

A pragmatic study of Clinical Decision Support to promote Prescription Drug Monitoring Program use



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WHAT WE LEARNED

User-centered design and silent CDS alert testing informs implementation decisions, validates monitoring tools, and enhances messaging and education

BACKGROUND

- Opioid analgesics are frequently prescribed despite the worsening national opioid crisis
- PDMPs have potential as a tool to improve opioid prescribing safety but are underutilized
- Clinical Decision Support (CDS) is a pragmatic, scalable intervention to improve care by modifying workflows to promotion of behavior change

OBJECTIVES

- To formatively assess the development and initial deployment of a pragmatic, user-centered CDS tool to facilitate PDMP use for high-risk patients

METHODS

- **Design:** User-centered design, development and piloting of new PDMP CDS to be deployed in cluster-randomized trial to evaluate implementation and patient outcomes. IRB approved.
- **Setting:** Large healthcare system >500k ED visits, >130k admissions and >3.5m outpatient visits/year
 - Academic, community, urban/suburban/rural
- **Participants:** End users and organizational leaders
 - 20 zoom interviews, 10 workflow observations
 - 3,639 providers randomized on study
- **Preparatory Phases:**
 - Needs assessment: interviews, pilot data
 - Design: best practices, expert opinion
 - Iterative revisions: user testing and feedback
 - Silent testing: Pilot data set, live in background
- **Providers/clinics randomized:** by # of visits and past year opioid prescribing to 4 arms of CDS alerts:
 1. Control: no alert
 2. Mandated: fires for all controlled meds, no risk criteria
 3. PDMP: PDMP high risk criteria triggers alert
 4. PDMP + EHR: PDMP and/or EHR high risk criteria triggers alert
- **Education/dissemination:** provided prior to deployment and as ongoing outreach

