



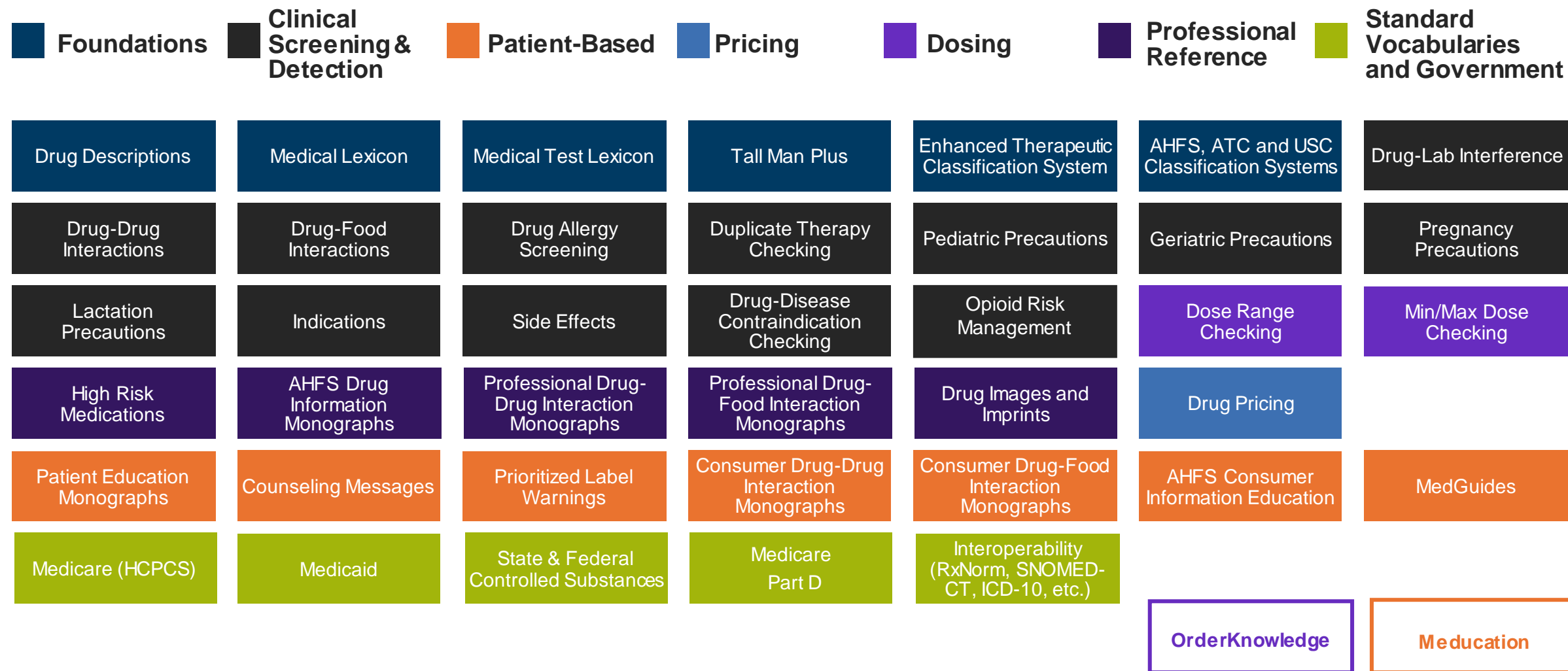
Successful Deployment of Contextualized Drug-Drug Interaction CDS

