NAPCRG PBRN Meeting: 
July 1, 2014

AHRQ: 1R18HS022701
Principal Investigator: Steven Ornstein
Co-investigators: Andrea Wessell, Ruth Jenkins, Cara Litvin, Lynne Nemeth, Paul Nietert,
9-1-2013 to 5-31-2014
• Use of certified EHR technology to submit CQM data is 1 of 3 major components of HITECH MU
• The ultimate goal of HITECH is to significantly improve care through MU of EHRs
• Submission of CQM data will not improve care
• Information is needed on how PCPs can “meaningfully use” EHRs to improve care—no large studies in primary care practice
Exemplar:

• Admired person or thing considered an example that deserves to be copied

MU Exemplar:

• A PPRNet PCP that has certified for Stage 1 MU and achieved high performance on primary care relevant 2014 CMS CQM
Mixed Methods Study

• EHR-based CQM performance assessment
• A provider survey about EHR use and QI strategies
• Quantitative cross-sectional analyses between CQM performance and survey responses
• Focus groups among MU exemplars to triangulate quantitative findings
METHODS
Setting

• PPRNet--a national EHR-based PBRN
• Regular EHR data extracts for QI and research
• Reports on more than 60 CQM, 23 of which are comparable to the 2014 CMS CQM
• Practices sending data 10-1-2013 and whose providers had certified for Stage 1 MU eligible
<table>
<thead>
<tr>
<th>CMS ID</th>
<th>CMS MU Clinical Quality Measures (2014):</th>
<th>Number of eligible patients</th>
<th>Percent meeting criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>122</td>
<td>Diabetes Mellitus: Hemoglobin A1c Poor Control</td>
<td>404</td>
<td>74.50%</td>
</tr>
<tr>
<td>163</td>
<td>Diabetes Mellitus: LDL-C Management</td>
<td>341</td>
<td>54.84%</td>
</tr>
<tr>
<td>123</td>
<td>Diabetes Mellitus: Foot Exam</td>
<td>404</td>
<td>48.02%</td>
</tr>
<tr>
<td>131</td>
<td>Diabetes Mellitus: Dilated Eye Exam</td>
<td>404</td>
<td>23.51%</td>
</tr>
<tr>
<td>134</td>
<td>Diabetes: Urine Protein Screening</td>
<td>404</td>
<td>64.60%</td>
</tr>
<tr>
<td>165</td>
<td>Controlling High Blood Pressure (BP)</td>
<td>1505</td>
<td>89.57%</td>
</tr>
<tr>
<td>182</td>
<td>Ischemic Vascular Disease (CHD or atherosclerosis): LDL control</td>
<td>320</td>
<td>58.13%</td>
</tr>
<tr>
<td>164</td>
<td>Ischemic Vascular Disease (CHD or atherosclerosis): Use of Aspirin or Another Antithrombotic</td>
<td>365</td>
<td>80.27%</td>
</tr>
<tr>
<td>135</td>
<td>Heart Failure (HF): ACE Inhibitor or ARB Therapy</td>
<td>62</td>
<td>58.06%</td>
</tr>
<tr>
<td>144</td>
<td>Heart Failure (HF): Beta-Blocker Therapy</td>
<td>62</td>
<td>64.52%</td>
</tr>
<tr>
<td>153</td>
<td>Chlamydia Screening for Women</td>
<td>101</td>
<td>1.98%</td>
</tr>
<tr>
<td>124</td>
<td>Cervical Cancer Screening</td>
<td>758</td>
<td>65.17%</td>
</tr>
<tr>
<td>125</td>
<td>Breast Cancer Screening</td>
<td>1010</td>
<td>79.21%</td>
</tr>
<tr>
<td>130</td>
<td>Colorectal Cancer Screening</td>
<td>1729</td>
<td>71.43%</td>
</tr>
<tr>
<td>147</td>
<td>Influenza Immunization</td>
<td>3198</td>
<td>33.80%</td>
</tr>
<tr>
<td>127</td>
<td>Pneumonia Vaccination Status for Older Adults</td>
<td>1298</td>
<td>81.20%</td>
</tr>
<tr>
<td>2</td>
<td>Depression screening (adults)</td>
<td>2923</td>
<td>57.06%</td>
</tr>
<tr>
<td>128</td>
<td>Anti-depressant Medication Management</td>
<td>797</td>
<td>62.61%</td>
</tr>
<tr>
<td>138</td>
<td>Tobacco Use Screening and Cessation Intervention</td>
<td>2923</td>
<td>94.56%</td>
</tr>
<tr>
<td>126</td>
<td>Use of Appropriate Medications for Asthma</td>
<td>481</td>
<td>45.95%</td>
</tr>
<tr>
<td>154</td>
<td>Appropriate Treatment for Children with Upper Respiratory Infection (URI)</td>
<td>9</td>
<td>66.67%</td>
</tr>
<tr>
<td>156</td>
<td>Use of High-Risk Medications in the Elderly</td>
<td>1216</td>
<td>73.68%</td>
</tr>
<tr>
<td>179</td>
<td>Warfarin Time in Therapeutic Range</td>
<td>60</td>
<td>41.67%</td>
</tr>
</tbody>
</table>

