C24: Clinical and Cost Improvement for Population Health

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Cedars-Sinai Health System

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Orlando, FL

This presenter has nothing to disclose.

Session Objectives

After this presentation, participants will be able to:

• Describe results from multiple organizations where information technology, clinical decision support, and data have been used to measurably improve quality and cost of care for populations of patients

• Discuss how these initiatives enable organizations to succeed in a health care environment that will transition toward risk-based payments
Appropriateness of Care

- Examples
  - Admissions
  - Length of stay
  - Diagnostic tests
  - Treatments
  - Procedures

Focus on Hospitalizations

- Admissions
- Length of stay
- Improved care in patient’s homes and physician offices
Population Health Patients

- Each admission reviewed by 2 to 3 physicians
- Was there a missed opportunity in the physician office or patient’s home?
  - Patient at high risk?
  - Fall risk assessment?
  - Home visit?

Health Plans

- Continued participation in commercial HMO
- Medicare Advantage
- Dual eligible contracts
- Exchange contracts

Number of Narrow Networks to increase in 2015
Medical/Surgery Patients at CSMC

- "Physician Advocates" – 1/2014
- Participate in daily Progression of Care Rounds
- Review Medical Records
- Identify opportunities to improve quality, efficiency
- Contact physician, "Can I help you...."
- Medical Staff reaction

Decision Support

Lowered accident claims
- Mercedes 16%
- Acura 15%
Options

**Education**

*Education alone does not work*

*People can remember 200 MB*

*Can a physician remember 400 different Choosing Wisely guidelines?*

*Education alone for Choosing Wisely did not work (1)*

**Recommendation**

*Transition to “clinical decision support in electronic medical records” and “clinician scorecards” (1)*

(1) Early Trends Among Seven Recommendations From the Choosing Wisely Campaign JAMA Intern Med 10/12/15

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**Physician-Led and Vetted Content**

*~400 interventions from 70 medical societies*

*Not from government or an insurance company*

**Inpatient**

*Reduce Medicare losses*

**Ambulatory**

*Prepare for risk-based payment*
Approach

- Governance
- Education
- Clinical decision support
- Monthly individual physician Choosing Wisely adherence feedback

Approach

- CDS lowers waste & cost
  - Nuclear imaging: 21%
  - CT & MRI imaging: 46%
  - High cost procedures: 14%
  - High cost labs: 6%
  - High cost meds: 13%
Choosing Wisely®: “Don't perform population based screening for 25-OH-Vitamin D deficiency”

clinical logic
inclusion criterion
Vitamin D test ordered
exclusion criteria
malignant lymphomas, diabetes, osteomalacia, vitamin D deficiency, chronic kidney disease, intestinal malabsorption, cirrhosis, chronic obstructive pulmonary disease, inflammatory bowel disease, radiation enteritis, unspecified non-infectious colitis, bariatric surgery, hyperparathyroidism, chronic pancreatitis, COPD, obesity, BMI > 30, sarcoidosis, tuberculosis, histoplasmosis, coccidioidomycosis, other fungal infections, berylliosis, malignant lymphosarcomas, other malignant lymphomes, diabetes, history of falls
Visit related to pregnancy
Active anti-seizure, antifungal, antiretroviral medications, glucocorticoids, or bile acid sequestrants

translation
IF Lab test order = LAB535
NOT (gender = female AND age >= 70 years) OR (gender = male AND age >= 65 years)
FROM ICD-10 OR ICD-10 diagnosis codes
THEN 25-OH-Vitamin D deficiency
Breakdown of alerts with PPV >=60% by type

Avoid Alert Fatigue – Reduce “False Positives”

Relationship of PPV versus number of alerts triggered

Breakdown of alerts with PPV >=60% by type
Choosing Wisely: Don’t use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation or delirium. (American Geriatrics Society) 1, 2, 3

