Improving Provider Decision-Making Tools

WORKSHOP on Strategies for Promoting the Safe Use and Appropriate Prescribing of Prescription Opioids

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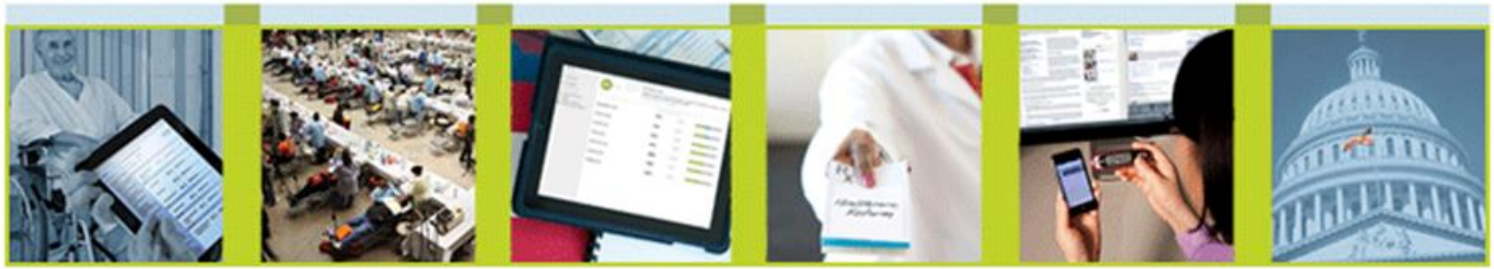

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Decision Making Tools

1. **CONTENT: Information being presented**
   - **facilitate the practice of evidence-based medicine**
   - **built on agnostic, standard data models**
   - **static vs. dynamic**
   - **amassment of expert knowledge**
   - **processing and computations that a human cannot do quickly**
   - **leads to unambiguous decision path**

2. **REAL-TIME ACCESS:**
   - **pluggable: easily integrate-able into existing workflows**
   - **take no more than *n min.* of patient encounter (unscheduled visit)**

1. **VALIDATION:**
   - **“how am I doing”: feedback loop**
   - **outcome evaluation: leverage several disparate data sources**
   - **adapt and retrain on new populations**

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LANDSCAPE STUDY:

Survey of Decision Making Tools for Opioid Prescribing

Two Studies - conducted in 2013 & 2018

- **92% prescribed opioid in past 90 days**
- **22% did not log into PDMP at all**
- **77% use an EHR system**
- **16% use a clinical decision making tool**
- **25% EHR integrated with state's PDMP**

Decision Making: NOW	Decision Making: WISH LIST
"traffic signal 'rules'"	"single sign-on to (all) PDMPs"
"Ottawa ankle rule, PERC rule"	"automatic best practice advisory in popup"
"personal experience; clinical judgement"	"differential diagnosis and data supporting decision"
"CDC guidelines"	"dosing, med selection, MME calculations"
"UDS drug screen"	"EMR link to decision rule with auto-data fill in"
"Wisconsin PDMP"	"clear, concise decision-making trees and bullet points"

