

Clinical Decision Support for Population Health

Scott Weingarten, MD



CEDARS-SINAI

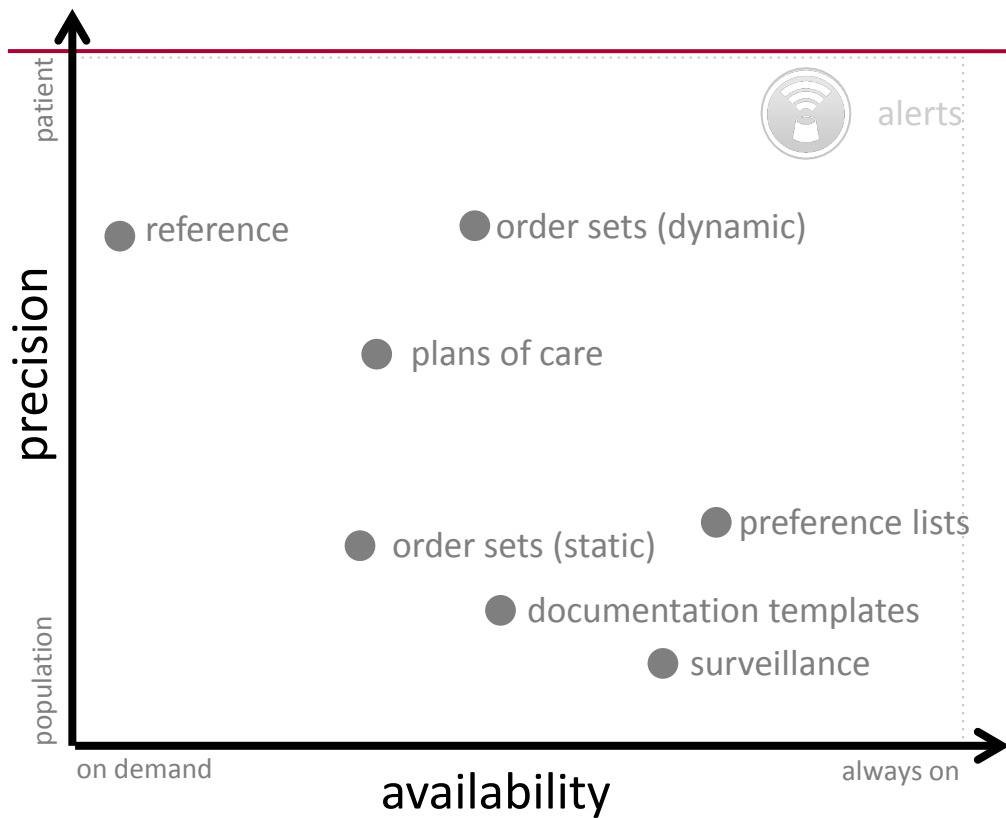
LEADING THE QUEST

cedars-sinai.edu

75% of decision support interventions succeed
-when the information **is provided to clinicians automatically**, whereas none succeed when clinicians are required to seek out the advice

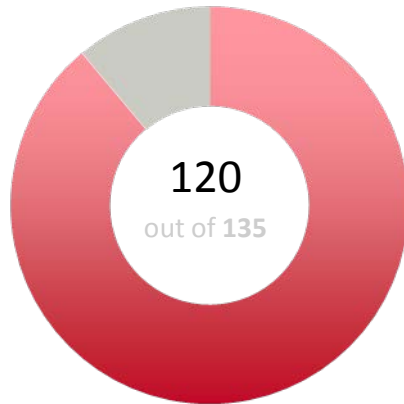
predictor of success	adjusted OR
automatic provision of decision support as part of workflow	112
provision of decision support at the time and location of decision making	15
provision of recommendation rather than just an assessment	7
computer-based generation of decision support	6