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FDB MedKnowledge

Breadth of Integrated Content for Medication Decision Support



Drug-Drug Interaction Sources Vary

Inclusion Policy and Grouper Granularity



2017

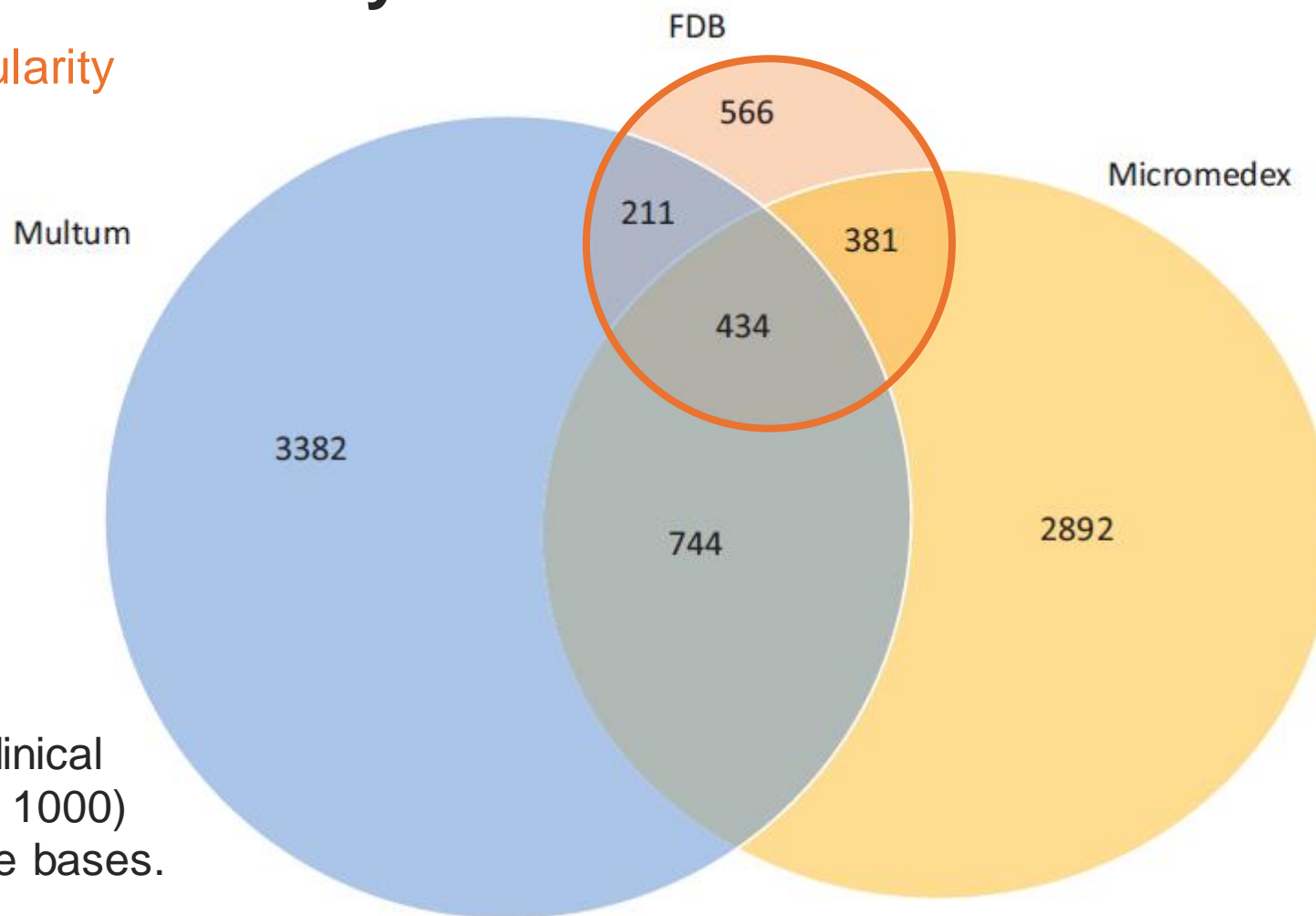


Figure 1. Overlap of clinical drug pairs (numbers in 1000) between the knowledge bases.

Fung KW, Kapusnik-Uner J, Cunningham J, Higby-Baker S, Bodenreider O. Comparison of three commercial knowledge bases for detection of drug-drug interactions in clinical decision support. J Am Med Inform Assoc. 2017 Feb 22. doi: 10.1093/jamia/ocx010. [Epub ahead of print] PubMed PMID: 28339701.