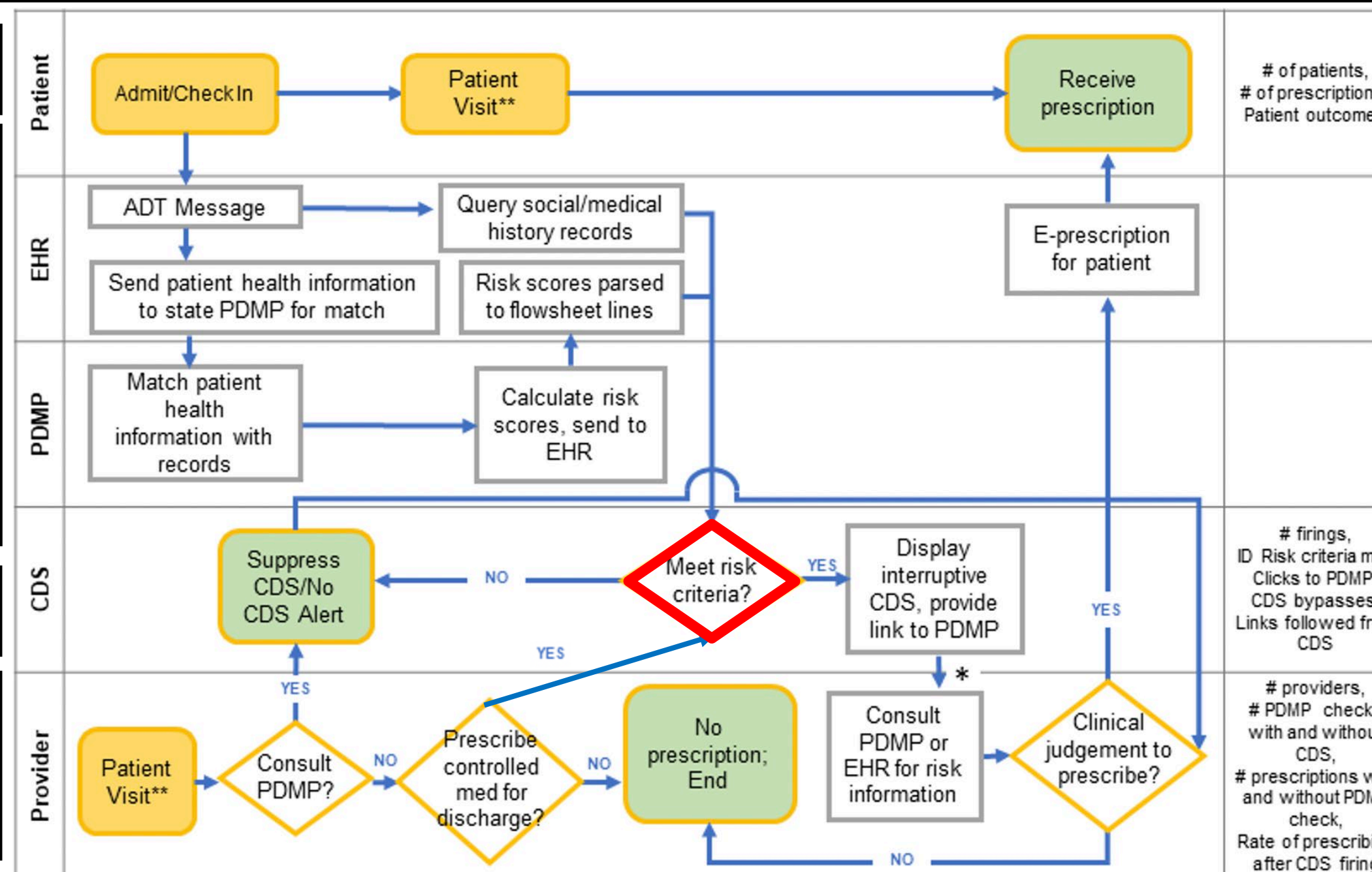


Fig 1. Process map

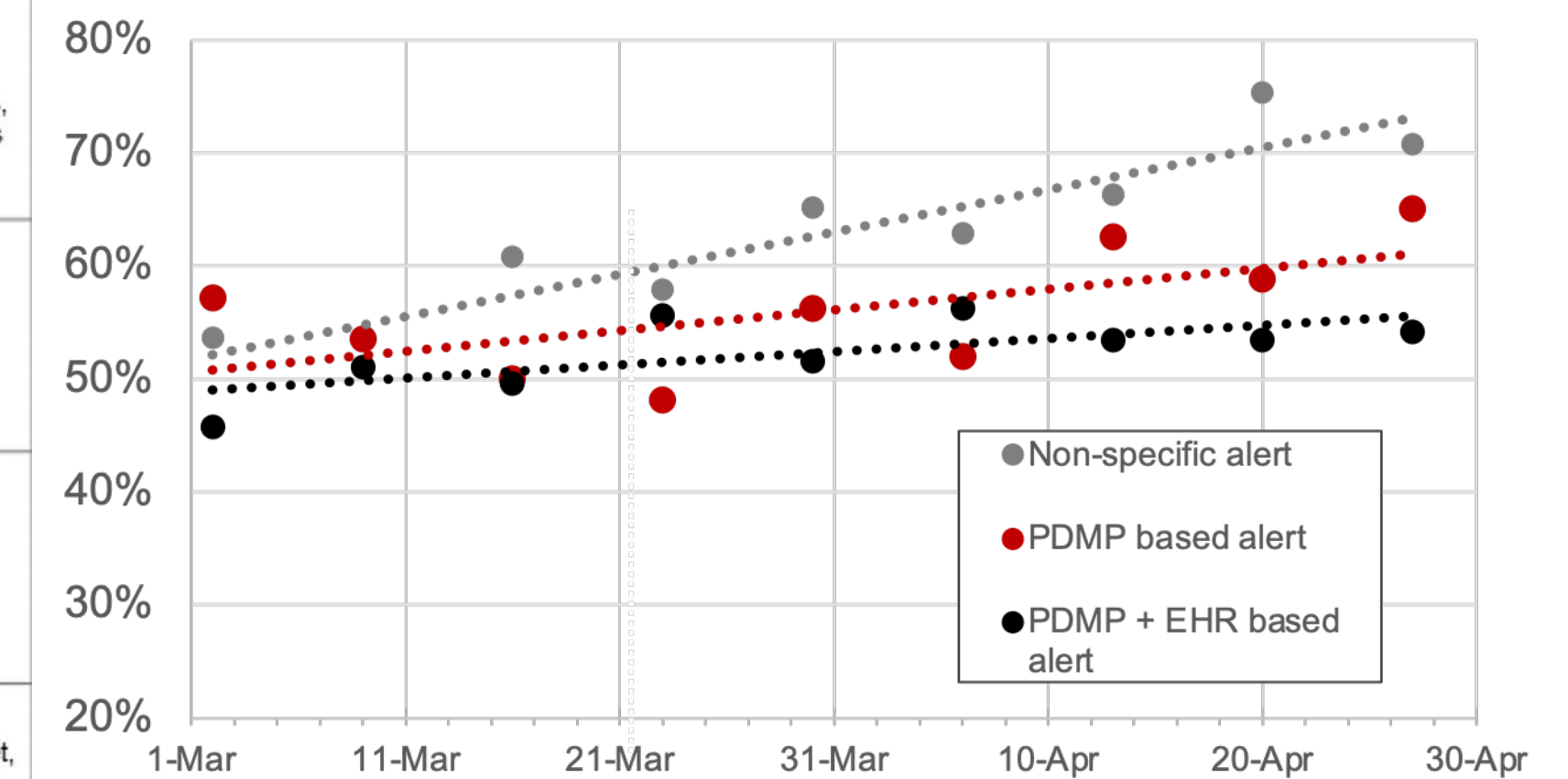


Fig 3: CDS Alert-linked PDMP use in hospital/ambulatory settings

RESULTS

- Key topics of import to users (→ solution):
 - Alert fatigue → ensure value in each message
 - Interruptive alerts → necessary when important for patient safety, return to normal workflow
 - Alert suppression → avoid duplicate work
 - Support → explanatory info available
- Outreach can accelerate adoption for late adopters
 - Direct emails resulted in improved alert use in 34/197 (17.3%) of providers contacted
- CDS alerts increase PDMP use
- Impacts on prescribing undetermined

