Welcome!
Logistics

WiFi Access:
- Network Name: Vendor Access
- No Password Needed

Bathroom Access:
- Bathrooms are located in the hall
- Passcode: 315

Lunch
- Due to funding restrictions, we are unable to provide lunch
- A list of nearby restaurants has been provided
- If you would like to order delivery, the online delivery service Grubhub will deliver from a variety of local restaurants
Warming Up...
## Getting to know each other

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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<tr>
<td>&quot;e-Patient Dave&quot; de Bronkart</td>
<td>e-Patient Dave LLC</td>
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<tr>
<td>Barbara McNeil</td>
<td>Harvard Medical School</td>
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<td>Barry Blumenfeld</td>
<td>RTI</td>
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<td>Blackford Middleton</td>
<td>Apervita</td>
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<td>Cheryl Modica</td>
<td>National Association of Community Health Centers, Inc.</td>
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<td>Craig Umscheid</td>
<td>University of Pennsylvania</td>
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<td>Daniel van Leeuwen</td>
<td>Health Hats</td>
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<td>Dr. Tiffani J. Bright</td>
<td>AHRQ</td>
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<td>Edna Boone</td>
<td>Independent Federal Contractor</td>
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<td>Edwin Lomotan</td>
<td>AHRQ</td>
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<td>Eric Miller</td>
<td>Squishymedia</td>
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<td>Geoff Crawford</td>
<td>Anthem Inc.</td>
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<td>J. Marc Overhage</td>
<td>Cerner</td>
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<td>Jerry Osheroff</td>
<td>TMIT Consulting, LLC</td>
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<td>Jon Wald</td>
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<td>Jonathan Teich</td>
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<td>Joshua Richardson</td>
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<td>Justin Cross</td>
<td>Office of the National Coordinator for Health IT</td>
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<td>Kenrick Cato</td>
<td>Columbia University</td>
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<td>Laura Marcial</td>
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<td>Geisinger Health System</td>
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<td>Melissa Callaham</td>
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<td>Pat Mastors</td>
<td>Patients' View Institute</td>
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<td>Rob McCready</td>
<td>MITRE</td>
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<tr>
<td>Sarah Corley</td>
<td>Internal Medicine Associates</td>
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Introduction
Welcome Everyone!

Today’s Objectives:

- Review the PCOR CDS-LN’s Aims and Achievements over our first 9 months

- Examine Current state, Opportunities, and Challenges to the dissemination of PCOR-enabled CDS

- Elicit ideas on Strategic Actions and Activities for the PCOR CDS-LN to pursue in 2017 and beyond
Facilitating our Work

**PCOR CDS Learning Network**

**2016 Annual Conference & Strategic Planning Meeting**

**Objectives**
- Review our Aims & Achievements
- Examine current state, opportunities & challenges to dissemination
- Elicit your ideas for strategic actions and activities

**Agenda**
- Welcome
- Introductions/Team Building
- **BREAK**
- Opportunities & Challenges
- Discussion: Refining Strategic Activities
- **BREAK**
- Use Case
- Small Group Discussions... Your guidance
- **BREAK**
- Report Out & Wrap up
- **BREAK**
- Steering Committee Meeting

**Roles**
- Stakeholders: Engage, look for synergies
- POOR CDS Team: Listen, absorb
- Patron: Listen, help move the discussion

**Rules**
- Unconditional positive regard
- Focus on priorities
- Focus on action
- Anticipate messiness
- Take care of yourself

**Accelerating Research & Learning**

**An ecosystem producing better patient care & outcomes**
Morning Session: Opportunities and Challenges in PCOR-based CDS
Presentations:

1. Edwin Lomotan, MD: Accelerating Evidence into Practice: AHRQ’s Patient-Centered Outcomes Research Clinical Decision Support Initiative

2. Barry Blumenfeld MD,MS: The Patient Centered Outcomes Research Clinical Decision Support Learning Network (PCOR CDS-LN)


4. Robert Greenes, MD, PhD: The New Landscape - Implications

5. Kensaku Kawamoto, MD, PhD, MHS: CDS Standards: Current State and Proposed Next Steps

6. Jerome Osheroff, MD: Driving Change: Actions and Activities
Accelerating Evidence into Practice: AHRQ’s Patient-Centered Outcomes Research Clinical Decision Support Initiative

Edwin Lomotan, MD
Center for Evidence and Practice Improvement
Division of Health IT
Agency For Healthcare Research and Quality
Clinical Decision Support (CDS) History at AHRQ

- Research and evidence
  - CDS Demonstrations (2008-2013)
    - Clinical Decision Support Consortium
    - GuideLines Into DEcision Support
  - Investigator-initiated CDS research (many)

- Tools and training
    - CDS “Five Rights” (Osheroff et al.)