decision support is
most effective at the
point of care

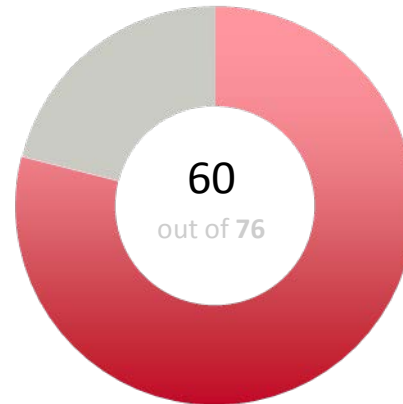


most appropriate CDS
for Choosing Wisely

existing recommendations
currently deployed



new recommendations
included in March 2014



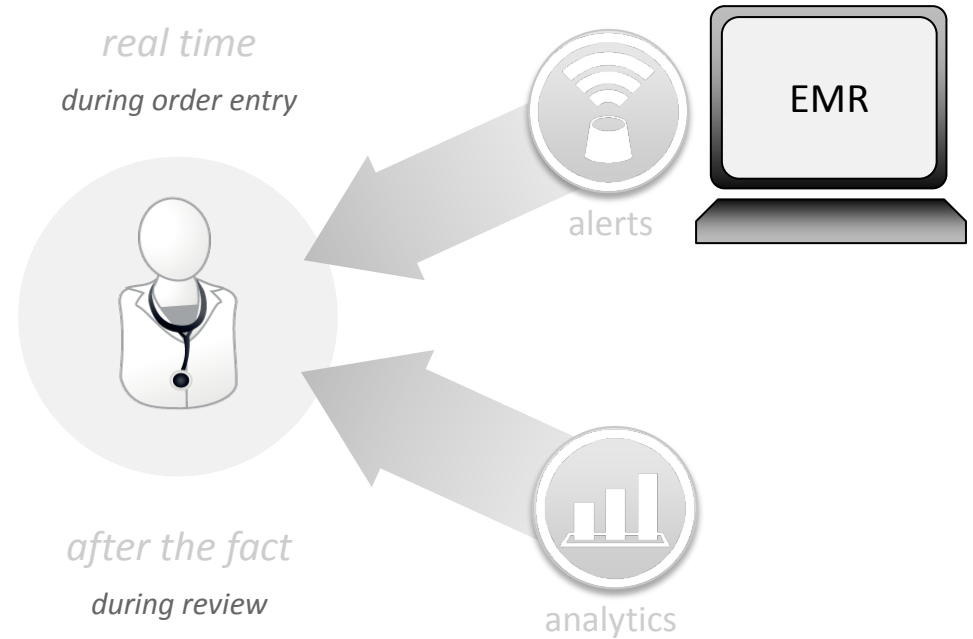
86%

*of all CW recommendations
will be covered **

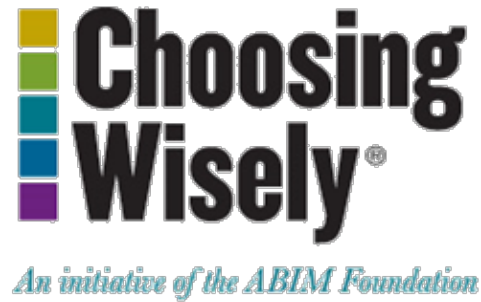
2 ways to impact physician decisions:

real time alerts

relevant analytics



260 recommendations
50 leading medical societies
representing > 500,000 physicians



potential harms

“don’t do” imaging studies for chronic isolated headache

Kaiser Permanente Woodland Hills

1990, **100,800** adults

15 to 27 month follow-up period

No CT scans for chronic isolated headache
yielded new and important information

CT brain radiation exposure may cause
4,000 additional cases of cancer per year in US

Model based on National Research Council’s “Biological Effects of Ionizing Radiation”

False positives, one led to unnecessary brain biopsy

Weingarten, et al. Archives of Internal Medicine 1992;152(12):2457-62

Arch Intern Med. 2009 Dec 14;169(22):2071-7



An initiative of the ABIM Foundation





Wisely (1 Advisory)