Challenges of Medication CDS Today



Alert Fatigue



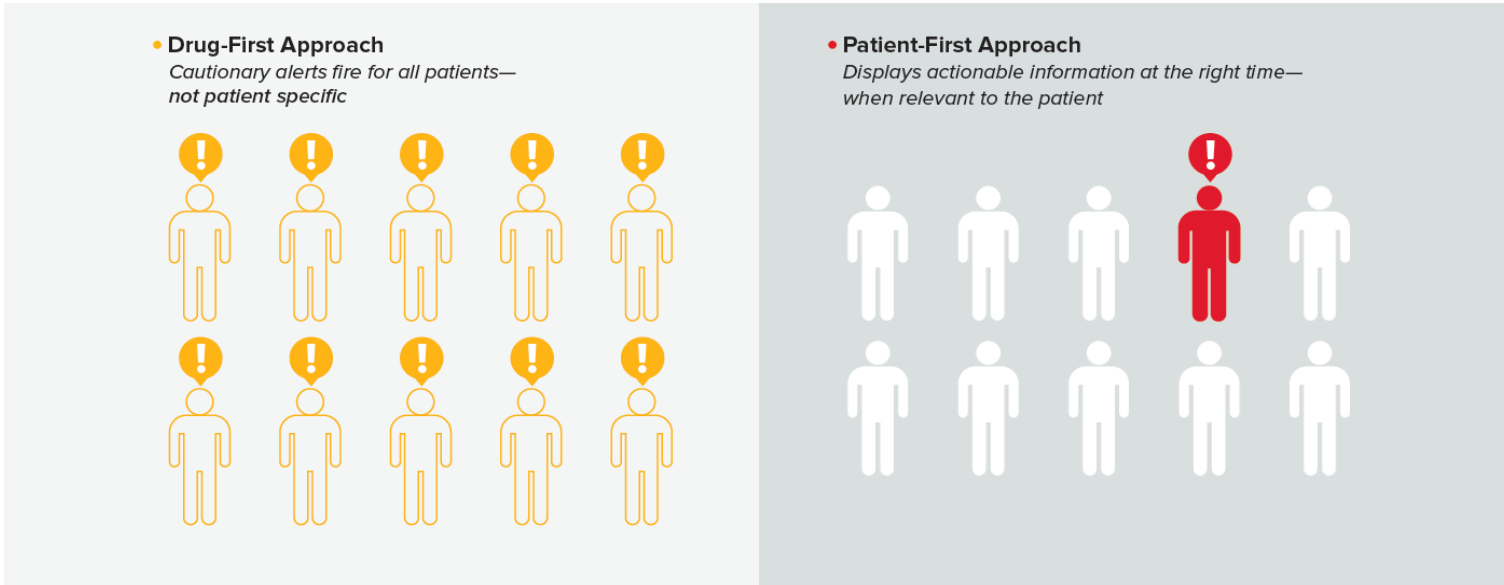
**Too Sensitive
Lack Specificity**



**Knowledge &
Rules-based**

- Is there a potential role for non-knowledge-based medication CDS?
- Could we leverage machine learning and associated technology (e.g. artificial neural networks) to uncover/discover risks?
- How might FDB support a non-knowledge-based CDS framework?

PatientFirst Care Guidance



“Although little discussed prior to the widespread use of electronic medical records, alert fatigue is now recognized as a **major unintended consequence** of the computerization of health care and a **significant patient safety hazard.**”
- Agency for Healthcare Research and Quality, 2019