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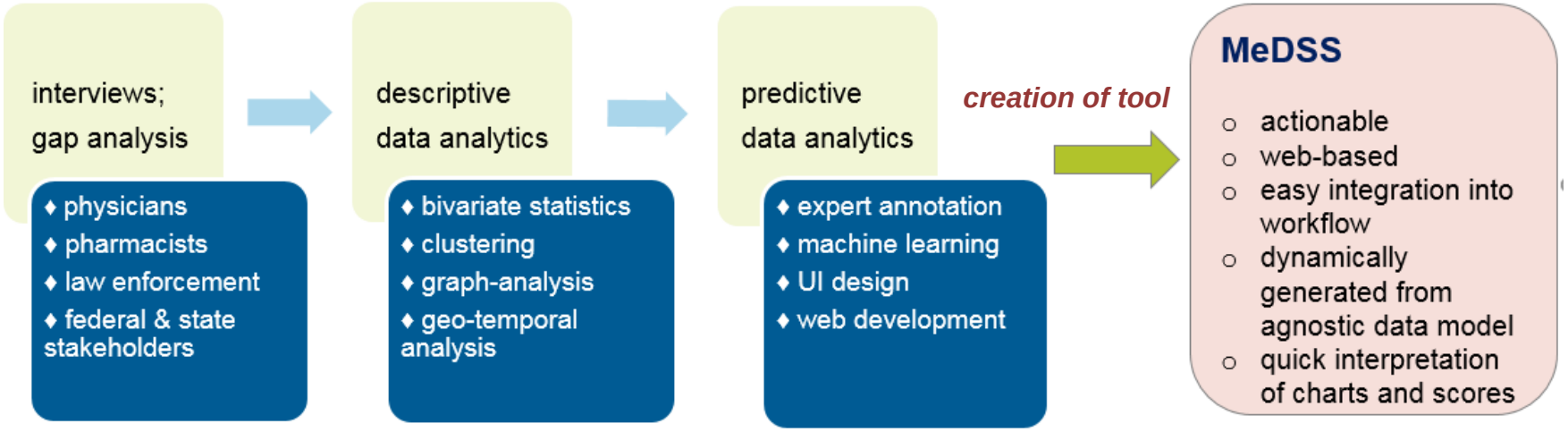
Creating a Decision-Making Tool: A Systematic Approach

MeDSS, Medication Decision Support Suite



2013 LANDSCAPE STUDY REPORT Key Findings (revised 2017)

- methods obfuscated (algorithms in black-box): static rules and bivariate statistics on raw attributes used synonymously with predictive analytics
- not integrated into existing workflows: hard to use at point of care
- SME annotation/ historical outcomes not fed back into data for modeling
- lack of usability/interpretability and pilot of outcomes in clinical setting

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MeDSS for Decision Making…

MeDSS provided dynamically- generated graphics on patient timeline, daily MME , other data modalities such as payment, all temporally aligned, and also patient risk assessment based on predictors from machine learning applied to very large longitudinal PDMP data.

From HIMSS 2016 conference Presentation with Dr. Scott Weiner, BWH, Boston

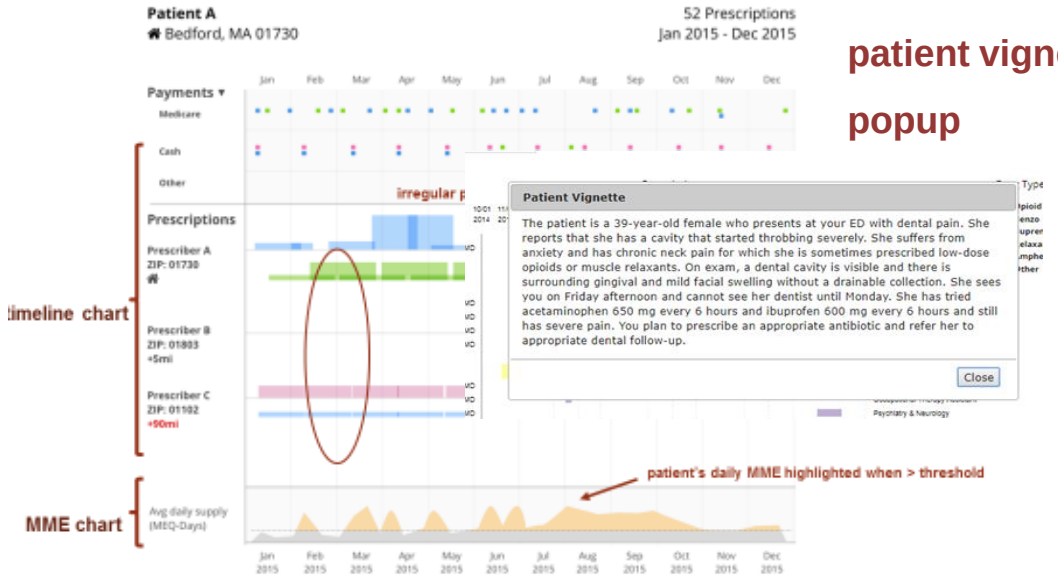
CONTROL Group View

# of prescriptions in 12 months	10	# of private pay in 12 months	
# of prescribers in 12 months	10	# of pharmacies in 12 months	