Antibiotics should not be used for apparent viral respiratory illnesses (sinusitis, pharyngitis, bronchitis). (American Academy of Pediatrics) **1,2**

Knowledge reason:

- Fever, symptoms >7 days, purulent nasal discharge, maxillary toothache, unilateral conjunctivitis
- Symptoms worsened after initial improvement
- Other (See Complications)

- Choosing Wisely: American Academy of Pediatrics
- For Patients: Antibiotics for Respiratory Illness
- For Patients: Antibiotics for Respiratory Illness (SPANISH)

Choosing Wisely

About Lists

American Academy of Pediatrics

American Academy of Pediatrics

Five Things Physicians and Patients Should Question

Download PDF

1 Antibiotics should not be used for apparent viral respiratory illnesses (sinusitis, pharyngitis, bronchitis).

Although overall antibiotic prescription rates for children have fallen, they still remain high and are linked to antibiotic resistance.

Targeted Test	Count	Targeted Test	Count
(amb) BENZODIAZAPINE	1334	(amb) CERVICAL CANCER SCREENING WOMEN OVER 65	25
(amb) A1C <7.5%	651	(inp) DVT WORKUP	16
(inp) STRESS ULCER PROPHYLAXIS MEDICATIONS FOR LOW RISK PATIENTS	563	(inp) LYME DISEASE	14
(amb) NSAIDS HYPERTENSION	440	(amb) ANTIBIOTICS FOR SINUSITIS	12
(amb) VITAMIN D DEFICIENCY	351	(amb) CEA FOR ASYMPTOMATIC CAROTID STENOSIS	7
(inp) NSAIDS HYPERTENSION	222	(amb) DEXA SCAN MALE	7
(amb) SPIROMETRY IN ASTHMA	221	(amb) CT SINUSITIS	6
(amb) RENAL ARTERY US	136	(amb) IR PICC	6
(amb) LYME DISEASE	120	(amb) ORAL ANTIBIOTICS FOR ACUTE OTITIS EXTERNA	6
(inp) BENZODIAZAPINE	116	(amb) PAP SMEAR UNDER 21	6
(inp) DAILY CBC	113	(amb) BONE SCAN BREAST	5
(amb) TESTOSTERONE	96	(amb) BONE SCAN PROSTATE	3
(amb) IMAGING FOR LOW BACK PAIN	68	(amb) CT ANGIO FOR PULMONARY EMBOLISM IN YOUNG WOMEN	2
(amb) CHEST X RAY PREOP OR ADMISSION	63	(amb) THYROID SCAN	2
(amb) HPV DNA	61	(amb) ANNUAL STRESS TESTING AFTER CORONARY REVASCULARIZATION	1
(inp) URINARY CATHETER	51	(amb) CAROTID IMAGING FOR SYNCOPE	1
(amb) CAROTID ARTERY STENOSIS SCREENING	50	(amb) CHRONIC URTICARIA	1
(amb) PAP SMEAR AGES 30-65	50	(amb) ECHOCARDIOGRAMS FOR PRE-OP	1
(inp) BRAIN IMAGING FOR SYNCOPE	41	(amb) IMAGING FOR HOARSENESS	1
(inp) ANTIPSYCHOTICS DEMENTIA	40	(amb) STEROIDS FOR INFANTS	1
(inp) CAROTID IMAGING FOR SYNCOPE	35	(inp) BRONCHODILATOR INFANT	1
(amb) BRAIN IMAGING FOR UNCOMPLICATED HEADACHE	34	(inp) ICD AND DYING PATIENT PROTOCOL	1
(amb) ANTIPSYCHOTICS DEMENTIA	29	(inp) PEG TUBE DEMENTIA	1
(amb) DEXA SCAN FEMALE	27		

alert
fatigue?

