Templates

- Embedded standards of documentation
 - Pain scales, risk identifiers, functional status
- Best practices
 - Reminders and Education
- Analytics of utilization
 - Track utilization
 - Identify educational opportunities
 - Data to direct continuous improvement
- Lets not forget provider happiness 😊

Mandatory Utilization

- OARRS (Ohio's PDMP)
 - State law mandates
 - Completion and Documentation is a significant challenge for clinicians and office staff
 - No good way to understand compliance
 - NEW: Direct link to OARRS
 - Easy access
 - Direct documentation and ability to measure
 - Decrease staff and provider workload
- e-Prescribing
 - Hurdles for controlled substances, already doing all other meds
 - Launch end of 2018
 - Mandate use vs. other meds.

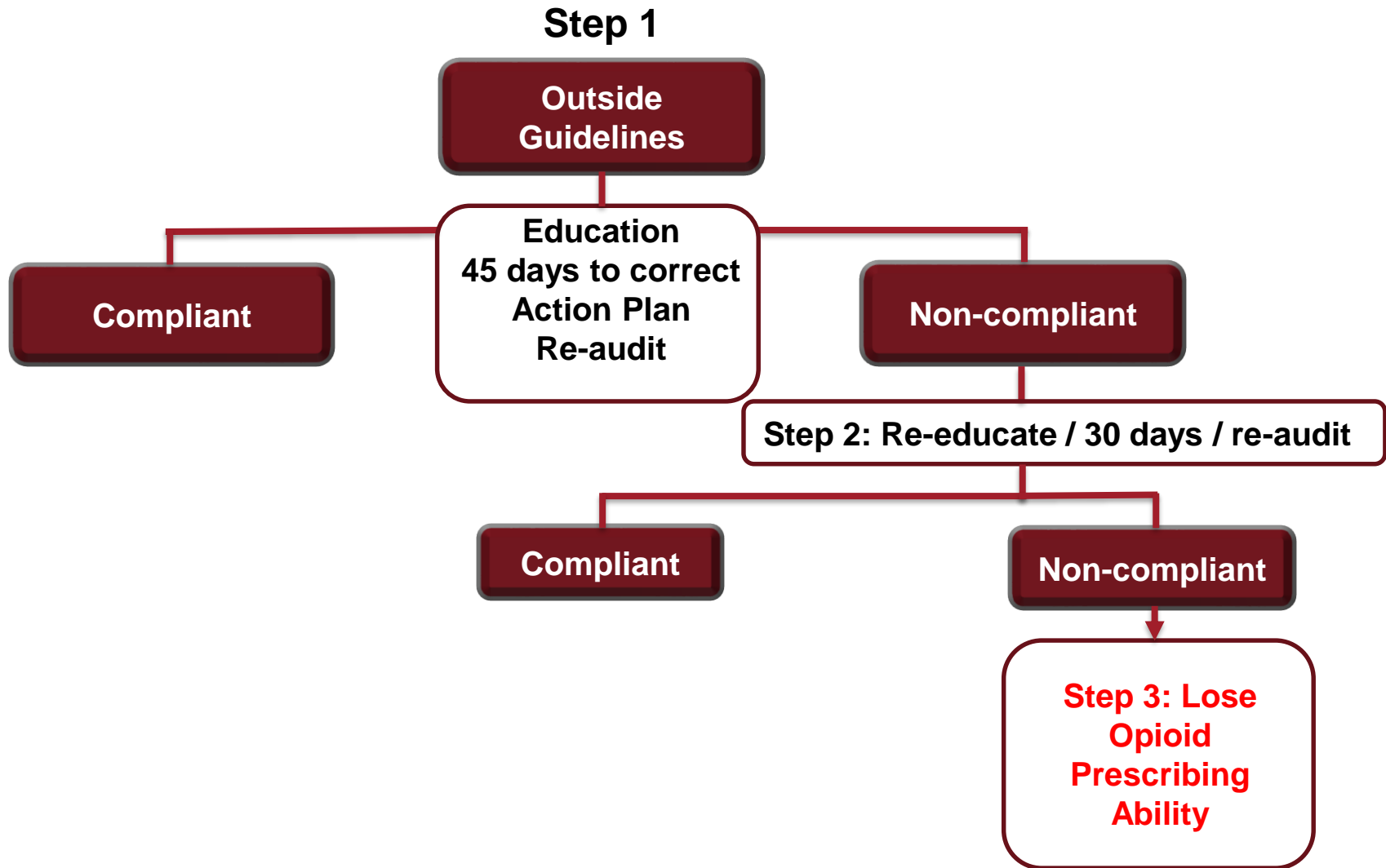
Outcomes

...We ARE Making a Difference

Metrics of outcomes

- Easy to measure pill decreases
 - Correlates to our work
 - Discretely measured
- Difficult to measure the *SAFETY* while still receiving opioids
 - Efforts not solely focused on pill counts
 - Education
 - Governance
 - Accountability to 100% compliance with expectations
 - Measurement is now feasible

Controlled Substance Quality Assurance Chart Review (QACR)



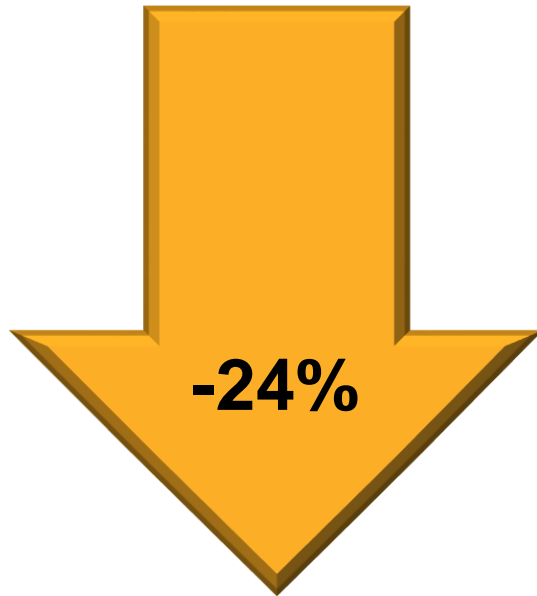
“In the debate over opioid addiction, there’s one group we aren’t hearing from: chronic pain patients, many of whom need to use the drugs on a long-term basis.” ~ S.E. Smith

UH Results Thus Far

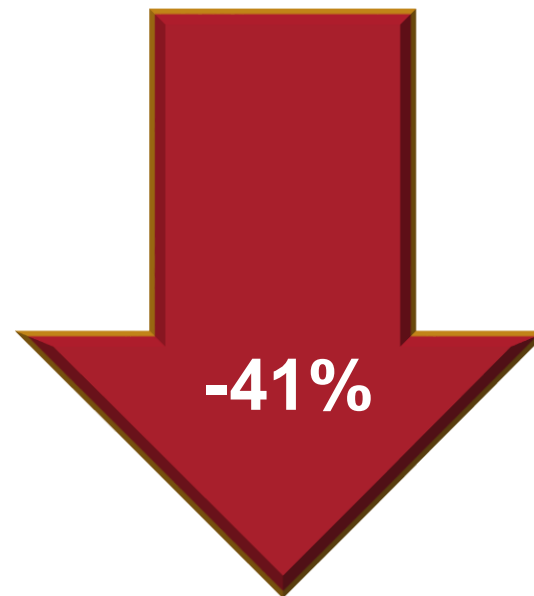
Ambulatory Morphine Equivalent Unit Doses/Day