Prescriptions

Drug (Generic Name)	Drug (Trade Name)	Strength	Form	Fill Date	Quantity	Days Supply	Prescriber	Pharmacy	Private Pay
Acetaminophen/Oxycodone Hydrochloride	OXYCODONE AND ACETAMINOPHEN	325 MG-5 MG	Tablet	10/22/2014	15	3	THOMAS KINKADE	Cvs Pharmacy 717 36 White St Cambridge MA 02140	
Acetaminophen/Hydrocodone Bitartrate	HYDROCODONE BITARTRATE AND ACETAMIN	325 MG-5 MG	Tablet	09/19/2014	10	4	MARIA WELCH	Cvs Pharmacy 8319 One Davis Sq Somerville MA 02144	
Acetaminophen/Oxycodone Hydrochloride	APAP/OXYCODONE	325 MG-5 MG	Tablet	09/17/2014	10	2	MARCUS JOHANSEN	Cvs Pharmacy 2592 468 Blue Hill Ave Dorchester MA 02121	
Acetaminophen/Oxycodone Hydrochloride	OXYCODONE AND ACETAMINOPHEN	325 MG-5 MG	Tablet	08/20/2014	10	1	JULIUS HAPHNER	Walgreens #11797 465 Cambridge St Allston MA 02134	
Acetaminophen/Oxycodone Hydrochloride	APAP/OXYCODONE	325 MG-5 MG	Tablet	08/19/2014	5	2	ANTOINE MELVIN	Cvs Pharmacy 471 778 Dudley St Dorchester MA 02124	
Acetaminophen/Hydrocodone Bitartrate	HYDROCODONE BITARTRATE AND ACETAMIN	325 MG-5 MG	Tablet	08/12/2014	10	2	MASSACHUSETTS MEDICAL CENTER	Cvs Pharmacy 8319 One Davis Sq Somerville MA	
Acetaminophen/Oxycodone Hydrochloride	APAP/OXYCODONE	325 MG-5 MG	Tablet	07/11/2014	12	3	HARRISON KIRBY		
Acetaminophen/Oxycodone Hydrochloride	APAP/OXYCODONE	325 MG-5 MG	Tablet	07/08/2014	15	4	SHACHIN		
Oxycodone Hydrochloride	OXYCODONE HYDROCHLORIDE	5 MG	Tablet	05/29/2014	12	2	JA		
Acetaminophen/Oxycodone Hydrochloride	APAP/OXYCODONE	325 MG-5 MG	Tablet	05/22/2014	1				