AlertSpace

2012



Targeted Med Warnings

2019



Pharmacogenomics

2020



CDS Analytics

2021



Clinical Surveillance

Future

AlertSpace



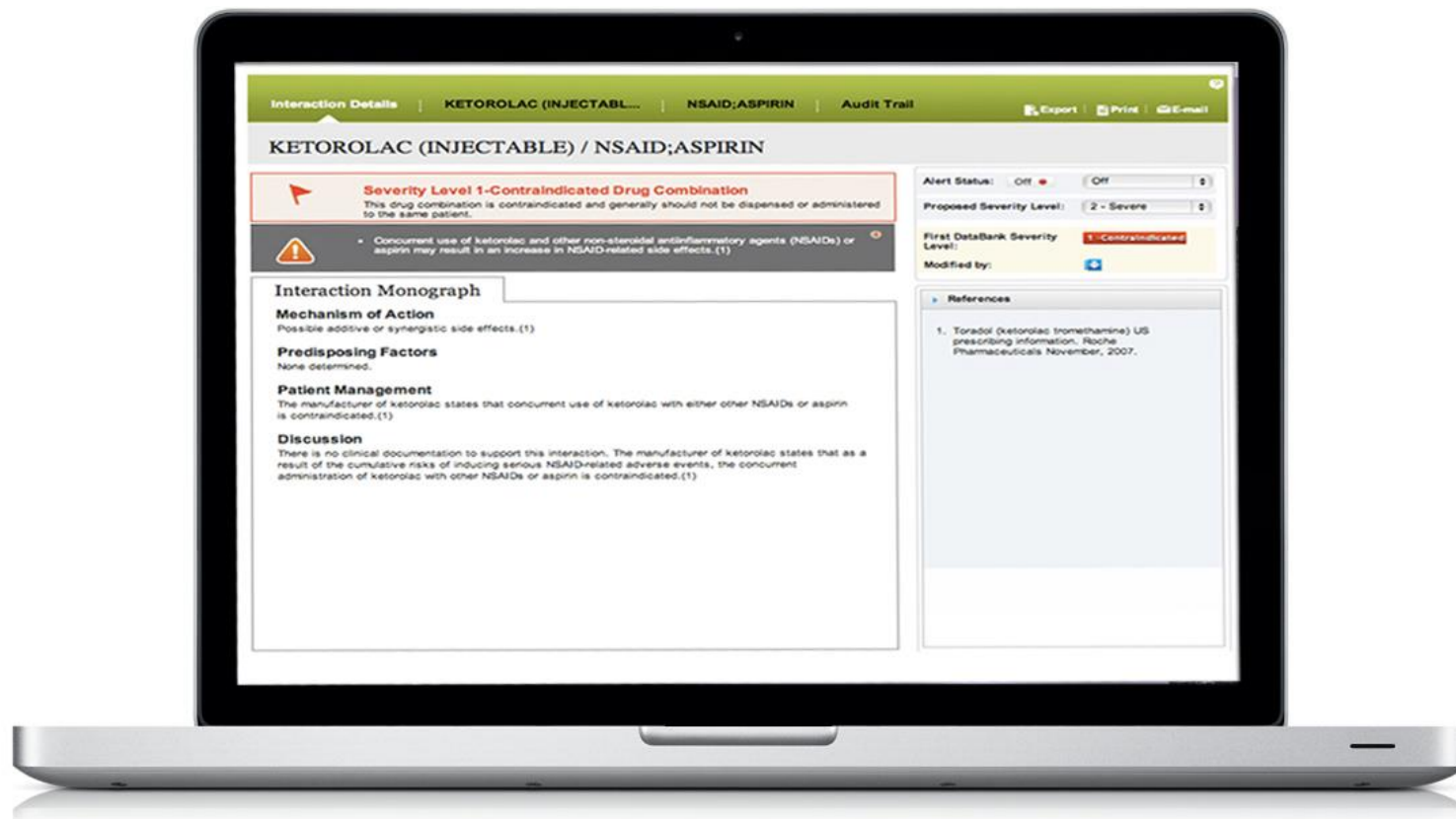
Innovation

FDB AlertSpace®: Local Customization Enhances Medication Alert Relevance

FDB AlertSpace

Easy, institution-specific modification of medication alerts

- Edit, track, and audit all customizations
- Benchmark against FDB updates
- Add to existing workflow without additional software or programming



Targeted Medication Warnings

Decrease Noise and Provide Actionable Guidance

By leveraging patient parameters

2 -Severe
POTASSIUM PREPS interacts with POTASSIUM SPARING DIURETICS

May observe hyperkalemia which may be severe or even fatal.

3 -Moderate
ACE INHIBITORS; ARBS; ALISKIREN interacts with POTASSIUM SPARING DIURETICS

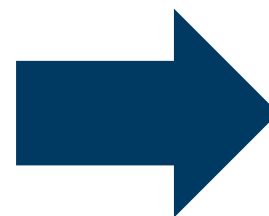
Concurrent use of potassium sparing diuretics with an ACE inhibitor, an ARB, or aliskiren may result in hyperkalemia.

lisinopril 20 mg tablet
spironolactone 25 mg

3 -Moderate
ACE INHIBITORS; ARBS; ALISKIREN interacts with POTASSIUM PREPARATIONS

Concurrent use of potassium supplements with ACE inhibitors, ARBs, or aliskiren may result in hyperkalemia.

lisinopril 20 mg tablet
potassium chloride ER 15 mEq tablet, extended release(part/cryst)



Patient has hyperkalemia and is on medications that can increase potassium.

Primary Medications that Cause Hyperkalemia	Effect of Primary Medication Intensified by
lisinopril oral	
potassium chloride oral	
spironolactone oral	naproxen sodium oral

[More Information](#)

Last K (collected 2 days ago) = 5.7 mmol/L
Previous K (collected 3 months ago) = 5.1 mmol/L

Remove the following orders?