many discussions with
physicians

≈ alerts 100 per day

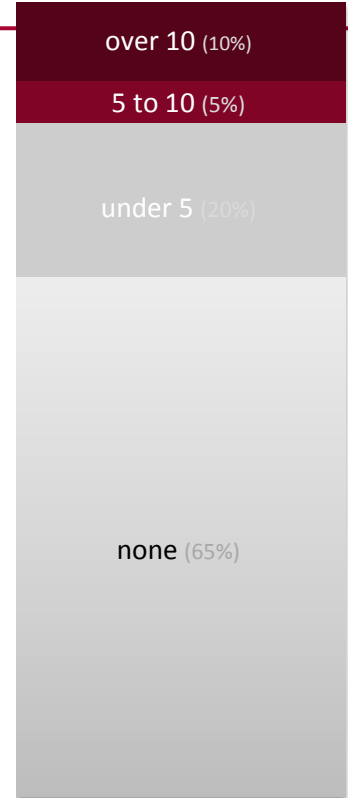
no significant complaints (yet)



alert fatigue?

most physicians are
not seeing any alerts
at all

no significant
complaints (yet)



number of alerts seen by physician

2

Don't use antipsychotics as first choice to treat behavioral and psychological symptoms of dementia.

People with dementia often exhibit aggression, resistance to care and other challenging or disruptive behaviors. In such instances, antipsychotic medicines are often prescribed, but they provide limited benefit and can cause serious harm, including stroke and premature death. Use of these drugs should be limited to cases where non-pharmacologic measures have failed and patients pose an imminent threat to themselves or others. Identifying and addressing causes of behavior change can make drug treatment unnecessary.

4

Don't use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation or delirium.

Large scale studies consistently show that the risk of motor vehicle accidents, falls and hip fractures leading to hospitalization and death can more than double in older adults taking benzodiazepines and other sedative-hypnotics. Older patients, their caregivers and their providers should recognize these potential harms when considering treatment strategies for insomnia, agitation or delirium. Use of benzodiazepines should be reserved for alcohol withdrawal symptoms/delirium tremens or severe generalized anxiety disorder unresponsive to other therapies.

3

Don't use opioid or butalbital treatment for migraine except as a last resort.

Opioid and butalbital treatment for migraine should be avoided because more effective, migraine-specific treatments are available. Frequent use of opioid and butalbital treatment can worsen headaches. Opioids should be reserved for those with medical conditions precluding the use of migraine-specific treatments or for those who fail these treatments.

1

Don't perform population based screening for 25-OH-Vitamin D deficiency.

Vitamin D deficiency is common in many populations, particularly in patients at higher latitudes, during winter months and in those with limited sun exposure. Over the counter Vitamin D supplements and increased summer sun exposure are sufficient for most otherwise healthy patients. Laboratory testing is appropriate in higher risk patients when results will be used to institute more aggressive therapy (e.g., osteoporosis, chronic kidney disease, malabsorption, some infections, obese individuals).

Impact Analysis

	Pre Intervention Jan 1 – Sep 9	Post Intervention Sep 10 – Nov 25		
	mean orders	mean orders	% change	p-value
Antipsychotics Patients ≥ 70	203	166	-18.2%	<0.001
Benzo-Sedatives Patients ≥ 65	133	116	-12.5%	<0.001
Butalbital Adults	4.13	3.58	-13.3%	<0.04
Vitamin-D levels	322	286	-13.7%	<0.001