LIMITATIONS

- Single system with local CDS build in EHR with informatics expertise
- Implementation and patient outcomes will be evaluated in pending cluster RCT

CONCLUSIONS

- Iterative, user centered design helps identify and address barriers to CDS adoption while engaging end users and influencers early
- Silent testing informs implementation decisions, validate monitoring tools, and quantifies CDS alert burden to provide context for CDS messaging, outreach and education

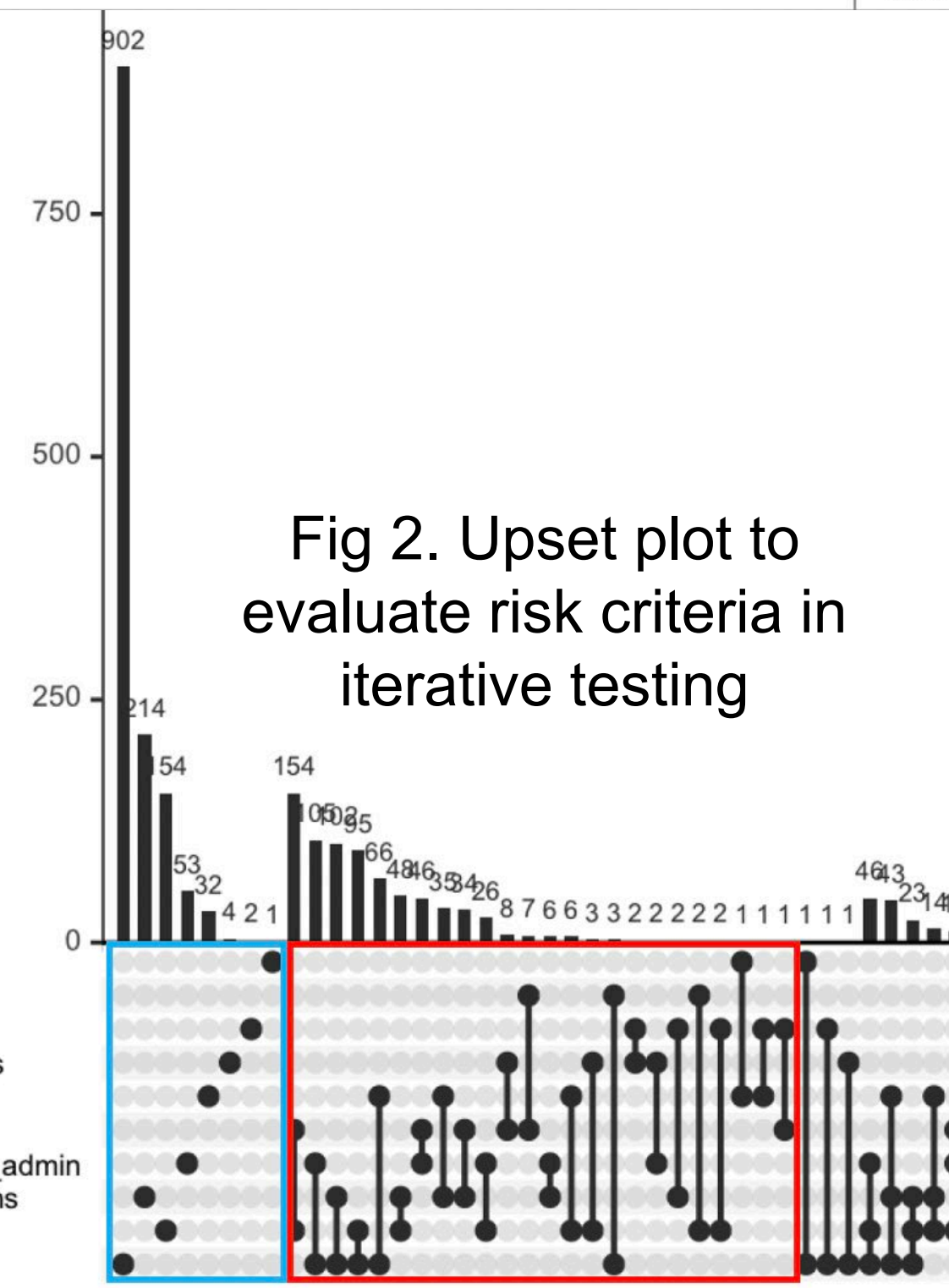


Fig 2. Upset plot to evaluate risk criteria in iterative testing

Results: Firing rates for 3 months of silent testing in ED

- **Mandated alert:** 8.1% (95%CI 7.9-8.3%), with variability across EDs (5.4-11.3%).
- **PDMP alert:** 2.8% (95%CI 2.7-3.0%) → reducing to 2.0% (95%CI 1.9-2.1%) after modifications
- **PDMP + EHR alert:** 4.2% (95%CI 4.1-4.4%) → decreased to 3.7% (95%CI 3.5-3.9%) after modifications
- Limitations in monitoring system design currently prevent accurate calculation of on-study firing rates