July 2017 – June 2018

Family Medicine



Internal Medicine

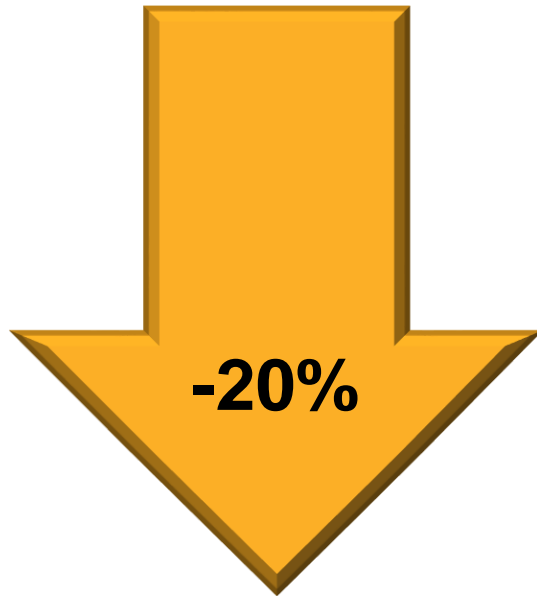


UH Results Thus Far

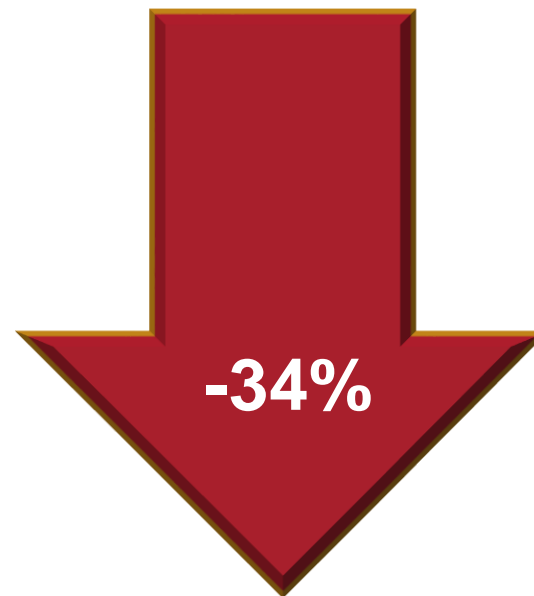
Ambulatory Number of Opioid Units

July 2017 – June 2018

Family Medicine



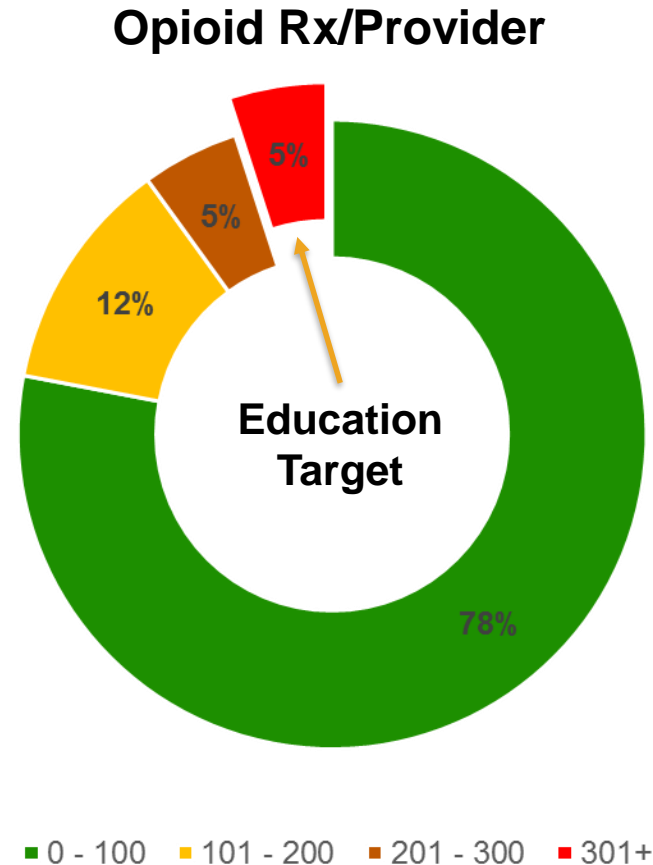
Internal Medicine



Synergy: opioid prescriptions

ED Fast Facts (Jan 2017 to May 2018)

- 451 unique providers
- 392,000 visits
- 30,270 opiate Rxs
- National Avg.¹: 12%
- UH rate: **7.7%**



¹ (30MED/< 3 days)

Hoppe et al. Opioid prescribing in a cross-section of US EDs; AEM 2015

Partnerships

**NEO Hospital
Opioid Consortium**
Best practice sharing



Allscripts
Enhancing our intelligence



Role of Healthcare IT in the Opioid Crisis

- Health Care Information Technology Tools
- Examples

Healthcare Information Technology Tools

- **Help prescribers make more informed decisions**
 - Prescription Drug Monitoring Program (PDMP)
 - Clinical Decision Support (Opioid Prescribing Guidelines)
- **Securely Prescribe Opioids**
 - Electronic Prescribing Controlled Substances (ECSP)
- **Measure Impact of Above**
 - Opioid Prescribing Patterns, Overdose and Death Rates (Analytics)

Prescription Drug Monitoring Program



Source: Centers for Disease Control and Prevention Opioid Abuse website <https://www.cdc.gov/drugoverdose/pdmp/states.html>

- **49 of 50 US states have an operational PDMP database**

Value: Detect “doctor shopping”, validate legitimate opioid use

Keys to success: integrate within clinician workflow, single sign on from EHR, patient context specific

Challenge: lack of centralized national PDMP database, may not be seeing “whole picture”

Clinical Decision Support

GUIDELINE FOR PRESCRIBING OPIOIDS FOR CHRONIC PAIN

IMPROVING PRACTICE THROUGH RECOMMENDATIONS

CDC's *Guideline for Prescribing Opioids for Chronic Pain* is intended to improve communication between providers and patients about the risks and benefits of opioid therapy for chronic pain, improve the safety and effectiveness of pain treatment, and reduce the risks associated with long-term opioid therapy, including opioid use disorder and overdose. The Guideline is not intended for patients who are in active cancer treatment, palliative care, or end-of-life care.

DETERMINING WHEN TO INITIATE OR CONTINUE OPIOIDS FOR CHRONIC PAIN

- 1 Nonpharmacologic therapy and nonopioid pharmacologic therapy are preferred for chronic pain. Clinicians should consider opioid therapy only if expected benefits for both pain and function are anticipated to outweigh risks to the patient. If opioids are used, they should be combined with nonpharmacologic therapy and nonopioid pharmacologic therapy, as appropriate.
- 2 Before starting opioid therapy for chronic pain, clinicians should establish treatment goals with all patients, including realistic goals for pain and function, and should consider how opioid therapy will be discontinued if benefits do not outweigh risks. Clinicians should continue opioid therapy only if there is clinically meaningful improvement in pain and function that outweighs risks to patient safety.
- 3 Before starting and periodically during opioid therapy, clinicians should discuss with patients known risks and realistic benefits of opioid therapy and patient and clinician responsibilities for managing therapy.