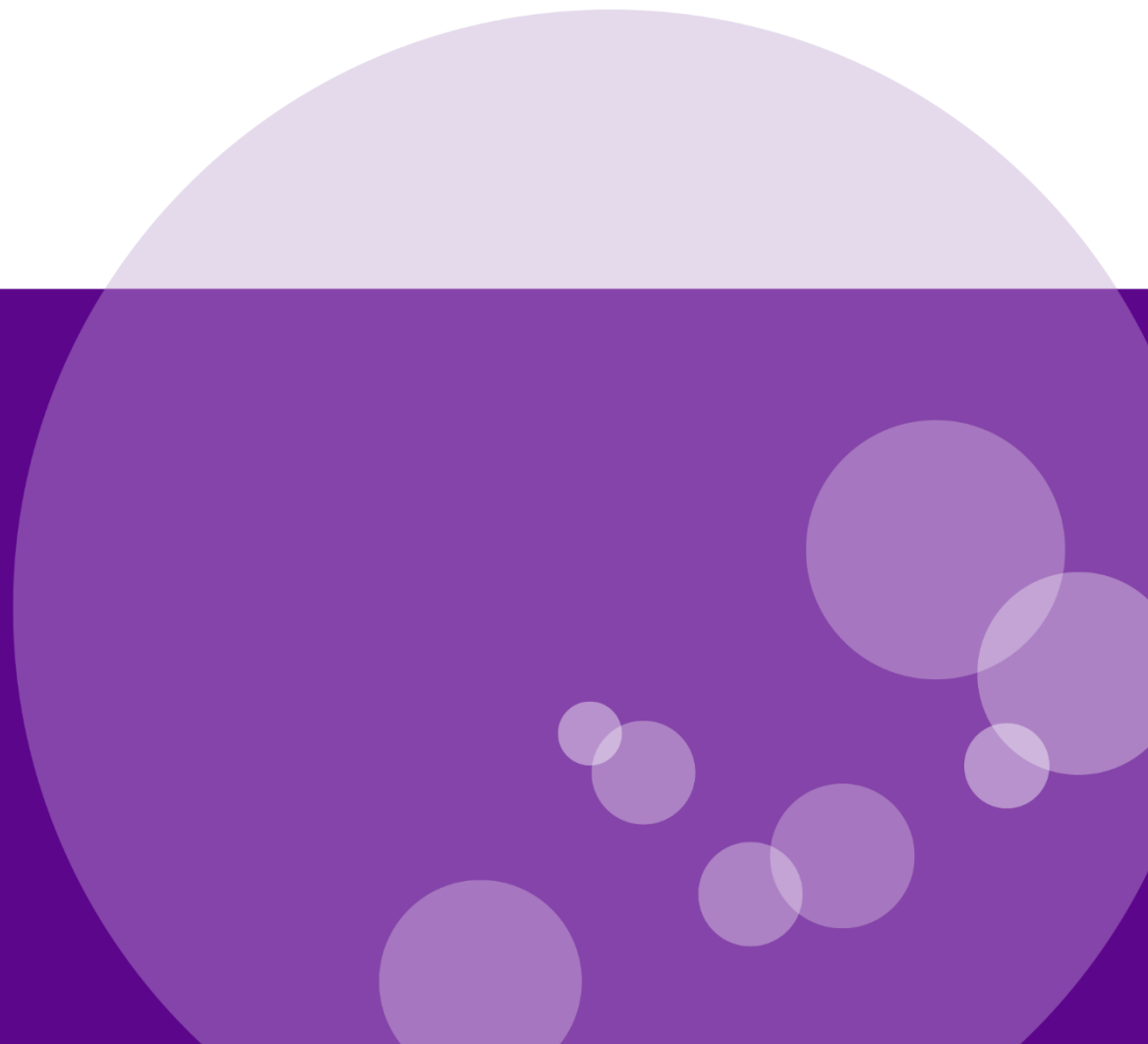
lisinopril 20 mg tablet, 1 tablet by mouth twice daily

Acknowledge Reason

- Over alerting
- Wrong time
- Limited Information

- Leverage patient's serum potassium lab results
- Only trigger actionable alerts for patients who manifest hyperkalemia

CDS Analytics



CDS Analytics

Evaluate CDS Efficacy

- Analyze local alerting patterns
 - Medication Alerts
 - Local/custom alerts
 - Targeted Medication Warnings
- Identify CDS malfunctions
- Understand alert burden
 - Provider
 - Specialty
 - Department
- Optimize existing alerts
 - Summary data
 - Specific alerts