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CQM Performance Assessment

• Oct 1, 2013 EHR data extract
• Practice level performance for 21 CQM (% of eligible patients meeting measure)
• Means (S.D.) 21 CQM across all practices
• SQUID --Summary Quality Index (% eligible measures each patient met)
• Practice level SQUID—mean patient SQUIDs

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Guided by two theoretical frameworks:

• PPRNet QI model *Improving Primary Care through Health Information Technology* (IPC-HIT)

• *Consolidated Framework for Implementation Research* (CFIR)
Provider Survey

- Five iterative rounds of question development and refinement
- 100 Specific questions relevant to 21 CQM;
- 27 General questions about EHR use, practice QI
- Online survey tool--REDCAP
- Pilot tested by 7 PPRNet members not participating in project
- Conducted Nov-Dec 2013
Specific Questions

For each CQM:

• Provider agreement
• Staff education
• Use of CDS (EHR reminders)
• Standing order
• EHR embedded patient education

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General Questions

• EHR Functionality
• Clinical QI Strategies
• Beliefs about EHR and QI Activities
• Administrative QI Strategies
Quantitative Analyses

• Quantified categorical items on 0-100 scale
• Mean item scores by practice
• Partial multivariate adjusted correlations between mean specific item scores and CQM measure performance
• Partial multivariate adjusted correlations between mean general item scores and SQUID
“Exemplars” Focus Groups

- Practices in ~ top tertile for the CQM-SQUID as of 10-1-2013
- Focus groups Jan 25, Feb 1 or Feb 8, 2014 in three cities
- Reviewed quantitative findings and asked for comments on validity and context-specific examples from their practice

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Qualitative Analyses

• Digital audio files transcribed imported to NVivo 10.0 as were focus group field notes
• Two independent analysts
• Deductive, inductive (constant comparison), micro-interlocutor, immersion and crystallization approaches
RESULTS
Practice Participant Flow

Diagram

1. Agreed to Participate (78)
2. Submitted Data 3rd Quarter 2013 (76)
3. Survey Completed By >50% of PCPs (71)
4. Exemplars (27)
5. Participated in focus group (23)
<table>
<thead>
<tr>
<th>Mean Percentage Adherent</th>
<th>CQM</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;80%</td>
<td>Elderly avoid hi-risk Rx, Tobacco screen/couns</td>
</tr>
<tr>
<td>70%-80%</td>
<td>DM nephropathy screen</td>
</tr>
<tr>
<td>60%-70%</td>
<td>HTN control, breast ca screen, DM LDL&lt; 100, IVD LDC&lt;100, Children URI no Ab, Pneum vaccine</td>
</tr>
<tr>
<td>50%-60%</td>
<td>Antidepressant Rx, CRC screen, HF ACE-ARB, HF BB, IVD ASA</td>
</tr>
<tr>
<td>40%-50%</td>
<td>Asthma Rx, Cervical ca screen, DM hga1c&gt;9%,</td>
</tr>
<tr>
<td>30%-40%</td>
<td>Afib warfarin in Tx range, Depression screen</td>
</tr>
<tr>
<td>20%-30%</td>
<td>Influenza vaccine</td>
</tr>
<tr>
<td>&lt;20%</td>
<td>Chlamydia screen</td>
</tr>
</tbody>
</table>