CLINICAL REMINDERS

- Opioids are not first-line or routine therapy for chronic pain
- Establish and measure goals for pain and function
- Discuss benefits and risks and availability of nonopioid therapies with patient

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

LEARN MORE | www.cdc.gov/drugoverdose/prescribing/guideline.html

Value: Provide evidence based clinical guidance to clinicians for effective treatment of pain, help determine need for opioids, and if opioids are prescribed, minimize risk for opioid misuse, overdose and death

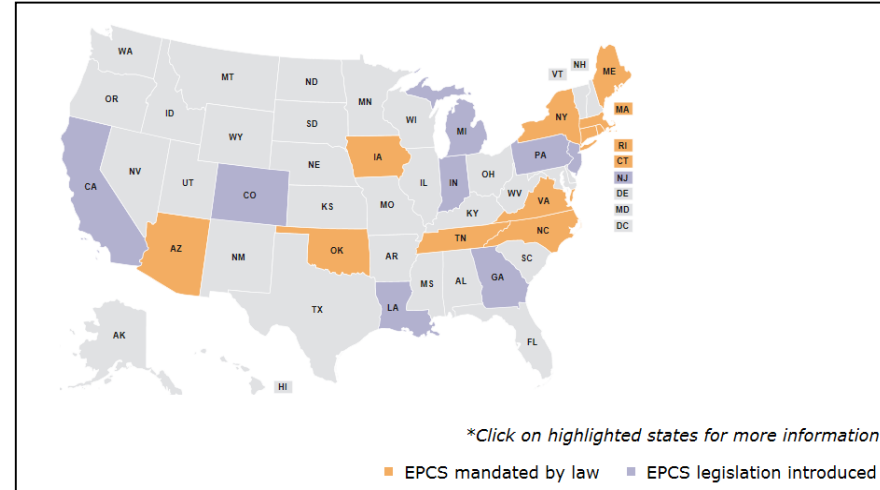
Keys to success: integrate within clinician workflow, easy to use, trusted source, actionable,

Electronic Prescribing Controlled Substances (EPCS)

e-Prescribing of non controlled substances is common...EPCS adoption is low

EPCS STATE RANKINGS

2017 Rank	2016 Rank	State	Pharmacy Enablement	Prescriber Enablement	Controlled Substances Prescribed Electronically
1	1	New York	97.8%	74.8%	93.8%
2	2	North Dakota	98.2%	40.9%	57.0%
3	25	Maine	99.3%	51.0%	41.2%
4	3	South Dakota	96.2%	30.2%	37.3%
5	7	Minnesota	95.9%	26.4%	34.2%
Nationwide			93.1%	22.0%	18.8%



Source: National Progress Report, 2017, Surescripts

Source: imprivata

Value: Reduce drug diversion

Keys to success: integrate within clinician workflow, rapid and efficient two factor authentication

Current Challenge: low provider adoption (cost is significant barrier), few states mandate

Value

- Monitor opioid prescribing patterns and identify inappropriate prescribing, monitor local opioid overdose rates and patterns.
- Predictive analytics models that identify patients at risk for chronic opioid use at point of prescribing.

Keys to success

- Meaningful data, integration within an opioid prescribing quality improvement program, predictive model integrated within clinician workflow

Examples

➤ **Clinical Decision Support**

- CDS Hooks using CDC Chronic Opioid Prescribing Guidelines

➤ **Analytics**

- Opioid Prescribing and Overdose Patterns
- Predictive Analytics


CDC Opioid Prescribing Guidelines

52 Pages


1 Page...still a lot to consider

Centers for Disease Control and Prevention
MMWR Morbidity and Mortality Weekly Report
 Recommendations and Reports / Vol. 65 / No. 1 March 18, 2016

CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016



Continuing Education Examination available at <http://www.cdc.gov/mmwr/cme/conted.html>.




U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Checklist for prescribing opioids for chronic pain

For primary care providers treating adults (18+) with chronic pain ≥3 months, excluding cancer, palliative, and end-of-life care

CHECKLIST	REFERENCE
<p>When CONSIDERING long-term opioid therapy</p> <ul style="list-style-type: none"> <input type="checkbox"/> Set realistic goals for pain and function based on diagnosis (eg, walk around the block). <input type="checkbox"/> Check that non-opioid therapies tried and optimized. <input type="checkbox"/> Discuss benefits and risks (eg, addiction, overdose) with patient. <input type="checkbox"/> Evaluate risk of harm or misuse. <ul style="list-style-type: none"> • Discuss risk factors with patient. • Check prescription drug monitoring program (PDMP) data. • Check urine drug screen. <input type="checkbox"/> Set criteria for stopping or continuing opioids. <input type="checkbox"/> Assess baseline pain and function (eg, PEG scale). <input type="checkbox"/> Schedule initial reassessment within 1–4 weeks. <input type="checkbox"/> Prescribe short-acting opioids using lowest dosage on product labeling; match duration to scheduled reassessment. <p>If RENEWING without patient visit</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check that return visit is scheduled ≤3 months from last visit. <p>When REASSESSING at return visit</p> <p><i>Continue opioids only after confirming clinically meaningful improvements in pain and function without significant risks or harm.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Assess pain and function (eg, PEG); compare results to baseline. <input type="checkbox"/> Evaluate risk of harm or misuse: <ul style="list-style-type: none"> • Observe patient for signs of over-sedation or overdose risk. <ul style="list-style-type: none"> – If yes: Taper dose. • Check PDMP. • Check for opioid use disorder if indicated (eg, difficulty controlling use). <ul style="list-style-type: none"> – If yes: Refer for treatment. <input type="checkbox"/> Check that non-opioid therapies optimized. <input type="checkbox"/> Determine whether to continue, adjust, taper, or stop opioids. <input type="checkbox"/> Calculate opioid dosage morphine milligram equivalent (MME). <ul style="list-style-type: none"> • If ≥50 MME/day total (≥50 mg hydrocodone; ≥33 mg oxycodone), increase frequency of follow-up; consider offering naloxone. • Avoid ≥90 MME/day total (≥90 mg hydrocodone; ≥60 mg oxycodone), or carefully justify; consider specialist referral. <input type="checkbox"/> Schedule reassessment at regular intervals (≤3 months). 	<p>EVIDENCE ABOUT OPIOID THERAPY</p> <ul style="list-style-type: none"> • Benefits of long-term opioid therapy for chronic pain not well supported by evidence. • Short-term benefits small to moderate for pain; inconsistent for function. • Insufficient evidence for long-term benefits in low back pain, headache, and fibromyalgia. <p>NON-OPIOID THERAPIES</p> <p>Use alone or combined with opioids, as indicated.</p> <ul style="list-style-type: none"> • Non-opioid medications (eg, NSAIDs, TCAs, SNRIs, anti-convulsants). • Physical treatments (eg, exercise therapy, weight loss). • Behavioral treatment (eg, CBT). • Procedures (eg, intra-articular corticosteroids). <p>EVALUATING RISK OF HARM OR MISUSE</p> <p>Known risk factors include:</p> <ul style="list-style-type: none"> • Illegal drug use; prescription drug use for nonmedical reasons. • History of substance use disorder or overdose. • Mental health conditions (eg, depression, anxiety). • Sleep-disordered breathing. • Concurrent benzodiazepine use. <p>Urine drug testing. Check to confirm presence of prescribed substances and for undisclosed prescription drug or illicit substance use.</p> <p>Prescription drug monitoring program (PDMP): Check for opioids or benzodiazepines from other sources.</p> <p>ASSESSING PAIN & FUNCTION USING PEG SCALE</p> <p>PEG score = average 3 individual question scores (0% improvement from baseline is clinically meaningful)</p> <p>01: What number from 0–10 best describes your pain in the past week? 0 = “no pain”; 10 = “worst you can imagine”</p> <p>02: What number from 0–10 describes how, during the past week, pain has interfered with your enjoyment of life? 0 = “not at all”; 10 = “complete interference”</p> <p>03: What number from 0–10 describes how, during the past week, pain has interfered with your general activity? 0 = “not at all”; 10 = “complete interference”</p>



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

TO LEARN MORE | www.cdc.gov/drugoverdose/prescribing/guideline

Example: When to Consider Naloxone

Checklist for prescribing opioids for chronic pain

For primary care providers treating adults (18+) with chronic pain ≥3 months, excluding cancer, palliative, and end-of-life care

CHECKLIST

When CONSIDERING long-term opioid therapy

- Set realistic goals for pain and function based on diagnosis (eg, walk around the block).
- Check that non-opioid therapies tried and optimized.
- Discuss benefits and risks (eg, addiction, overdose) with patient.
- Evaluate risk of harm or misuse.
 - Discuss risk factors with patient.
 - Check prescription drug monitoring program (PDMP) data.
 - Check urine drug screen.
- Set criteria for stopping or continuing opioids.
- Assess baseline pain and function (eg, PEG scale).
- Schedule initial reassessment within 1-4 weeks.
- Prescribe short-acting opioids using lowest dosage on product labeling; match duration to scheduled reassessment.