TEST Group Dashboard



patient vignette popup

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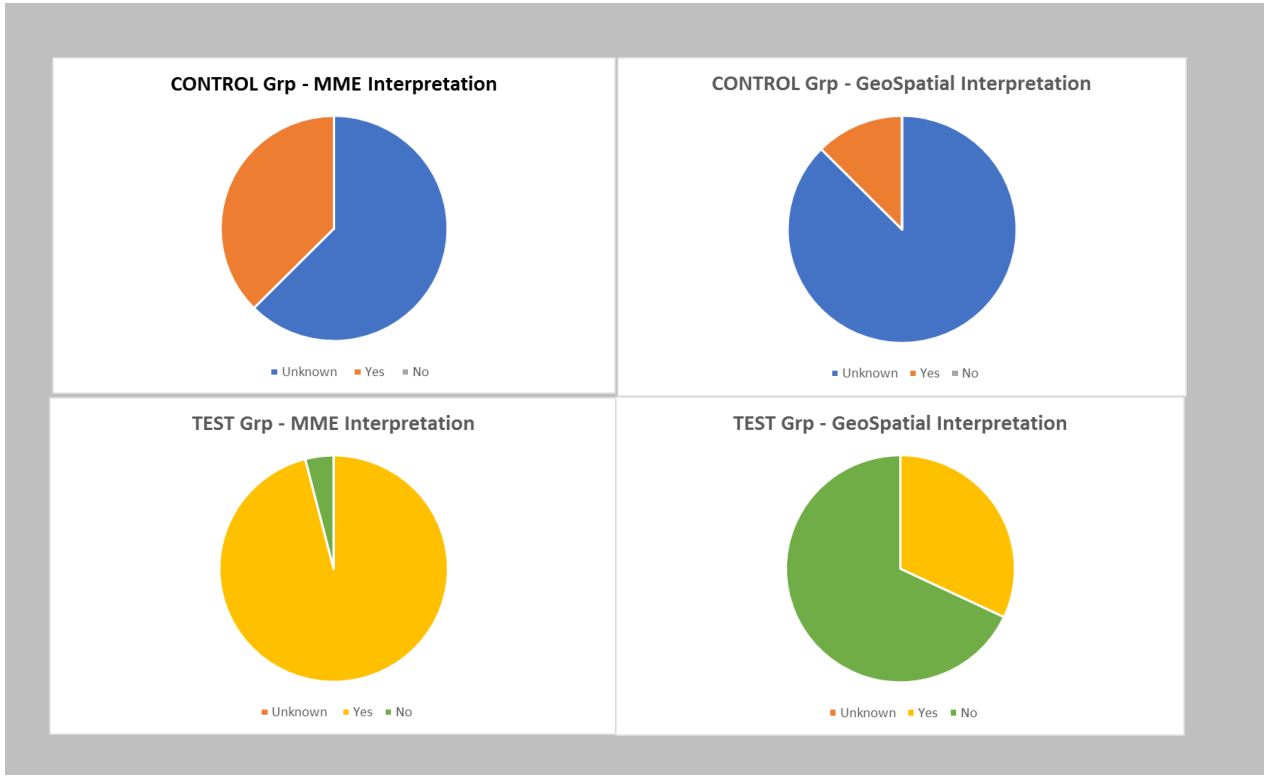
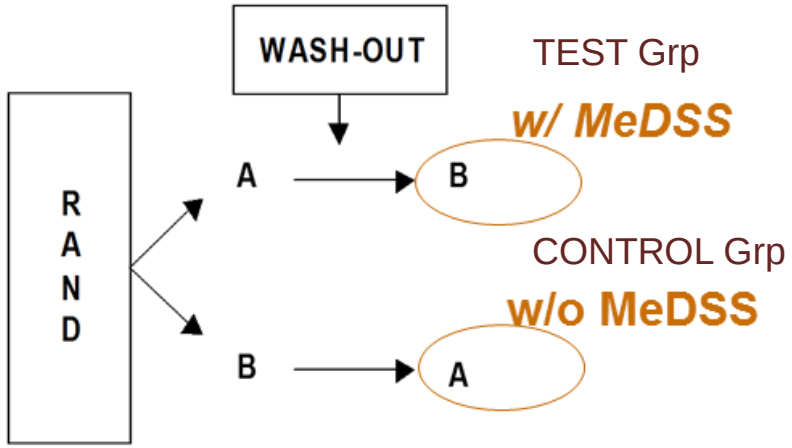
MeDSS for Decision Making… Results from Pilot

We collaborated with 2 Major Hospitals in Boston and Baltimore: 100 participating physicians in a cross-over study





STUDY: prescribing behavior

Note: Evaluation and publication of complete results co-authored with Dr. S. Weiner is expected in May, 2018