CQM-SQUID: 0.374 (.179-.631); >0.40 =”Exemplar”
Survey Respondents
N=319

- Total 349 providers (92.1% response rate)
- 73% MD/DO; 16% NP; 11% PA
- 51% Male; 49% Female
- 91% White; 97% Non-Hispanic
- Age: 28% <= 40; 31% 41-50; 26% 51-60; 15% >=61y
## Associations Between Specific Survey Category and CQM Performance

<table>
<thead>
<tr>
<th>Survey Category</th>
<th>CQMs Associated (Multivariate analyses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provider Agreement</td>
<td>CRC Screening</td>
</tr>
<tr>
<td>Staff Education</td>
<td>Breast ca screen, DM nephropathy screen, IVD ASA, Depression screen</td>
</tr>
<tr>
<td>CDS (EHR Reminders)</td>
<td>Breast, Cervical, &amp; CRC ca screen DM nephropathy screen HF: ACE/ARB &amp; BB Chlamydia, Depression screen Flu, pneum vaccines</td>
</tr>
<tr>
<td>Standing Orders</td>
<td>(Many in bivariate analyses, none when controlling for CDS use)</td>
</tr>
<tr>
<td>EHR Patient Educ</td>
<td>Cervical ca screen, HGA1C control, HF: BB</td>
</tr>
</tbody>
</table>
### Associations Between General Survey and SQUID Performance

<table>
<thead>
<tr>
<th>Survey Category</th>
<th>Associated with SQUID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EHR Functionality</strong></td>
<td>• Registries for population management</td>
</tr>
<tr>
<td><strong>Clinical QI Strategies</strong></td>
<td>--</td>
</tr>
</tbody>
</table>
| **Beliefs about EHR and QI Activities** | • EHR is helpful in achieving high quality clinical care  
• EHR is customized in practice to facilitate high quality  
• Participation in PPRNet motivating to achieve high quality |
| **Administrative QI Strategies** | • Practice member knowledge of improvement priorities  
• Members evaluating progress together  
• Leaders seeking input from team members  
• Regular staff meetings  
• Leadership commitment to “MU” of EHR |
Focus Group Observations

• “When the staff understands the clinical importance of CQM it makes them more enthusiastic about getting things done and the work is already done when we walk in the door.”

• "More direct impact when there are clear ways [for staff] to apply the education to actually improve performance.”
Major Findings

- The subject is interesting to clinicians
- EHR use does not assure high CQM performance, even when the CQM are widely endorsed by clinicians
- CDS (reminders) and registry use maybe most effective EHR QI strategies
- CDS operationalized through standing orders
Other Stage 1 and/or 2 MU requirements not associated with CQM-SQUID:

• Use of problem lists
• Providing after visit clinical summaries
• Patient portal functionalities
Study Limitations

- Participants used one EHR
- Findings dependent on accuracy of EHR data and fidelity of their incorporation in CQM
- Most observed associations low to modest strength
- Large # of associations studied, though all were pre-specified
Conclusion

Among clinicians who have certified for MU, organizational factors related to EHR implementation, such as purposeful use of EHR functionality coupled with staff education in a milieu where QI and the EHR are valued and supported, are associated with higher performance on primary care-relevant CQM. High quality care requires more than MU certification.