If RENEWING without patient visit

- Check that return visit is scheduled ≤3 months from last visit.

When REASSESSING at return visit

Continue opioids only after confirming clinically meaningful improvements in pain and function without significant risks or harm.

- Assess pain and function (eg, PEG); compare results to baseline.
- Evaluate risk of harm or misuse:
 - Observe patient for signs of over-sedation or overdose risk.
 - If yes: Taper dose.
 - Check PDMP.
 - Check for opioid use disorder if indicated (eg, difficulty controlling use).
 - If yes: Refer for treatment.
- Check that non-opioid therapies optimized.
- Determine whether to continue, adjust, taper, or stop opioids.
- Calculate opioid dosage morphine milligram equivalent (MME).
 - If ≥50 MME/day total (≥50 mg hydrocodone; ≥33 mg oxycodone), increase frequency of follow-up; consider offering naloxone.
 - Avoid ≥90 MME/day total (≥90 mg hydrocodone; ≥60 mg oxycodone), or carefully justify; consider specialist referral.
- Schedule reassessment at regular intervals (≤3 months).

REFERENCE

EVIDENCE ABOUT OPIOID THERAPY

- Benefits of long-term opioid therapy for chronic pain not well supported by evidence.
- Short-term benefits small to moderate for pain; inconsistent for function.
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NON-OPIOID THERAPIES

- Use alone or combined with opioids, as indicated.
- Non-opioid medications (eg, NSAIDs, TCAs, SNRIs, anti-convulsants).
- Physical treatments (eg, exercise therapy, weight loss).
- Behavioral treatment (eg, CBT).
- Procedures (eg, intra-articular corticosteroids).

EVALUATING RISK OF HARM OR MISUSE

Known risk factors include:

- Illegal drug use, prescription drug use for nonmedical reasons.
- History of substance use disorder or overdose.
- Mental health conditions (eg, depression, anxiety).
- Sleep-disordered breathing.
- Concurrent benzodiazepine use.

Urine drug testing: Check to confirm presence of prescribed substances and for undisclosed prescription drug or illicit substance use.

Prescription drug monitoring program (PDMP): Check for opioids or benzodiazepines from other sources.

ASSESSING PAIN & FUNCTION USING PEG SCALE

PEG score = average 3 individual question scores (30% improvement from baseline is clinically meaningful)

- Q1: What number from 0-10 best describes your pain in the past week?
0="no pain", 10="worst you can imagine"
- Q2: What number from 0-10 describes how, during the past week, pain has interfered with your enjoyment of life?
0="not at all", 10="complete interference"
- Q3: What number from 0-10 describes how, during the past week, pain has interfered with your general activity?
0="not at all", 10="complete interference"

When REASSESSING at return visit

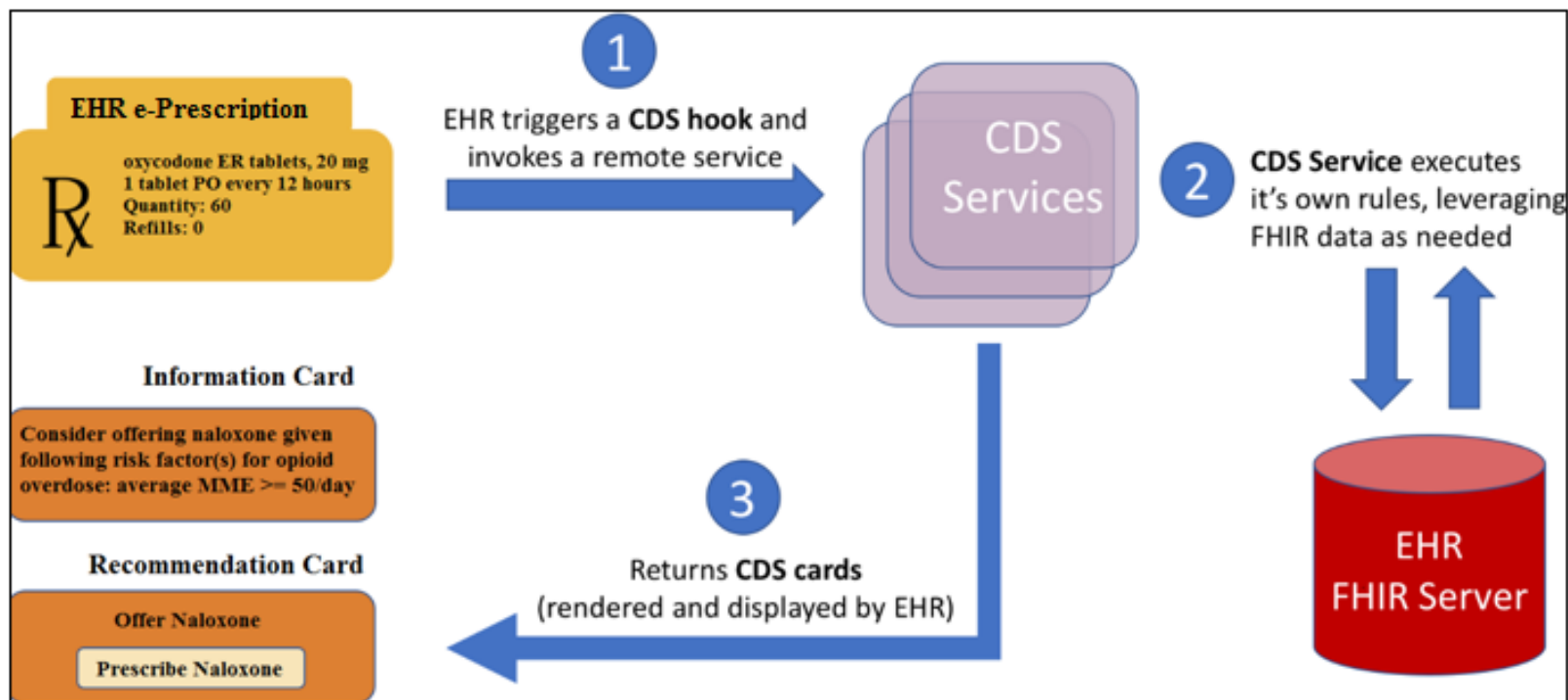
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- Schedule reassessment at regular intervals (≤3 months).