- Measures and data
  - “eRecommendations” (2009-2011)
  - Quality Data Set (2009)
• Accelerate the use of research evidence (clinical practice guideline recommendations and underlying evidence) in clinical practice through CDS
  – For the AHRQ CDS initiative, the focus is on patient-centered outcomes research (PCOR) findings

• Bring CDS closer to being a health IT standards-based, shareable, public resource
  – Re-usable CDS “artifacts”
  – Tools and repository
How to Reach Us

- Join the conversation at [www.pcorcds-ln.org](http://www.pcorcds-ln.org)

- For questions about the AHRQ CDS funding opportunities
  - [PCORClinicalDecisionSupport@ahrq.hhs.gov](mailto:PCORClinicalDecisionSupport@ahrq.hhs.gov)

- For questions about our PCOR CDS initiative
  - [Edwin.Lomotan@ahrq.hhs.gov](mailto:Edwin.Lomotan@ahrq.hhs.gov) – Edwin Lomotan, AHRQ
  - [bhb.@rti.org](mailto:bhb.@rti.org) – Barry Blumenfeld, PCOR CDS-LN
  - [rmccready@mitre.org](mailto:rmccready@mitre.org) - Rob McCready, MITRE
1. PCOR CDS Learning Network: [www.pcorcds-ln.org](http://www.pcorcds-ln.org)

2. Prototype infrastructure for demonstrating and sharing CDS

3. Funding opportunities to scale and develop PCOR CDS

4. Evaluation
Health Federally-Funded Research and Development Center (FFRDC)
Clinical Decision Support Funding Opportunities

http://www.ahrq.gov/funding/fund-opps/index.html
Update: The Patient-Centered Outcomes Research Clinical Decision Support Learning Network (PCOR CDS-LN)

Barry Blumenfeld, MD, MS
PI, PCOR CDS-LN
RTI International

Transforming Patient-Centered Outcomes Research Findings into Action
PCOR CDS-LN

- 4 year Cooperative agreement awarded by AHRQ
- Period of performance: 4/2016 – 1/31/2020
- PI: Barry Blumenfeld, MD, MS, (bhb@rti.org)
- Program Officer: Edwin Lomotan (Edwin.Lomotan@ahrq.hh.gov)
- Associate Program Official: Tiffani Bright (Tiffani.Bright@ahrq.hhs.gov)
- Senior Investigators: Blackford Middleton, MD, MPH, MSc and Jerome Osheroff, MD, Robert Greenes, MD, PhD, and Kensaku Kawamoto, MD, PhD, MHS

Founding Aims of the PCOR CDS-LN

- Convene, implement, and initiate operations of a learning network of multiple stakeholders with an interest in disseminating and enabling dissemination PCOR findings through CDS

- Identify barriers and facilitators and formulate recommendations for enabling PCOR findings dissemination into clinical workflows using CDS
**Mission**
The PCOR CDS-LN’s mission is to accelerate collaborative learning, overcome barriers, and reinforce facilitators for effective PCOR-enabled CDS use, and evaluate the impact of its efforts.

**Vision**
Our vision is to enable an ecosystem that allows all stakeholders to reduce the friction of turning knowledge from PCOR findings into CDS-enabled actions that produce better care and outcomes.
**Definitions**

**PCOR IS...**
The ACA defines PCOR as, “comparative clinical effectiveness research on the impact of patient health outcomes of two or more preventive, diagnostic, treatment, or health care delivery approaches.”

**CDS is...**
Clinical Decision Support (CDS) is a process for enhancing health-related decisions and actions with pertinent, organized clinical knowledge and patient information to improve health and healthcare delivery. Information recipients can include patients, clinicians and others involved in patient care delivery; information delivered can include general clinical knowledge and guidance, intelligently processed patient data, or a mixture of both; and information delivery formats can be drawn from a rich palette of options that includes data and order entry facilitators, filtered data displays, reference information, alerts and others.

**PCOR-enabled CDS is...**
PCOR-enabled CDS helps patients and their care teams apply evidence from patient-centered outcomes research to enhance care processes and their results. Approaches include promoting shared decision-making, incorporating patient reported outcomes, factoring in patient preferences to generate patient-specific recommendations for care and others.
April 2016 – December 2017

- Created and Convened Governance Structures
- Performed Environmental Scan and Disseminated Results
- Developed Analytic Framework for Action
- Launched Phase II Website
- Launched Webinars
- Launched Barriers and Facilitators Work Group (BFWG)
- Began Producing and Publishing PCOR CDS-related content
- Conducted First Annual Meeting
Six areas of focus around the prioritization, implementation, and evaluation of PCOR-based CDS.

