



Using Electronic Health Record Data to Identify Chronic Opioid Use in Patients with Osteoarthritis

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Chronic Opioid Use Should be Avoided

- Opioids can be useful to manage short term pain
- For long term pain therapy, opioids are no more effective than safer therapies (e.g., NSAIDs) for osteoarthritis (OA) patients¹
- Nearly 25% of OA patients may receive opioids within a given year²
- Identifying patients with chronic opioid use is challenging
 - No commonly agreed upon definition of “chronic”
 - Definitions rely on pharmacy fill data (claims)
 - Electronic health record (EHR) systems lack claims data

Study Objective

Use commonly available EHR variables to identify patients with chronic opioid use.

Data Availability

Relevant information is often missing from EHR data, or captured in free text fields that are troublesome to reference.

EHR	Claims	Variable
✓	✓	Type of prescription
✓	✓	Date of prescription
✗	✓	Dosage
✗	✓	Number of days supplied

Goals

- Simple to implement and communicate
- Clinically defensible, driven by real world data
- Consistent with existing definitions

Methods

Study Population

27,034 adults (18-89) with OA across 16 healthcare organizationst

- 16,147 patients had EHR and Claims data (direct comparison set)
- Index on first non-tramadol opioid Rx (03/01/2017 – 02/28/2019)
- No opioid prescription for 6 months prior to index prescription
- Opioids may be prescribed for any reason (not limited to OA)

Reference Definition

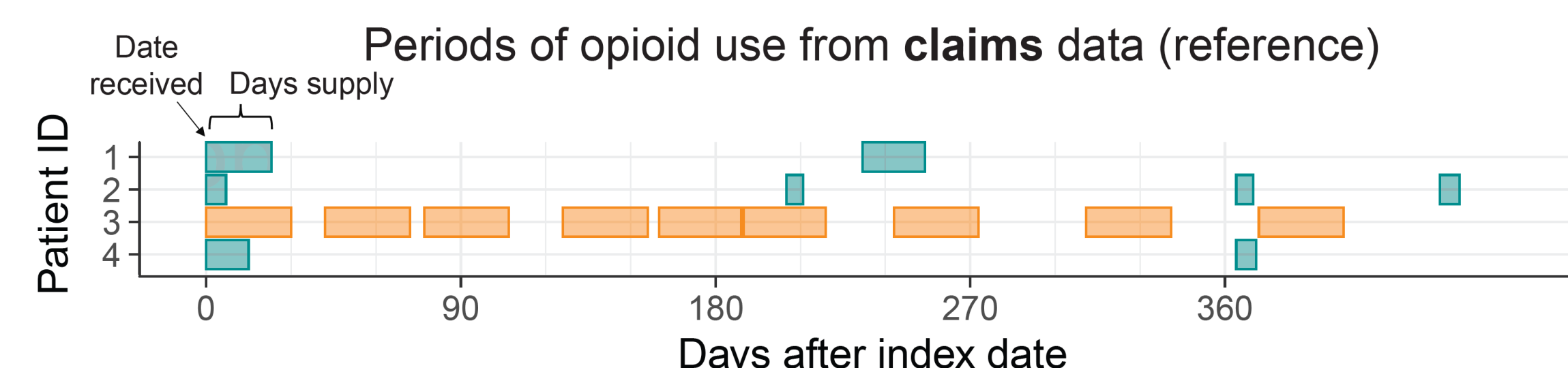
Selected most highly cited reference definition based on scoping literature review to serve as a reference for new definition development.³

- 90 days worth of opioid supply
- Maximum gap in supply less than 30 days
- At least 3 different prescriptions

Results

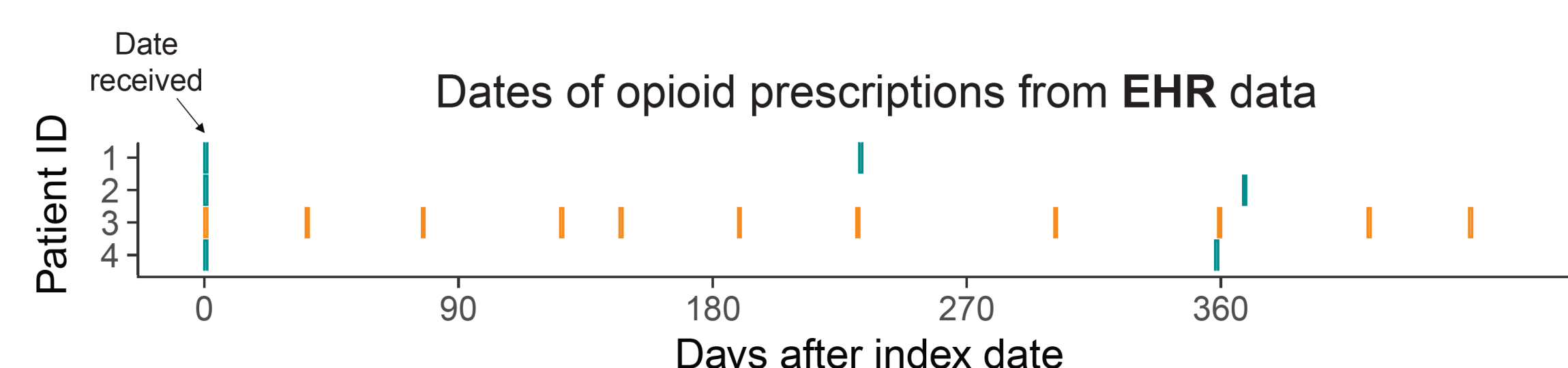
1. Use claims data to identify patients with chronic use