TO LEARN MORE | www.cdc.gov/drugoverdose/prescribing/guideline

Emerging HIT: Embedding CDC Opioid Prescribing Guidelines using FHIR

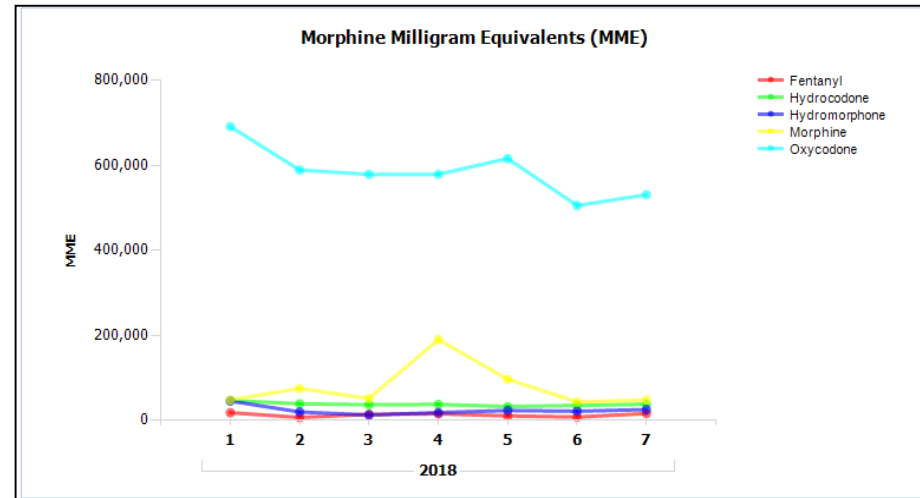
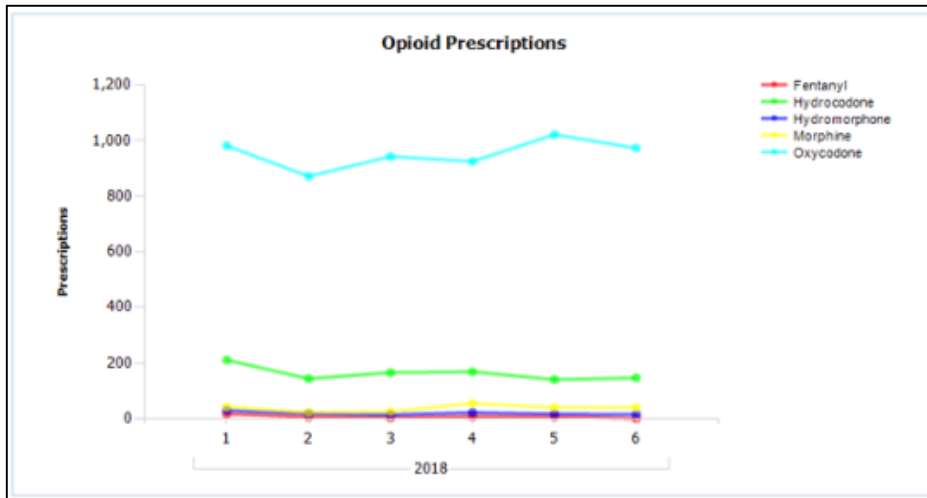


Value: identify possible care gap in real time using CDC guideline logic, show meaningful information and actionable recommendations, EHR agnostic

Keys to success: integrate within clinician workflow, easy to use, actionable, trusted

For more information see [CDC Opioid Prescribing Implementation Guide](#)

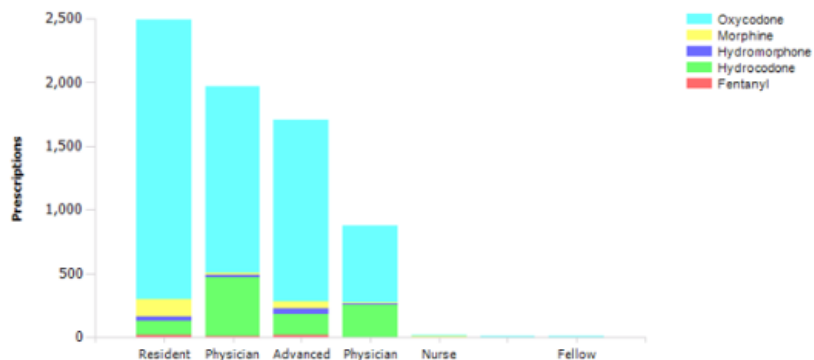
Opioid Prescriptions



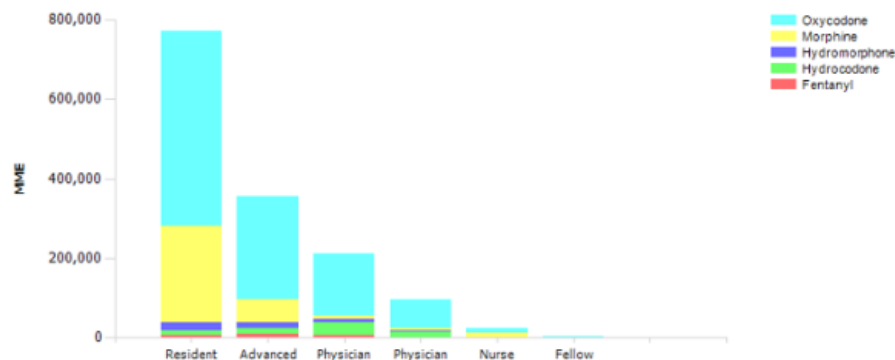
Gender	Age	Indication	Drug	Quantity	Duration	MME	MME/Day	Sig	Refills	Date	Prescriber
Male	48	pain	Percocet 5/325 oral tablet	5	0	38		1 tab(s) orally 4 times a day, As Needed	0	2/10/2018	
Male	35	for post-operative pain	oxycODONE-acetaminophen 5 mg-325 mg oral tablet	28	7	210	30	1 tab(s) orally every 6 hours x 7 days, As Needed -for severe pain	0	2/9/2018	
Male	52	for post-operative pain	oxycODONE-acetaminophen 5 mg-325 mg oral tablet	28	7	210	30	1 tab(s) orally every 6 hours x 7 days, As Needed -for severe pain	0	2/26/2018 3/2/2018 3/5/2018	
Male	66		oxycODONE-acetaminophen 5 mg-325 mg oral tablet	28	7	210	30	1 tab(s) orally every 6 hours x 7 days, As Needed -for severe pain	0	2/7/2018	
Male	44		oxycODONE-acetaminophen 5 mg-325 mg oral tablet	28	7	210	30	1 tab(s) orally every 6 hours, As Needed -for severe pain	0	2/3/2018	
Female	31		oxycODONE-acetaminophen 5 mg-325 mg oral tablet	28	7	210	30	1 tab(s) orally every 6 hours, As Needed -for severe pain	0	2/3/2018	
Female	38		Percocet 5/325 oral tablet	2	2	15	8	1 tab(s) orally once a day (at bedtime)	0	2/5/2018	
Male	58		oxycODONE-acetaminophen 5 mg-325 mg oral tablet	15	0	113		1 tab(s) orally every 8 hours, As Needed for severe pain	0	2/8/2018	
Male	58		oxycODONE-acetaminophen 5 mg-325 mg oral tablet	8	2	60	30	1 tab(s) orally every 6 hours	0	2/6/2018	