Reasons for override:
- sleep disorder
- end of life care
- withdrawal / DT
- non-drug options failed
- peri-procedural anesthesia

no significant complaints (yet)
Inpatient alerts acceptance rates

- Low risk imaging for PE: 8%
- Brain imaging for syncope: 9%
- Echo after valve replacement: 9%
- Vitamin D deficiency testing: 10%
- Antipsychotics in dementia: 10%
- GCSF: 13%
- Benzodiazepines / SH in elderly: 15%
- DVT workup: 16%
- NSAIDS in hypertension: 23%
- Lyme disease testing: 24%
- Carotid imaging for syncope: 27%

High cost imaging and high risk medications in inpatient care:

- Benzodiazepines in elderly
- VQ scans and CT angiography
- Carotid artery ultrasound
- Brain CT
- Triliodothyronine (T3) tests
- Vitamin D deficiency screening

Imaging studies in ambulatory care:

- Carotid artery ultrasound
- Brain CT

Labs in ambulatory care:

- Triliodothyronine (T3) tests
- Vitamin D deficiency screening

Data for November 1, 2013 to January 26, 2014
### Change in Alert Volume

<table>
<thead>
<tr>
<th>Condition</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAIDS hypertension (amb)</td>
<td>-31%</td>
</tr>
<tr>
<td>CT brain- uncomplicated...</td>
<td>-36%</td>
</tr>
<tr>
<td>Benzodiazepine (amb)</td>
<td>-38%</td>
</tr>
<tr>
<td>Imaging for low back pain...</td>
<td>-39%</td>
</tr>
<tr>
<td>Imaging for pulmonary...</td>
<td>-39%</td>
</tr>
<tr>
<td>NSAIDS hypertension (inp)</td>
<td>-43%</td>
</tr>
<tr>
<td>Antipsychotics dementia (inp)</td>
<td>-45%</td>
</tr>
<tr>
<td>Lyme disease (amb)</td>
<td>-54%</td>
</tr>
<tr>
<td>Vitamin D deficiency (inp)</td>
<td>-56%</td>
</tr>
<tr>
<td>Chest x-ray Pre-op or...</td>
<td>-61%</td>
</tr>
<tr>
<td>HPV DNA testing (amb)</td>
<td>-65%</td>
</tr>
</tbody>
</table>

**Transitioning to “medium stops” increases CDS impact**

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### Projected Reductions Over 1 Year

- **31.5%** reduction in benzodiazepine use

<table>
<thead>
<tr>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 fall-related injuries</td>
</tr>
<tr>
<td>9 ED visits</td>
</tr>
<tr>
<td>8 &gt;6 months assistance</td>
</tr>
<tr>
<td>3 hospitalizations</td>
</tr>
<tr>
<td>2 deaths from falls</td>
</tr>
</tbody>
</table>

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References:

- Woolcott et al, JAGS 2009
- CDC, MMWR Weekly 2008
- Pariente et al, Drugs Aging 2008
targeted alerts integrated into workflow with closed loop analytics

C Crimson reports 17% reduction in blood utilization while CMI increased by 14%

* 2015 is projected from 6 months of data
** 2015 Case Mix Index (CMI) value is from January-June data
Overuse Dashboard

Physician - Reproductive Endocrinology

<table>
<thead>
<tr>
<th></th>
<th>last 7 days</th>
<th>last 30 days</th>
<th>03.01.2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.516 alerts/day</td>
<td>16 total alerts</td>
<td>529 total orders</td>
<td>0.03 alerts/order</td>
</tr>
</tbody>
</table>

Alert summary

<table>
<thead>
<tr>
<th>Alert</th>
<th>triggered</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>LYME DISEASE</td>
<td>6</td>
<td>100%</td>
</tr>
</tbody>
</table>

inappropriate ordering of Lyme disease tests
Overuse Dashboard

Physician - Internal Medicine

### Alert Summary

<table>
<thead>
<tr>
<th>Alert</th>
<th>Triggered</th>
<th>% of Total</th>
<th>Seen by Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzodiazepine</td>
<td>11</td>
<td>11 out of 118</td>
<td>not available</td>
</tr>
<tr>
<td>Vitamin D Deficiency</td>
<td>2</td>
<td>2 out of 91</td>
<td>not available</td>
</tr>
<tr>
<td>Chest X Ray Prep or Admis</td>
<td>2</td>
<td>2 out of 13</td>
<td>not available</td>
</tr>
</tbody>
</table>