Rates per 10,000 encounters



Physician 1

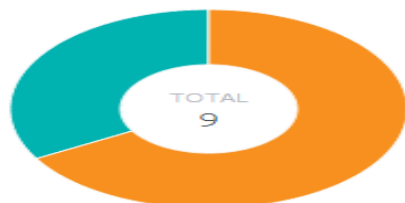


alerts



■ LYME DISEASE

seen by



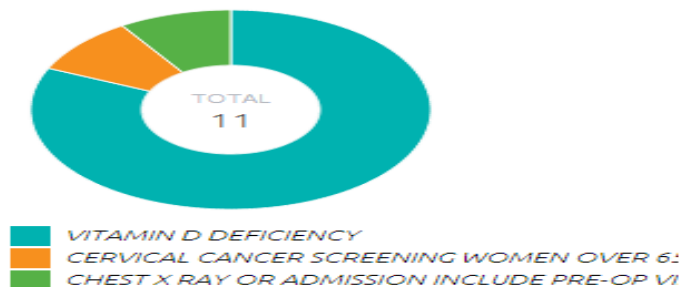
■ provider
■ someone else

alert details

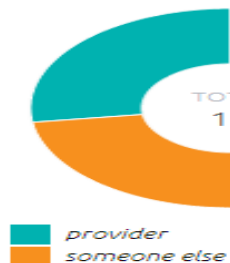
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Lyme Disease [104947652]	Jan 23, 2014 4:00 PM
Lyme Disease [104947728]	Jan 23, 2014 4:00 PM
Lyme Disease [104737152]	Jan 22, 2014 4:00 PM
Lyme Disease [104605027]	Jan 21, 2014 4:00 PM
Lyme Disease [104605777]	Jan 21, 2014 4:00 PM

Physician 2

alerts



seen by

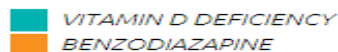
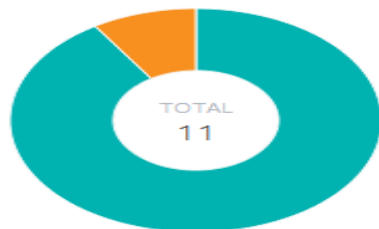


alert details

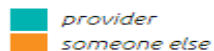
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Vitamin D Deficiency [105025378]	Jan 23, 2014 4:00 PM
Vitamin D Deficiency [104984950]	Jan 23, 2014 4:00 PM
Cervical Cancer Screening Women Over 65 [105011377]	Jan 23, 2014 4:00 PM
Vitamin D Deficiency [104993687]	Jan 23, 2014 4:00 PM
Vitamin D Deficiency [104745041]	Jan 22, 2014 4:00 PM
Vitamin D Deficiency [104805535]	Jan 22, 2014 4:00 PM
Vitamin D Deficiency [104821269]	Jan 22, 2014 4:00 PM
Chest X Ray Or Admission Include Pre-op Visit Types	Jan 20, 2014 4:00 PM

Physician 3

alerts



seen by



alert details

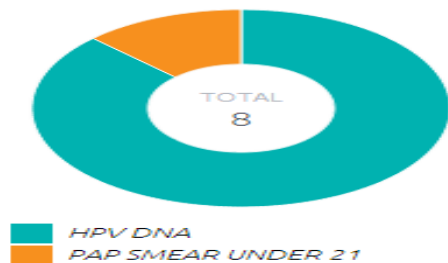
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Vitamin D Deficiency [104980789]	Jan 23, 2014 4:00 PM	Demo60, Diana Medical Assistant
Vitamin D Deficiency [104972808]	Jan 23, 2014 4:00 PM	Demo4, Karla H Medical Assistant
Vitamin D Deficiency [104757301]	Jan 22, 2014 4:00 PM	Demo60, Diana Medical Assistant
Vitamin D Deficiency [104754422]	Jan 22, 2014 4:00 PM	Demo4, Karla H Medical Assistant
Benzodiazapine [104556015]	Jan 21, 2014 4:00 PM	Demo60, Diana Medical Assistant
Vitamin D Deficiency [104313632]	Jan 20, 2014 4:00 PM	Demo60, Diana Medical Assistant
Vitamin D Deficiency [104304225]	Jan 20, 2014 4:00 PM	Demo60, Diana Medical Assistant
Vitamin D Deficiency [104323081]	Jan 20, 2014 4:00 PM	Demo4, Karla H Medical Assistant