Represents the lifecycle of activities that must occur to disseminate PCOR through CDS, measure impact, and create a learning system.

Provides a means for organizing the findings, recommendations, and actions for the PCOR CDS-LN.
PCOR CDS-LN Activities in 2017 and Beyond

- Collaboration with Major Federal Initiatives
- Collaboration and Support for Research Initiatives
- Social Media Feeds
- Member Blogs
- Work Groups
- Advisory Council

PCOR CDS related Bibliography and Glossary

Links to Key Initiatives
- Briefs
- eJournal

Webinars

2017 2018 2019
Opportunity and landscape introduction

Blackford Middleton, MD, MPH, MSc
Chief Informatics and Innovation Officer, Apervita, Inc.
Lecturer, Health Policy and Management,
& Policy Translation and Leadership Development
Harvard TH Chan School of Public Health
Co-Chair, Patient-centered Outcomes Research Clinical Decision Support
Learning Network Steering Committee
CDS SME, Project Connect, MITRE
A perfect storm for CDS?

- Lots of clinical data going online
  - Increasing standardization, interoperability
- Lots of genetic data coming
- Lots of personal/social data coming
- Lots of geospatial data coming
- Inexorable rise of Healthcare costs...
- Toward Value-based purchasing...
- The complexity and volume of knowledge (High Velocity Medicine)
  - Improving online knowledge resources
  - Improving abilities to access and use external knowledge-based tools and services
  - Improving abilities to access appropriate insertion points in EMRs and clinical workflow
The Central Problem

• Why is it so hard to transform care with even the best health IT?

• Simply put: the chasm which exists between published knowledge and clinical experience, and implemented knowledge in health IT, is too wide for the average clinician or healthcare delivery organization to manage.
CDS “Unified Approach”

Clinical guidelines
Local protocols
Experience

CDSC “L2”
GEM Import

CDSC “L3”
Duodecim Import
GRADE Import

CDSC “L4”
OpenCDS
CDS cloud service

Clinical Knowledge

Structured Knowledge

Encoded and Machine-Interpretable Knowledge

Decision Support Service

EHRs

CDS Performance Data

$25B

HeD KAS 1

HeD KAS 2

Kawamoto K, Middleton B,
Reider J, Rosendale D, Schiffman R.
From Guidelines to Clinical Decision Support: a
Unified Approach to Translating and
Implementing Knowledge
AMIA Panel Presentation, Chicago, IL 2012

“CDSC” = CDS Consortium
CDS Marketplace Current State

CDS Resource Sharing and Use. Discern Health
Recommendations to Office Clinical Quality and Safety, ONC, 2015
CDS Marketplace Preferred State

Supply

Generation

Translation

Standards and automation to support efficient translation

Exchange

Competition increases benefits and lowers cost

Demand

Integration

Use

Awareness of benefits, lower cost, and trust stimulate demand

Feedback contributes to a continuously learning system

Feedback

Multiple options for users to buy

Standards and automation make customization and maintenance less costly

Discern Health, 2015
Apervita® Provides a Platform and Marketplace for CDS

Sources Include:
- Knowledge Management System
- Other Knowledge Repositories

Examples:
- HQMF/QDM
- CQL
- HED
- RDF
- OWL
- CTS2

Build & Test Analytics
- Algorithms
- Measures
- Cohorts
- Rules
- Order Sets
- Pathways

Scale Execution using Connectors
- Concept Sets
- Value Sets

Connect Data & Results
- Facts
- Events
- Populations
- Sub-Population
- Results
- Real-time, Periodic, Bulk

Monitor & Evaluate Content

Subscribe from & Publish to Marketplace

Knowledge Management

Governance & Lifecycle Management

Open Market Interface

Open Delivery Interface

Open Knowledge Interface

Format Examples:
- Spreadsheet (e.g., xls)
- Delimited (e.g., csv)
- XML
- JSON
- CDA/C-CDA
- HL7, FHIR

Sources Include:
- Corporate
- EHR
- Departmental Systems

Distribute & Deliver Broadly

Visualizations | Buttons | Context | Alerts | Input/Feedback | Web Services
Detailing the AFA