*inappropriate ordering of benzodiazepines*

Overuse Dashboard

Physician - Internal Medicine

### Alert Summary

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<th>Triggered</th>
<th>% of Total</th>
<th>Seen by Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin D Deficiency</td>
<td>34</td>
<td>34 out of 168</td>
<td>not available</td>
</tr>
</tbody>
</table>

*inappropriate vitamin-D screenings - before January 2014*

### Alert Summary

<table>
<thead>
<tr>
<th>Alert</th>
<th>Triggered</th>
<th>% of Total</th>
<th>Seen by Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin D Deficiency</td>
<td>1</td>
<td>1 out of 168</td>
<td>not available</td>
</tr>
</tbody>
</table>

*inappropriate vitamin-D screenings - after May 2014*
What About Patients?

savings estimates (interim results)
Q3 2013 – Q1 2015

<table>
<thead>
<tr>
<th></th>
<th># CDS alerts</th>
<th>annual savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>inpatient</td>
<td>41</td>
<td>$2,115,928</td>
</tr>
<tr>
<td>ambulatory</td>
<td>102</td>
<td>$4,307,433</td>
</tr>
<tr>
<td>total</td>
<td>143</td>
<td><strong>$6,423,361</strong></td>
</tr>
</tbody>
</table>

assumes perspective of 100% at-risk contract and uses national Medicare reimbursement rates for cost estimates
### Choosing Wisely Interventions

<table>
<thead>
<tr>
<th>Health System A</th>
<th>Urban/suburban health system in the Midwest</th>
<th>5 hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,058,000 - $2,116,000 direct impact</td>
<td>(provider cancels order after seeing alert)</td>
<td></td>
</tr>
<tr>
<td>~$3,040,000 indirect impact</td>
<td>(educational effect – changed behavior)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health System B</th>
<th>Regional health system in the Southwest</th>
<th>6 hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,016,000 - $2,030,000 direct impact</td>
<td>(provider cancels order after seeing alert)</td>
<td></td>
</tr>
<tr>
<td>~$2,920,000 indirect impact</td>
<td>(educational effect – changed behavior)</td>
<td></td>
</tr>
</tbody>
</table>

### Changing the Model - Identifying Our Subspecialty Network

Selecting subspecialists for PCP referral risk-based contracts

Need to identify subspecialists who are high quality, high satisfaction, cost-effective
Measuring Risk-based Contract “Readiness”

Choosing Wisely adherence
30-day readmissions
Adherence to QI interventions
EHR best practice alert adherence
PCP perception surveys
Length of stay index
Severity-adjusted cost of care
Generic drug utilization

Data-Driven Pop-Health “Score”

Quartile 1  Quartile 2  Quartile 3  Quartile 4

Population Health “Readiness” Quartiles

Overuse Dashboard

Physician Choosing Wisely performance

• Average 0.74% ignored Choosing Wisely alerts
• Range 0% to 8.77% ignored

Dr. Jones
Example: 0.98%
Choosing Wisely Performance Rate, FY2015
Cardiology Results

final pop health readiness score

indicates lowest tercile of combined quant and qual data availability.

Reduce Inappropriate Utilization, Leverage the EHR

Sustainable and scalable approach, “hard wire” CDS into the EHR

>2 years “live” at Cedars-Sinai

CDS accepted by physicians, no evidence “alert fatigue”

Reduced costs

Improved quality

Associated with significant improvement in results, along with other improvement strategies
"Of course it's hard. It's supposed to be hard. If it were easy, everybody would do it. Hard is what makes it great."