- Access to date of fill and days supplied
- Chronic use:** 90 days supplied, from 3+ Rx
- Patient 3 has a pattern of chronic use

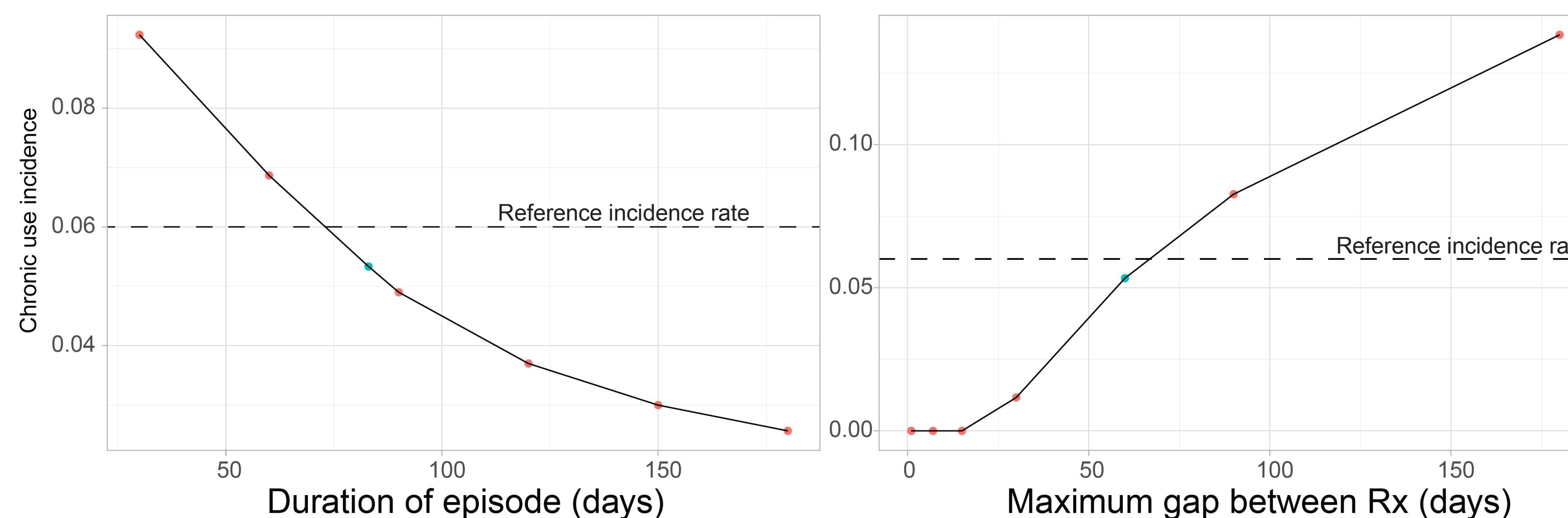


2. Identify the same patients using EHR data alone

- Access to date of Rx only
- Chronic use:** rely on pattern of prescriptions
- Patient 3 still has a pattern of chronic use



3. Evaluate multiple patterns against reference definition



- Operationalized as **total duration** and **gap between consecutive Rx**
- Values were selected based on clinical relevance (e.g., 30 days is a typical max Rx duration) rather than freely chosen
- Incidence was compared for each cut point against the **reference incidence rate from claims data**