- Measuring Clinical Efficacy of CDS Interventions
- Measuring Process Changes
  - Measuring Clinical Outcomes
  - Measuring User Satisfaction: Provider
  - Measuring User Satisfaction: Patient
- Measuring Impact: Decisions, and Outcomes
  - Standardized Work Domain Ontology
  - Standardized Patient Data Model
  - Standardized Insertion points in clinical workflow
  - Localization to Existing EHR Implementation
  - Localization to Clinical Practice Norms
  - Providing Feedback to the Learning Network and CDS Authors
- External Factors
  - Marketplace
    - Legal
    - Policy
    - Governance
- Prioritizing PCOR Findings for Dissemination via CDS
  - Rating the Quality of the Evidence
  - Rating the Implementability as CDS
  - Rating the Quality Impact in Practice
  - Rating the Value in Practice (efficacy?)
- Implementing CDS Interventions
- Authoring CDS Interventions
- Measuring Decisions and Outcomes
- Learning from PCOR-Based CDS Experience
- Prioritizing PCOR Findings for Dissemination via CDS
- Implementing CDS Interventions
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- Authoring CDS Interventions
Analytic Framework for Action – Dependent Issues

- Standardized Work Domain
- Ontology
- Standardized Patient Data Model

- Measuring Clinical Efficacy of CDS Interventions
- Measuring Process Changes
- Measuring Clinical Outcomes
- Measuring User Satisfaction: Provider
- Measuring User Satisfaction: Patient

- Measuring Impact: Decisions, and Outcomes

- Learning Network and CDS
- Authors

- QI Context
The New Landscape - Implications

Robert A. Greenes, MD, PhD
Professor and Ira A. Fulton Chair in Biomedical Informatics
Arizona State University
Professor, Biomedical Informatics, Mayo Clinic
Director, Health IT Innovation Collaborative (HII-C)
Foci of CDS over past 30+ years ...

- **Integration of knowledge artifacts into EHR**
  - Order sets, rules, documentation templates, infobuttons, limited protocols/guidelines, calculation tools
  - Triggered by events or user actions
    - e.g., lab result, elapsed time, infobutton selection
  - Part of workflow
    - e.g., CPOE, documentation task, protocol step

- **Proprietary editing tools and knowledge formats**
  - Limited sharing
  - Non-transparency of embedded content

- **Major effort to tailor to individual settings and workflows**
  - Resulting in many versions of same basic knowledge
  - Complexity of knowledge management and of updating
  - Not easily done except in larger institutions
Foci of CDS over past 30+ years ...

→ Even with HITECH and Meaningful Use, we have not seen a great uptick in CDS adoption
  – It is just too much effort!
The Perfect Storm – concurrent health system disruptors

- National stimuli
  - EHR adoption, Meaningful Use, ...
- Precision medicine
  - Omics, sensors, technology advances, knowledge explosion
- Aging population
  - Ever larger part of the healthcare $ 
- Runaway costs
  - Pay for value / outcomes
- Empowered consumer
- App culture
These disruptors are forcing new paradigms

**Shift from disease treatment emphasis**

→ **wellness/ prevention/ early intervention**

→ “**Person-centeredness**”

- **Connected care**
  - Combining multiple input sources
    - EHRs, sensors, wearables; genome; personal data; imaging
  - Integrated provider-patient interaction

- **Multiple venues for care**
  - Service line integration
  - Coordination of care

- **Integration of big data analytics**
  - From above sources
    - For population / cohort management & tracking
    - For quality monitoring
    - For point of care
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    - For population / cohort management & tracking
    - For quality monitoring
    - For point of care
Need for new tools to manage complexity

- Cognitive models of related data, timelines, interactions
  - To treat care as a process not an episode
  - To work with an integrated problem list and integrated care plan
  - Interactions/conflicts identified
Need for new tools to manage complexity

- **Dashboards**
  - Practice-, panel-, and patient-level
Need for new tools to manage complexity

- **Analytics to identify cohorts needing attention**
  - Provider actions, patient deviations, patient risks

**Finding/Decision**  
**Order/Action**  
**Conditions/Outcome**

*Courtesy of M. Van Kooy, Aspen Advisors, and K. Bunkers, Mayo Clinic*
Another consideration: Granularity of focus

Are we implementing best practice at the level of individual knowledge artifacts?

- Use therapy A rather than B
  - If so, need to insert into the care process at the appropriate points, with all the difficulties in accomplishing this
Another consideration: Granularity of focus

Are we implementing best practice at the level of individual knowledge artifacts?
  - Use therapy A rather than B
    • If so, need to insert into the care process at the appropriate points, with all the difficulties in accomplishing this

Or are we implementing guidelines for particular management challenges?
  - Hypertension, CHF, diabetes, ... condition X, condition Y
  - Optimal care process model
    • Best attacked at the level of the care process
    • With many touch points
    • With feedback on compliance, quality measures, efficacy, etc.
Another consideration: Granularity of focus

Are we implementing best practice at the level of individual knowledge artifacts?