Opioid Prescribers

Prescriptions by Prescriber Type

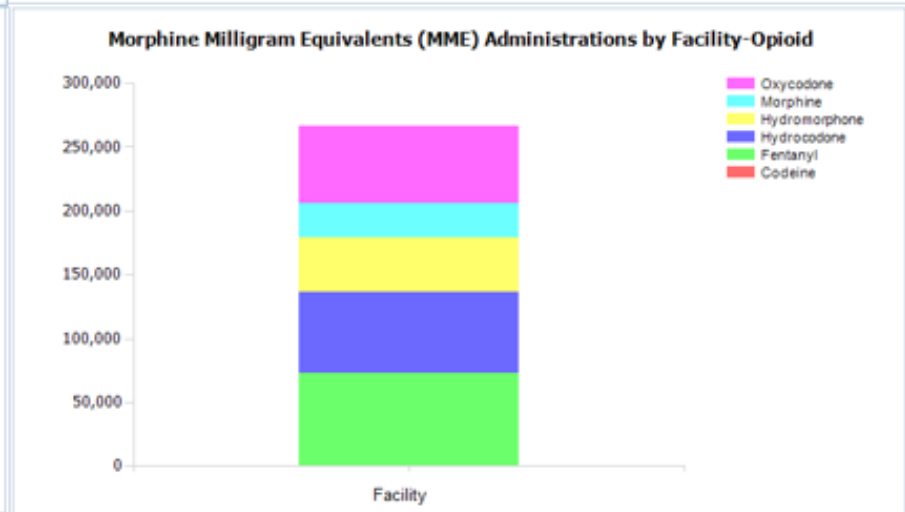
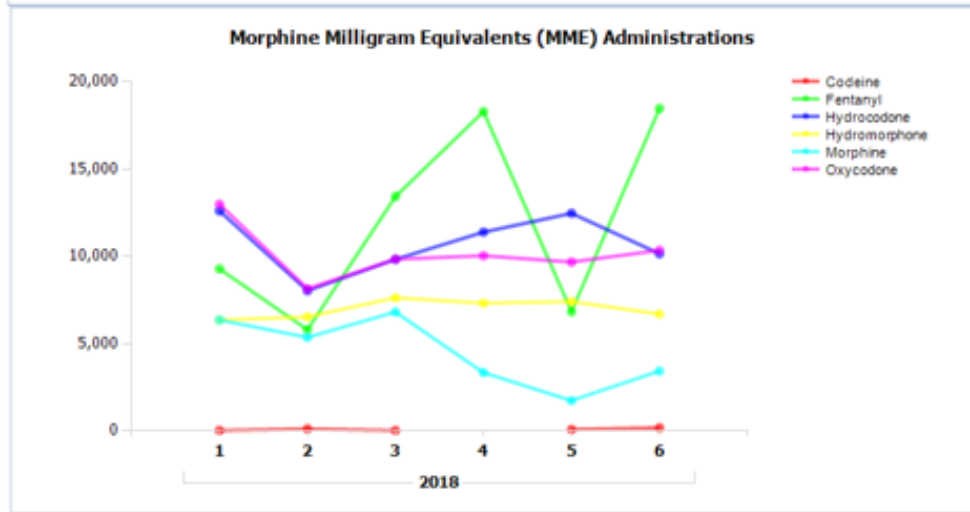
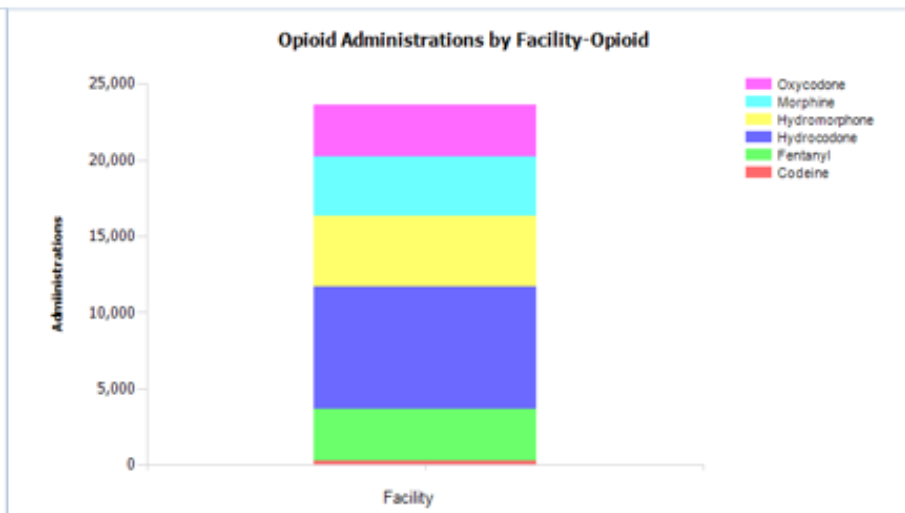
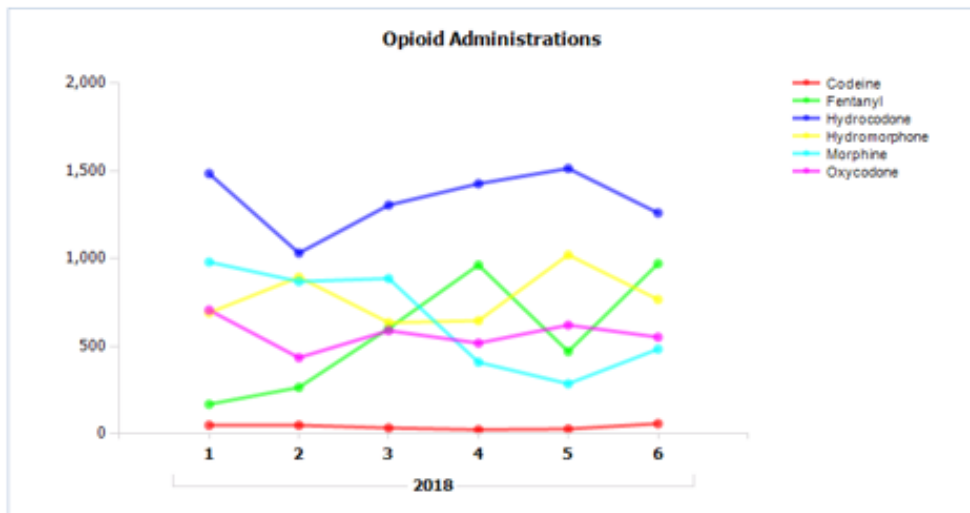


Morphine Milligram Equivalents (MME) by Prescriber Type

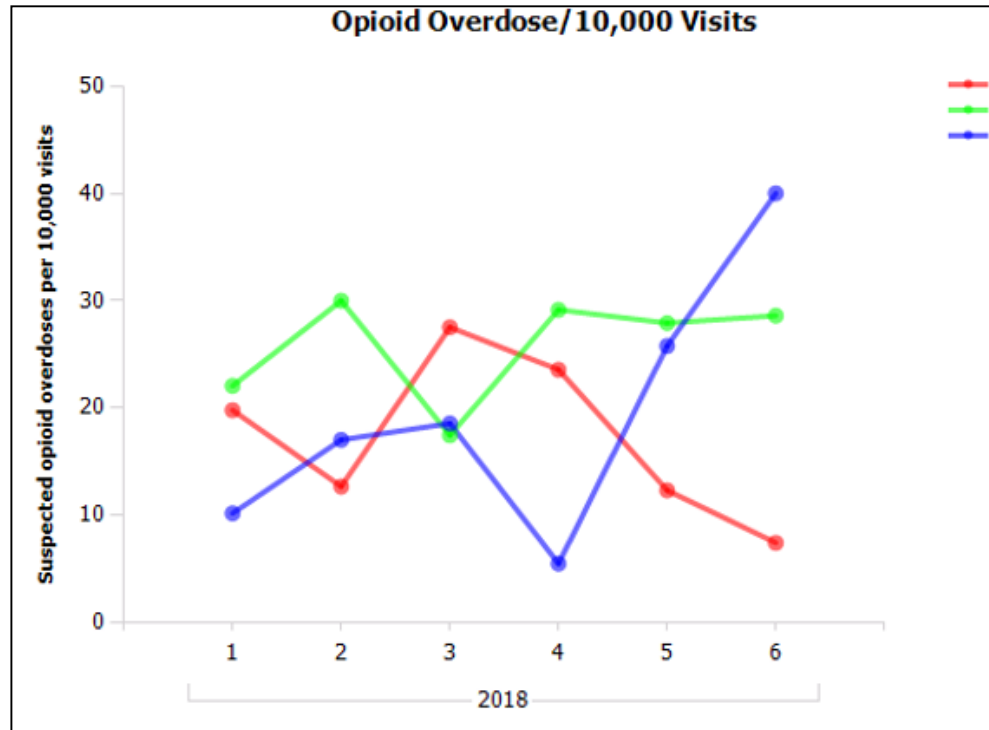


Prescriber	Discipline	Prescriptions	Prescriptions by Opioid	Prescriptions	Average Quantity / Prescription	Average MME/Prescription
279		308				
204		308				
195		308				