Physician 4

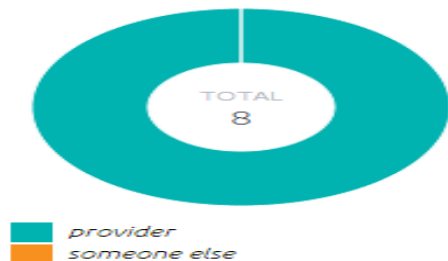
★★★★☆ (36)
compliance

★★★★☆ (39)
performance

alerts



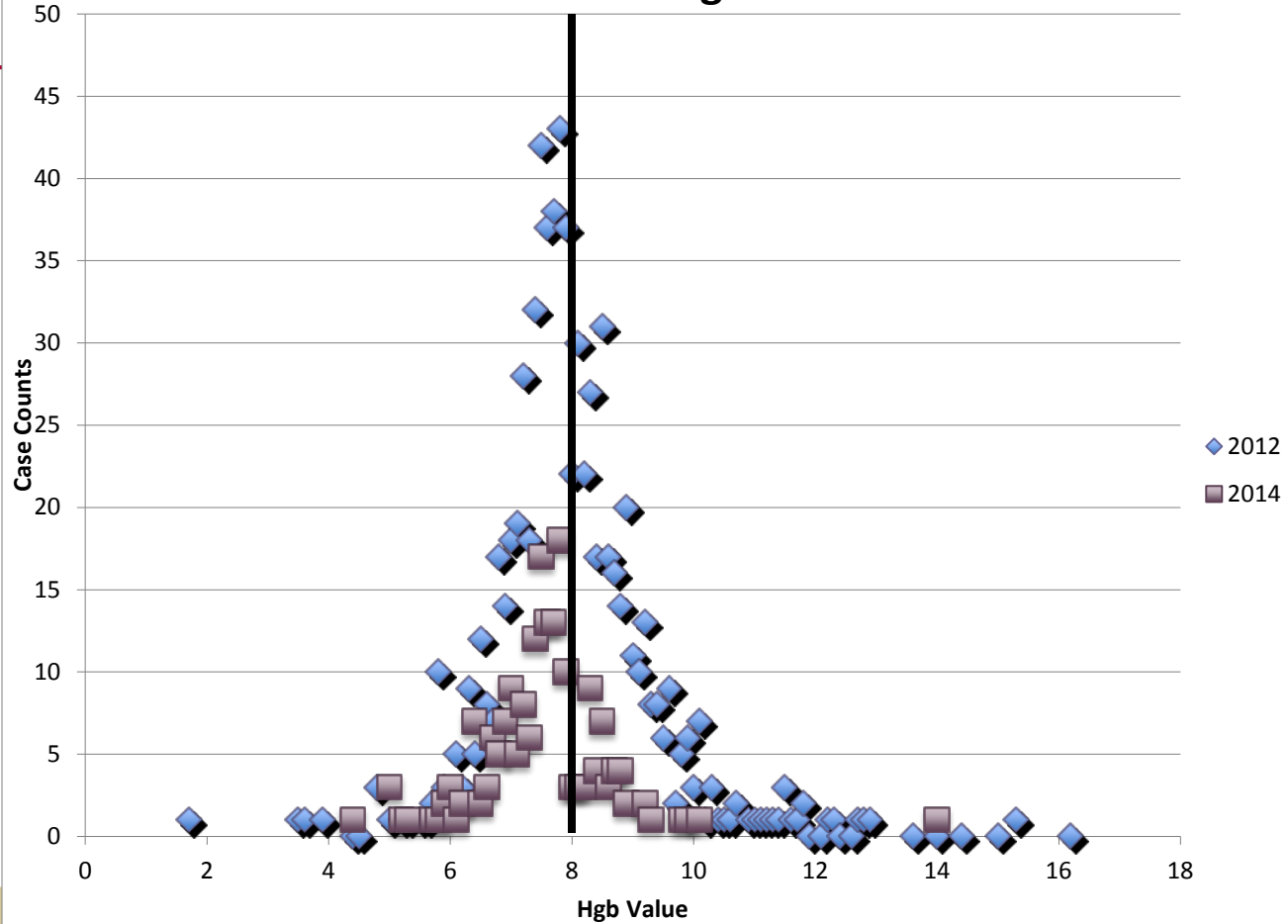
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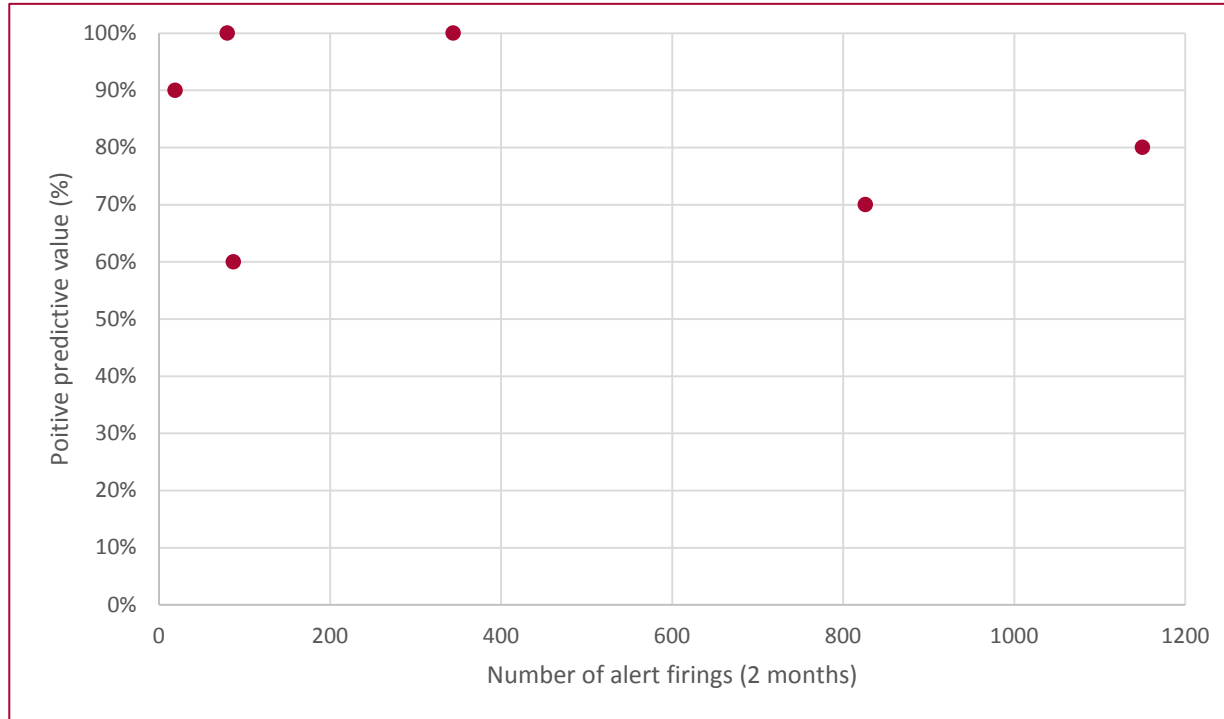
alert details