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Or are we implementing guidelines for particular management challenges?

- Hypertension, CHF, diabetes, ... condition X, condition Y
- Optimal care process model
  - Best attacked at the level of the care process
  - With many touch points
  - With feedback on compliance, quality measures, efficacy, etc.

The answer of course is both ... we need a multi-faceted approach
WEBINAR:
January 18, 2017 @ 1PM EST
The Transformation of our Health System - Disruptors and Implications for Clinical Decision Support

Please register at: https://attendee.gotowebinar.com/register/5647794686560632323.

(After registering, you will receive a confirmation email containing information about joining the webinar.)
CDS Standards: Current State and Proposed Next Steps

Kensaku Kawamoto, MD, PhD, MHS
Associate Chief Medical Information Officer, University of Utah
Co-Chair, HL7 Clinical Decision Support Work Group
Initiative Coordinator, ONC Health eDecisions (HeD)
Co-Initiative Coordinator, ONC Clinical Quality Framework (CQF)
CDS Interoperability Paradigms

- Standard knowledge artifact: *write once, interpret anywhere*

- Standard patient evaluation service: *write once, use anywhere*

- Standard “apps”: *write once, embed anywhere*
Notable Recent CDS Standardization Efforts

- Health eDecisions (HeD)
  - Public-private partnership sponsored by ONC to develop and validate CDS interoperability standards

- Clinical Quality Framework (CQF)
  - Public-private partnership sponsored by ONC and CMS to develop and validate harmonized standards for CDS and electronic clinical quality measurement (eCQM)

- SMART on FHIR
  - Traditionally focused on “apps”; expanding to patient evaluation as a service (CDS Hooks)
Welcome to FHIR®

First time here? See the executive summary, the developer's introduction, clinical introduction, or architect's introduction, and then the FHIR overview / roadmap & Timelines. See also the open license (and don't miss the full Table of Contents or you can search this specification).

http://build.fhir.org
Example: Standard Knowledge (Documentation Template)

© 2015 Evinance. Used with permission.
Example: Standard Decision Support Service

Chlamydia Screening Rule in KAS + CQL + QUICK

© 2015 Avhana LLC. Used with permission.
Example: SMART on FHIR Bilirubin App with FHIR Clinical Reasoning Decision Support
## Critical Needs and Proposed Next Steps (Limited to Those with Feasible 1-Year Plan)

<table>
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<th>Critical Need</th>
<th>Proposed Next Steps Over Next Year</th>
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| **Identification of CDS integration capabilities already supported** by major EHR vendors | - Discussion this afternoon to identify what is already possible in major vendor systems  
- Follow-up discussions as needed  
- Potentially a collaborative manuscript |
| Rationale: it is much easier to standardize existing functionality (e.g., via middleware) than to implement new functionality | |
| **Prioritization of new CDS integration capabilities** not already supported by major EHR vendors (e.g., import/export of static order sets) | - Same as above, plus vendor assessment of effort required to enable support |
| **Piloting and production deployment** of interoperable CDS capabilities | - Use of existing standards for already-funded CDS initiatives, with support from PCOR CDS-LN and ONC CQF initiative  
- Refinement of standards based on implementation experience |
| Rationale: actual use of standards is critical to ensuring usability | |
WEBINAR:
December 21, 2016 @ 11AM EST
PCOR Clinical Decision Support Interoperability Standards

Please register at: https://attendee.gotowebinar.com/register/6744090242823131649. (After registering, you will receive a confirmation email containing information about joining the webinar.)
Driving Change: Actions and Activities

Jerome A. Osheroff, MD
Principal/Founder, TMIT Consulting, LLC
Co-Chair, Patient-centered Outcomes Research Clinical Decision Support Learning Network Steering Committee
Adjunct Associate Professor of Medicine, University of Pennsylvania
Focus on Most Important Opportunities

- Engage critical mass of stakeholders
- Define/deliver win-win-wins
- Produce action, not just reports
- Leverage complementary initiatives
Analytic Framework for **Action**

- Where do **you** live/work in framework?
- What are your pertinent:
  - Needs?
  - Challenges?
  - Networks?
  - Capabilities?
  - Opportunities?
- What steps can you take **now** toward a win-win-win?
Cultivate Synergies with Related Initiatives

- ONC Driving Quality Improvement Collaborative
- Transforming Clinical Practice Initiative
- Other Broad Public/Private Transformation Efforts
  - e.g., National Academy of Medicine, MITRE Connect, Standards efforts, many others
- Target-focused Initiatives
  - Million Hearts ®
    - SMBP
    - Evidence Now
  - Many others
- Local CDS-enabled QI Efforts

What can you do to help us ‘catch the wind’ from these related initiatives?
Use Cases to ‘Make it Real’

Use Case Dimensions:
- Current state
- Barriers
- Facilitators
- Recommendations
- Stakeholder Actions

Topics
- SMBP (BFWG)
- Genetic Testing
- Peripheral Arterial Dz (R18 Submitter)

- What additional use cases can you facilitate connections for?
- What ‘Stakeholder Actions’ for each can you help drive?
What will it take to make PCOR-CDS LN a vibrant collaboration hub that drives high-value win-win-wins?