Opioid Administration (Inpatient)

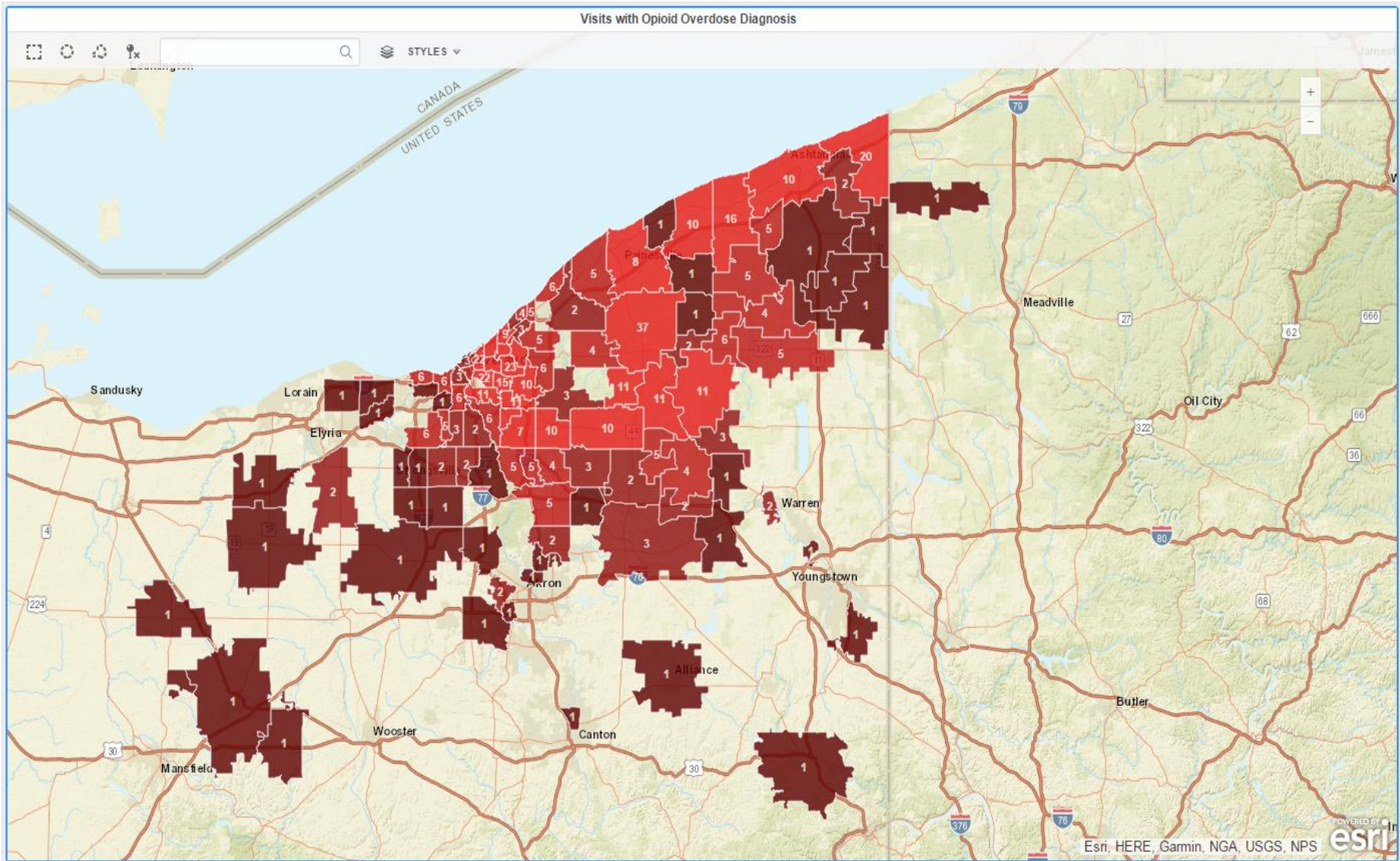


Local Opioid Overdose Rates



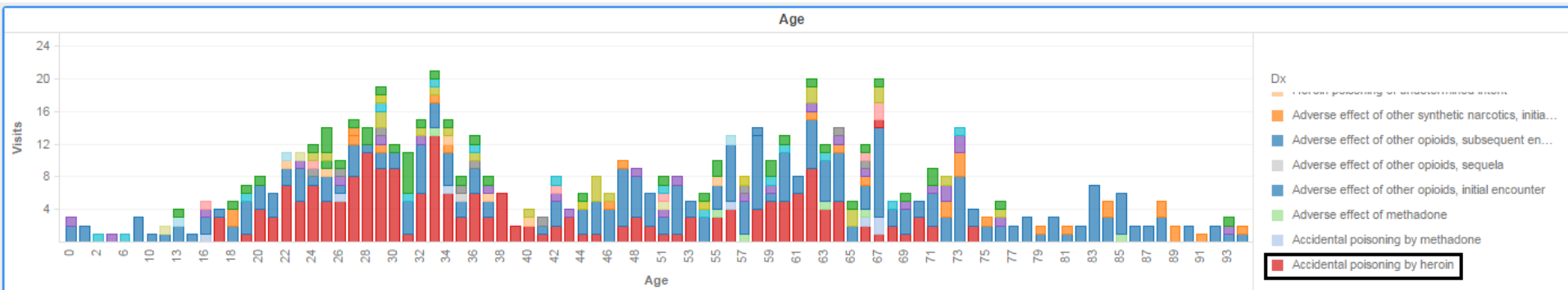
- Health systems can monitor and use to target interventions to reduce risk of repeat overdose, which may differ between subsets of patients
- Prescribers might change opioid prescribing practice when informed of patient overdose or death [Opioid prescribing decreases after learning of a patient's fatal overdose](#) **SCIENCE** 10 AUG 2018 : 588-590
- Can assist health departments to identify increases in opioid overdoses more quickly and coordinate response efforts