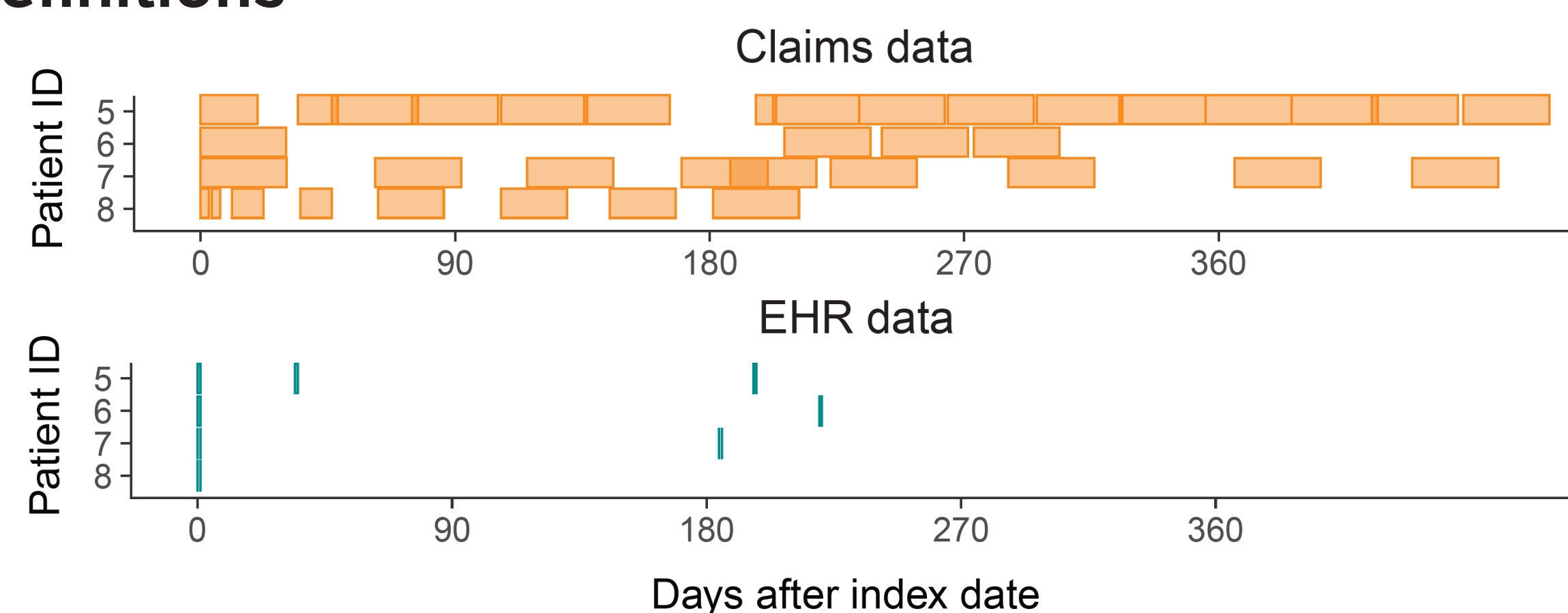
- Definitions were compared on a case by case basis for each patient
- Adjudicated claims:** new definition was applied to adjudicated claims data (pharmacy fills) to compare like-with-like
- EHR:** new definition was applied to EHR data from the same patients, which may miss some prescriptions

Definition	Data Source	Incidence	Sens.	Spec.	PPV	NPV
Dunn et al. 2010 90 days continuous supply	Adjudicated claims	6.0%	-	-	-	-
EHR chronic use definition ≥3 Rx, 84 days duration, max gap 60 days	Adjudicated claims	7.4%	82.2%	97.4%	67.0%	98.8%
	EHR	5.3%	52.2%	97.7%	59.1%	97.0%

Sens: Sensitivity; Spec: Specificity; PPV: Positive predictive value; NPV: Negative predictive value. All metrics calculated against reference definition

4. Investigate discrepancies between definitions

- When the two definitions disagreed, it was often due to missing prescriptions in the EHR data
- Data limitation, cannot be addressed by adjusting the definition
- Potential explanations: multiple Rx on a single day (filled over months), Rx received from multiple health systems



Approach



Data Driven Development

- Evaluate prescription patterns
- Compare data sources (EHR vs. claims)
- Quantitatively compare definitions

Incorporate Clinical Expert Feedback

- Solicit feedback from practicing addiction specialist
- Judge face validity: capture “spirit” of chronic use
- Inform natural cut points

Conclusions

EHR definition of chronic opioid use

- 3 or more prescriptions
- No more than 60 days apart
- Spanning a period of at least 83 days

EHR definition is consistent with claims definition

EHR definition is self-contained, does not rely on outside claims data: can implement in a single system

Discrepancies between EHR and claims definition are often the result of missing prescriptions in EHR, which suggests some patients receive opioids from multiple sources

Key Takeaways

- Over 5% of OA patients experience a new period of chronic opioid use within a given year
- These patients can be identified using EHR data alone, allowing more timely intervention
- Missing data on opioids (e.g., receiving from outside source) may be a significant problem for many patients

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