▪ Key organization/initiative connections:
  – Which?
  – How?
▪ Next steps to engage/support current LN members?
  – Including you!
▪ Other critical next steps?
This meeting isn’t a spectator event!

- Think/takes notes/share throughout the day
  - Speak up!

- Recap of questions I’ve posed
  - How can you cultivate synergies between your work and AFA-related work?
  - Which national PCOR/CDS/QI activities should we working with? How?
  - What additional use cases and related actions can you help cultivate?
  - How can we make the PCOR CDS-LN a vibrant and valuable collaboration hub?

- Define valuable **actions** during rest of day (and then help execute)
Group Discussion: Advancing the Strategic Role of the PCOR CDS-LN
Let’s Talk!

Our vision:
Enable an ecosystem that allows all stakeholders to reduce the friction of turning knowledge from PCOR findings into CDS-enabled actions that produce better care and outcomes.

▪ What high priority actions are needed to achieve that vision?
▪ What complementary initiatives and resources might be leveraged?
▪ What specific actions might be taken by individuals/groups to achieve our vision?
  – How can you cultivate synergies between your work and AFA-related work?
  – What additional use cases and related actions can you help cultivate?
▪ How can we make the PCOR CDS-LN a vibrant and valuable collaboration hub?
Lunch Break
Barriers and Facilitators Work Group (BFWG) Update

Sarah Corley, MD, FACP, FHIMSS
President, Internal Medicine Associates
Chair, PCOR CDS-LN Barriers and Facilitators Work Group

Joshua Richardson, PhD, MS, MLIS
Health IT Research Scientist, RTI International
Co-Chair, PCOR CDS-LN Barriers and Facilitators Work Group
“…what will the [PCOR-based] CDS will look like?”

“What is the use case for PCOR-based CDS?”

“…does PCOR look like CER? There’s the assessment of the evidence, but then how is it turned around to make it patient-centered?”

“What does version 1 look like?”
Beneficiary Engagement and Incentives: Direct Decision Support (DDS) Model

The Centers for Medicare & Medicaid Services (CMS) identifies strengthening beneficiary engagement as one of the agency's goals to help transform our health care system into one that delivers better care, smarter spending, healthier people, and puts individuals at the center. Specifically, the "CMS Quality Strategy envisions health and care that is person-centered, provides incentives for the right outcomes, is sustainable, emphasizes coordinated care and shared decision making, and relies on transparency of quality and cost information."

Background

Beneficiary engagement broadly refers to the actions and choices of individuals with regard to their health and health care, and these decisions impact cost, quality, and patient satisfaction outcomes. The Beneficiary Engagement and Incentives (BEI) Models – the Shared Decision Making Model and the...
1. Determine PCOR findings related to a specific clinical improvement imperative (e.g., hypertension control)
2. Identify barriers and facilitators to instantiating and widely implementing PCOR findings based on the AFA
3. Recommend ways to overcome barriers and catalyze opportunities for PCOR-based CDS to promote improved care decisions, care processes, and actions
4. Generalize results that elucidate for others the barriers, facilitators and recommendations for PCOR based CDS
1. Propose criteria for selecting PCOR findings to be used as use cases
2. Determine PCOR findings to be applied in use cases
3. Populate a use case matrix (see below), which is organized by the Analytic Framework for Action based on the PCOR
4. Disseminate findings at two time points
   ▪ Present work-to-date at the Annual Conference
   ▪ Present a written report of 3 use cases at the end of year 1 (September 2017)
Team Contributors

- Recruited multi-stakeholder representatives
  - Chair - Sarah Corley, MD, FACP, FHIMSS (Internal Medicine Associates)
  - Co-Chair - Joshua Richardson, PhD, MS, MLIS (RTI)
  - Geoffrey Crawford, MD, MS (Anthem, Inc.)
  - Laura Haak Marcial, PhD, MLIS (RTI)
  - Victor Lee, MD (Zynx, Inc.)
  - Mary Quilty, SM (MITRE Corp.)
  - Danny van Leeuwen, MPH, RN, CPHQ (Health Hats)
- 6 meetings from 10/25/2016 - 11/30/2016
- Leverage Advisory Council/broad membership for input into WGs activities
- Provided updates to Steering Committee and Executive Team
- Have not conducted a deep dive into measures
Selecting a PCOR Intervention
Determining a PCOR Guideline