Opioid Overdose Distribution

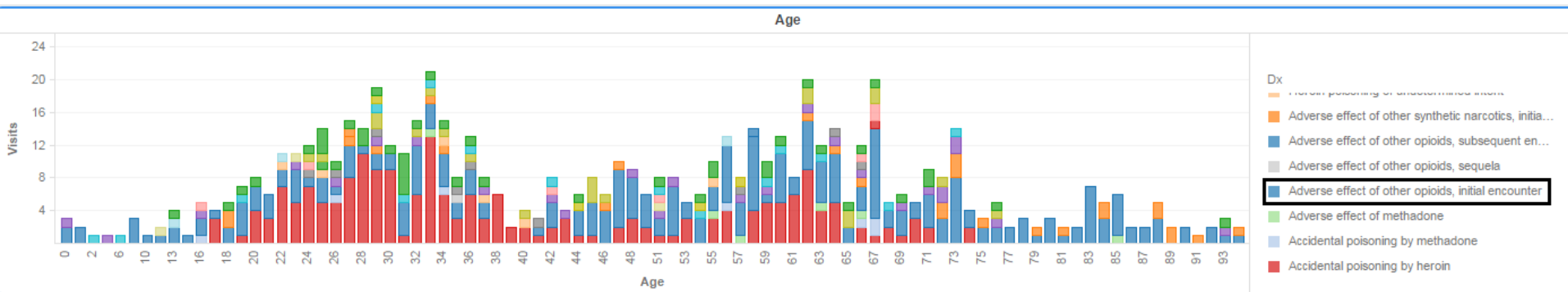


Opioid Overdose Diagnosis by Age

Heroin Overdose: Predominantly Young, middle age



Adverse Effect of Other Opioids, Initial Encounter: Predominately Middle Age, Elderly



Opioid Overdose Visit Details and Timeline

Encounter #	Facility	First	Last	Zip Code	Age	Gender	Race	Ethnicity	Marital Status	Visit Date	LOS (days)	Dispo	Dx	Dx Code	Dx Type	
					49	Female	White	Not Hispanic	Married	1/27/2018	2	.Home	Adverse effect of other opioids, initial encounter	T40.2X5A	Final Sec Dx	Timeline
					29	Male	Black/African American	Not Hispanic	Single	2/10/2018	5	Skilled Nursing Facility	Adverse effect of other synthetic narcotics, initial encounter	T40.4X5A	Final Sec Dx	Timeline
					20	Male	White	Non-Hispanic	Single	2/24/2018	2	.Home	Accidental poisoning by heroin	T40.1X1A	Final Princpl Dx	Timeline
					64	Female	Black/African American	Not Hispanic	Single	1/1/2018	1	Short Term Inpatient Hospital	Accidental poisoning by heroin	T40.1X1A	ER Fnl Princ Dx	Timeline
					21	Female	White	Non-Hispanic	Married	1/1/2018	1	.Home	Adverse effect of other opioids, initial encounter	T40.2X5A	Final Sec Dx	Timeline
					66	Male	White	Not Hispanic	Married	1/2/2018	1	.Home	Adverse effect of other opioids, initial encounter	T40.2X5A	Final Sec Dx	Timeline
					42	Male	Black/African American	Not Hispanic	Single	1/2/2018	18	.Home	Opioid overdose	T40.2X1A	Final Sec Dx	Timeline

Opioid Timeline		Encounter Number: <input type="text"/>					
Date/Time	Hours Since Admit	Hour	Event	Description	MME	Event Location	Order Set
1/30/2018 11:16:00 PM		0.8	23 Admission	Admission			
1/31/2018 12:21:00 AM		1.1	0 Naloxone Administration	Naloxone Injectable, 2 mg		Adult ED	
1/31/2018 12:29:00 AM		1.2	0 Naloxone Administration	Naloxone Injectable, 2 mg		Adult ED	
1/31/2018 4:33:00 AM		5.3	4 Discharge	Discharge (.Home)			
2/4/2018 3:12:55 AM		99.9	3 Diagnosis	Accidental poisoning by heroin (ER Fnl Princ Dx)			

Emerging HIT: Predictive Analytics



Data Capture

Initial Data Sources
EHRs, claims

Expanded Data Sources
genomics, social media,
ancestry, environmental



Model Creation

Rules Engine
Evidence based

"Big Data" Tools
Machine learning,
statistical tools,
validate algorithms



Model Application

Utilize claims & clinical
Manage outcomes

Integrate predictive models
Identify pre-disease
populations



Point of Care Use

For caregivers
Point of care clinical
decision support tools

For patients
Patient Portal
Other: e.g. Apple Health
App

Predictive Analytics Model Example



Prediction of Future Chronic Opioid Use Among Hospitalized Patients

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BACKGROUND: Opioids are commonly prescribed in the hospital; yet, little is known about which patients will progress to chronic opioid therapy (COT) following discharge. We defined COT as receipt of \geq 90-day supply of opioids with $<$ 30-day gap in supply over a 180-day period or receipt of \geq 10 opioid prescriptions over 1 year. Predictive tools to identify hospitalized patients at risk for future chronic opioid use could have clinical utility to improve pain management strategies and patient education during hospitalization and discharge.

OBJECTIVES: The objective of this study was to identify a parsimonious statistical model for predicting future COT among hospitalized patients not on COT before hospitalization.

DESIGN: Retrospective analysis electronic health record (EHR) data from 2008 to 2014 using logistic regression.

PATIENTS: Hospitalized patients at an urban, safety net hospital.

MAIN MEASUREMENTS: Independent variables included medical and mental health diagnoses, substance and tobacco use disorder, chronic or acute pain, surgical intervention during hospitalization, past year receipt of opioid or non-opioid analgesics or benzodiazepines, opioid receipt at hospital discharge, milligrams of morphine equivalents prescribed per hospital day, and others.

KEY RESULTS: Model prediction performance was estimated using area under the receiver operator curve, accuracy, sensitivity, and specificity. A model with 13 covariates was chosen using stepwise logistic regression on a randomly down-sampled subset of the data. Sensitivity and specificity were optimized using the Youden's Index. This model predicted correctly COT in 79% of the patients and no COT correctly in 78% of the patients.

CONCLUSIONS: Our model accessed EHR data to predict 79% of the future COT among hospitalized patients. Application of such a predictive model within the EHR could identify patients at high risk for future chronic opioid use to allow clinicians to provide early patient education

about pain management strategies and, when able, to wean opioids prior to discharge while incorporating alternative therapies for pain into discharge planning.

KEY WORDS: hospital medicine; statistical modeling; prediction risks.

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BACKGROUND

The USA is facing an unprecedented opioid epidemic. According to data from the 2015 National Survey of Drug Use and Health, over two million people had a prescription opioid use disorder.¹ People who were uninsured, unemployed, or had lower family incomes reported higher rates of opioid use, misuse, or opioid use disorder.² Opioid prescribing for chronic pain can be challenging to clinicians who have little training in addiction or managing patients who misuse their opioid medications.³ Risk factors for opioid misuse among people on chronic opioid therapy (COT) include a history of substance use disorder, younger age, increased healthcare utilization, and depression or anxiety.⁴ Predictive tools identify patients at risk of aberrant drug-related behavior⁵⁻⁸ and assist with diagnosing addiction in patients on COT.⁹ Tools to identify patients at risk of becoming chronic opioid users for both acute and chronic pain are lacking. This is particularly important in the hospital where opioids are commonly prescribed for pain.¹⁰ Opioid receipt at hospital discharge has been shown to be associated with an increased risk of chronic opioid use.¹¹ Predictive tools to identify hospitalized patients at risk for future COT may have clinical utility to improve hospital-based pain management with a focus on limiting opioid prescribing when non-opioid analgesics, or other non-pharmaceutical options, may be effective for pain control.

There are several approaches to develop a predictive tool. Traditional models, such as logistic regression, have been used to identify risk factors for COT.^{5, 12-14} Modern methods for prediction include non-parametric and tree-based methods that can handle large amounts of data available in the electronic health record (EHR).^{15, 16} These methods are comparable to

- Data source: EHR
- Identified 79% of future chronic opioid users
- “The model could be easily integrated into the clinical workflow to alert physicians when a patient is at high-risk for COT.”

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Thank You!

Questions

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