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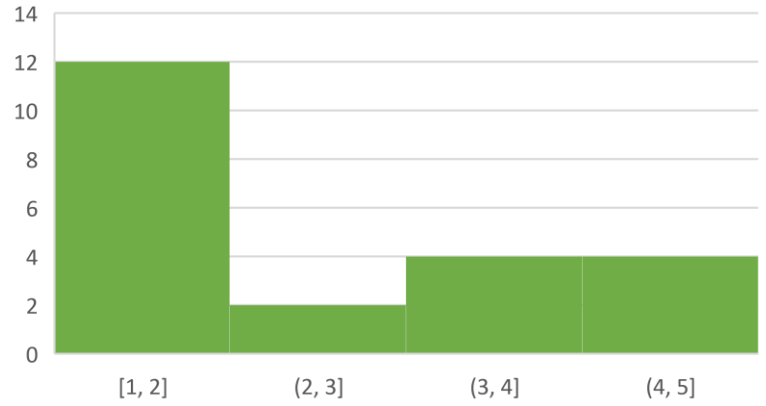
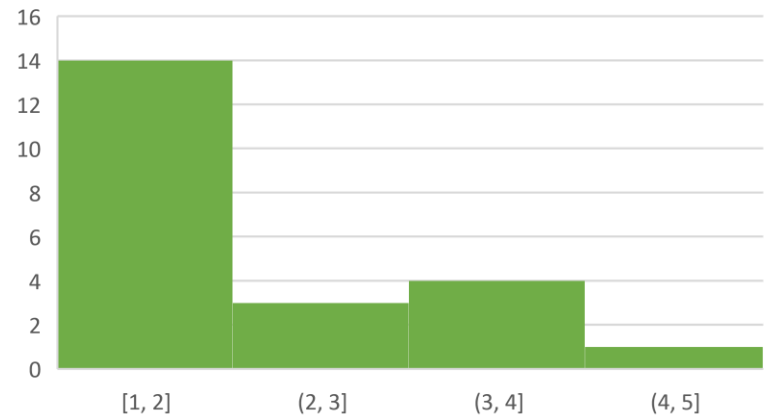
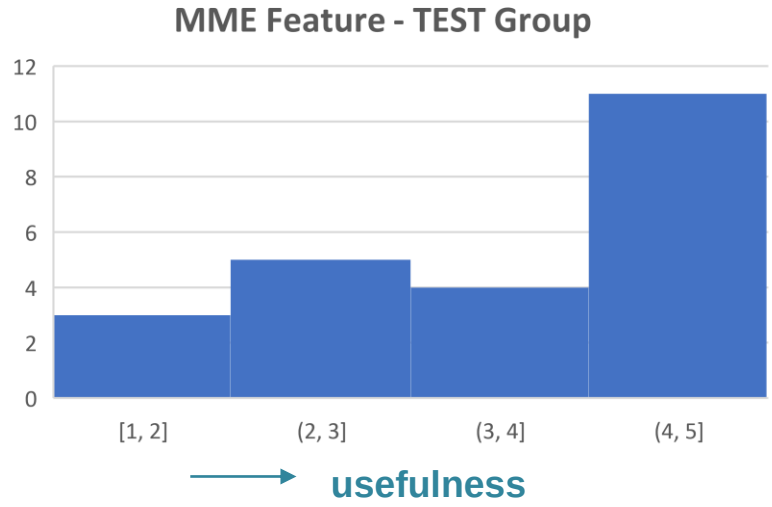
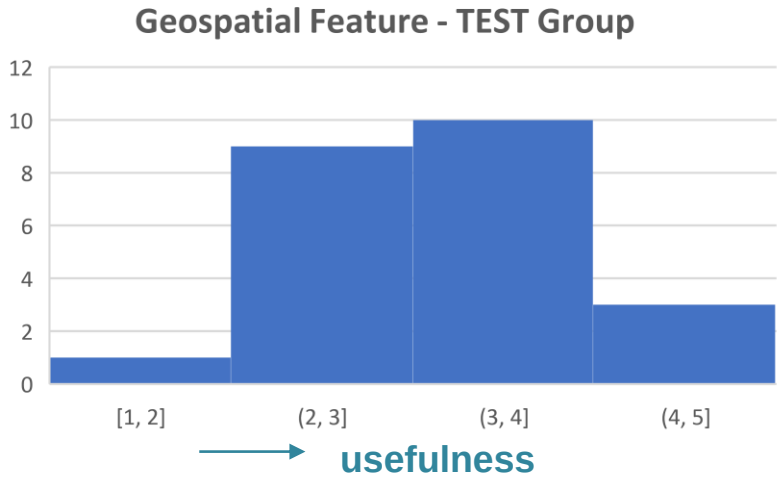
MeDSS Pilot Phase I Results: USEFULNESS SURVEY









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Challenges

PRESCRIBER RESPONSE

- **Do the tools reduce subjectivity?**
- **To what extent does prescribing behavior change when presented with information that involves complex computations and not just straight-up raw attributes?**

CHALLENGES/BARRIERS

- **Absence of standard PDMP data model - model transformation layer**
- **Lack of EHR-PDMP integration**
- **Legacy systems make transition slower: staging is piecemeal**
- **Hard to create dashboards without record linkages across disparate data sources**

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