- Searches (Guidelines.gov) and personal knowledge
- Novel interventions, ones not widely used
- Conditions considered:
  - Hyperlipidemia – strong evidentiary basis for treatment recommendations
  - Low back pain – many treatment options but lacks strong evidence
  - Polypharmacy, immunizations, depression...
- Hypertension
  - Strong evidentiary basis for treatment conditions
  - Opportunity for diagnosis enhancement (office + home CDS)
- But what is PCOR for hypertension care?
Million Hearts Initiative: SMBP Monitoring

http://millionhearts.hhs.gov/tools-protocols/smbp.html
Determining PCOR Guideline Criteria

Note we did not first rely on selection criteria to find PCOR
<table>
<thead>
<tr>
<th>PCOR selection criteria</th>
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<tbody>
<tr>
<td><strong>Condition type</strong> (physical, mental)</td>
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<tr>
<td><strong>Care setting</strong> (inpatient, outpatient, LTC, home care, other)</td>
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<tr>
<td><strong>Patient age</strong> (older adult, adult, peds)</td>
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<td><strong>AHRQ priority population(s)</strong></td>
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<tr>
<td><strong>Patient-centered measure</strong> (informed by community-based participatory research, involves patient-reported data, other)</td>
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<tr>
<td><strong>Recommending organization</strong> (USPSTF, NQF, etc.)</td>
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<tr>
<td><strong>Level of evidence, supporting research</strong> (guideline, recommendation, meta-analysis, RCT)</td>
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<tr>
<td><strong>Payer priority</strong> (Medicare/Medicaid, private, other)</td>
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<tr>
<td><strong>Payer support</strong> (% of payers who cover equipment costs SMBP Monitoring?)</td>
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<td><strong>Intended end user</strong> of the PCOR-based CDS (clinician, patient, caregiver, other)</td>
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Identifying Barriers and Facilitators
Basing Barriers and Facilitators around the AFA

Addressing External Factors: Marketplace – Policy – Legal – Governance

- Prioritizing PCOR Findings for Dissemination via CDS
- Learning from PCOR-Based CDS Experience
- Authoring CDS Interventions
- Implementing CDS Interventions
- Measuring Decisions and Outcomes
## Identifying Barriers and Facilitators

<table>
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<tr>
<th>Addressing External Factors</th>
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<tr>
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<td>(What findings are appropriate given level of evidence, priorities, available data, etc)</td>
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# Identifying Barriers and Facilitators

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Takeaways
Finding: There may be a need to help navigate people to and then prioritize PCOR

Our Experience:
- Current resources (e.g. guidelines.gov) didn’t help to narrow
- The BFWG arrived at SMBP Monitoring through our network of experts rather than a particular source

Recommendation: Invent or build on an existing repository with vetted PCOR by levels of implementability
- See eGLIA
- See equator network
- See also AGREE II
### Project: Million Hearts PCOR-based CDS

**Recommendation SMBP Monitoring:** Increase use of self-measured blood pressure monitoring (SMBP) among those with hypertension through clinical providers, community supports, state health officer, and payer actions.

### Effect On Process Of Care - the degree to which the recommendation impacts upon the usual workflow of a care setting

<table>
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<tr>
<th>Question</th>
<th>Appraisal</th>
<th>Comments</th>
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<tr>
<td>20 Can the recommendation be carried out without substantial disruption in current workflow?</td>
<td>Yes, No, NA, Reset</td>
<td></td>
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<td>21 Can the recommendation be pilot tested without substantial resource commitment? <em>For example, buying and installing expensive equipment to comply with a recommendation is not easily reversible.</em></td>
<td>Yes, No, NA, Reset</td>
<td></td>
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</table>

At first recommendation

- Previous Dimension
- Main Menu
- Next Dimension

At last recommendation
Finding: PCOR-based material not offered in any type of machine-readable format

Our Experience:
- The SMBP Monitoring guideline is a narrative handout geared to clinicians and patients
- The SMBP Monitoring guideline and others elsewhere don’t provide machine-readable logic

Recommendation: Work with CDC to plan and develop its SMBP Monitoring guideline as CDS
SMBP Example

**Prepare Care Teams to Support SMBP**
- Standardize training
- Understand laws and regulations
- Train relevant members of the care team
- Standardize treatment