alert name	alert date
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Hpv Dna [105013944]	Jan 23, 2014 4:00 PM
Pap Smear Under 21 [105013943]	Jan 23, 2014 4:00 PM
Hpv Dna [104591313]	Jan 21, 2014 4:00 PM
Hpv Dna [104554970]	Jan 21, 2014 4:00 PM
Hpv Dna [104530855]	Jan 21, 2014 4:00 PM
Hpv Dna [104319075]	Jan 20, 2014 4:00 PM
Hpv Dna [104300512]	Jan 20, 2014 4:00 PM

Pre-transfusion Hemoglobin 2012-2014



Positive predictive value and alert firing frequency



Deep Dive

- Increased risk of falls (57% for benzos, 97% for Valium)
- Increased risk of MVAs
- Increased risk of hip fractures

4

Don't use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation or delirium.

Large scale studies consistently show that the risk of motor vehicle accidents, falls and hip fractures leading to hospitalization and death can more than double in older adults taking benzodiazepines and other sedative-hypnotics. Older patients, their caregivers and their providers should recognize these potential harms when considering treatment strategies for insomnia, agitation or delirium. Use of benzodiazepines should be reserved for alcohol withdrawal symptoms/delirium tremens or severe generalized anxiety disorder unresponsive to other therapies.

Arch Intern Med. 2009;169(21):1952-1960
J Am Geriatr Soc 59:1883–1890, 2011.

Impact of Blind Spot Monitor Prescriptions of Benzodiazepines to Elderly Patients

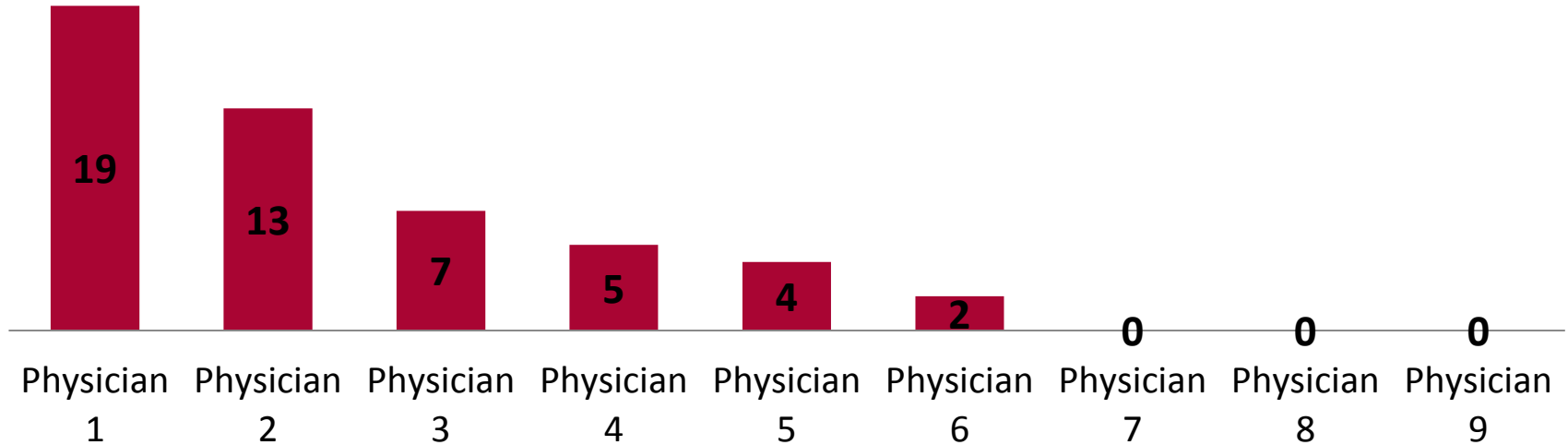
Change in number of prescriptions from baseline with active alert*

	Age \geq 65 years	Age <65 years
Pilot MD offices	-20.9%	3.6%
Control MD offices	10.6%	3.5%
Difference	-31.5%	+0.01%

*Comparison periods 7/13/13 to 8/6/13 and 8/7/13 to 8/31/13

Over-riding the Blind Spot Monitor

Benzodiazepine Over-rides By Physician Patients >65 Years – Early Data



31.5%
reduction in
benzodiazepine use



projected reductions
over 1 year

22

fall related injuries

6

ED visits

3

hospitalizations

2

deaths from falls

potential
impact

*Woolcott et al. JAGS 2009,
CDC. MMWR Weekly 2008,
Schiller et al., Adv Data No. 392 (CDC) 2007,
Pariente et al, Drugs Aging 2008*



“It is not the strongest of the species that survives, nor the most intelligent that survives, it is the one that is most adaptable to change.”



It is not the strongest of *health systems* that survive, nor the most intelligent that survives, it is the one that is most adaptable to change.



“Every morning a lion wakes up.

It knows that it must outrun the slowest gazelle
or it will starve to death.”

“Every morning in Africa, a gazelle wakes up.

It knows that it must run faster than the fastest lion
or it will be killed.”