**Select and Incorporate Clinical Support Systems**
- Use an existing model
- Establish a feedback loop
- Reach out to partners with health information technology (HIT) expertise

**Empower Patients to Use SMBP**
- Discuss BP and SMBP
- Choose device
- Check accuracy
- Provide SMBP training
- Provide written guidance
- Choose a BP tracking method
- Subsidize device

**Encourage Payer Coverage of SMBP**
- Understand health plan reimbursement
- Collaborate with partners
- Understand laws and regulations
SMBP Example (detail)

Prepare Care Teams to Support SMBP
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Encourage Payer Coverage of SMBP
- Understand health plan reimbursement
- Collaborate with partners
- Understand laws and regulations
Finding: Unclear how SMBP monitoring data will be accurately and consistently reported in the patient record

Our experience:
- What, if any, PCOR evidence is there around reminders for patients at home to self measure BP?
- How do data in SMBP reflect factors such as device type (ambulatory BP monitor vs home BP monitor), patient position (supine vs sitting), etc.?

Recommendation: Collaborate with researchers and vendors around ways to structure and capture SMBP monitoring data
Key Lessons

- Make sure that key data (e.g., BP readings documented in both EHR and registry) is reliable. That is, the measurement itself and how it is recorded must be consistently accurate. It is important to trust the data you are using to make individual patient decisions and to track, report and improve population-based quality measures. Seek system vendor support on this.
Next steps

**Current status**
1. Proposed criteria for selecting PCOR findings to be used as use cases
2. Determined PCOR findings to be applied in use cases
3. Populating a use case matrix organized by the AFA

**Next steps**
1. Continue populating the matrix
2. Identify 2 more PCOR findings for use cases
3. Share lessons learned with MITRE’s project team
4. Get your feedback and recommendations
5. (the BFWG will be meeting less regularly)
Audience questions

What more can the BFWG do to build understanding around the barriers and facilitators to PCOR-based CDS?

Are there conditions you recommend the BFWG look to for the next round of use cases?

Are there stakeholders you would like to see on the BFWG that aren’t currently represented?
THANKS...!

...to the volunteers on the BFWG:

- Chair - **Sarah Corley**, MD, FACP, FHIMSS (Internal Medicine Associates)
- **Geoffrey Crawford**, MD, MS (Anthem, Inc.)
- **Victor Lee**, MD (Zynx, Inc.)
- **Mary Quilty**, SM (MITRE Corp.)
- **Danny van Leeuwen**, MPH, RN, CPHQ (Health Hats)
- **Hilary Wall**, MPH (CDC)
Next up - Break-out Sessions

- You will divide up into groups (4 in-person, 1 online--Learning)
- Each group will be assigned one sector of the AFA
- You will be provided material with all of the barriers and facilitators to date for that sector
- Goal will be to develop recommendations for short and long term actions to reduce the friction of turning knowledge from PCOR findings into CDS-enabled actions that produce better care and outcomes

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<th>Recommended Actions</th>
<th>Timeframe</th>
<th>Priority</th>
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</table>
Analytic Framework for Action (breakout sessions)
<table>
<thead>
<tr>
<th>Breakout Group</th>
<th>Facilitator</th>
<th>Location</th>
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<tbody>
<tr>
<td>Prioritizing/Learning</td>
<td>Blackford Middleton</td>
<td>Main Conference Room</td>
</tr>
<tr>
<td>Authoring/Learning</td>
<td>Ken Kawamoto</td>
<td>Conference Room 7089</td>
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<tr>
<td>Implementing/Learning</td>
<td>Jerry Osheroff</td>
<td>7000a</td>
</tr>
<tr>
<td>Measuring/Learning</td>
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<td>Melissa Callaham</td>
<td>Think Tank (Virtual)</td>
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<td>Participants</td>
<td>• Offer comments, ideas, and suggestions</td>
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<td></td>
<td>• Responsible for the <em>quality of the content</em></td>
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<tr>
<td>Facilitators and Notetakers</td>
<td>• Lead group discussions</td>
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<td></td>
<td>• Keep group on time and on topic</td>
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<td></td>
<td>• Responsible for <em>process not content</em></td>
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<tr>
<td></td>
<td>• Take notes and produce meeting results document</td>
</tr>
</tbody>
</table>
• Think boldly about moving forward... *be visionary*
• Share your ideas and concerns... *participate*
• Offer pro-active ideas... *be action oriented*
• Refrain from speech making... *be concise*
• Mobile devices, cell phones, laptops – set aside, use during breaks... *be polite*

• **Remember the Ground Rules:**
  • *Unconditional Positive Regard*
  • *Focus on the Priorities*
  • *Focus on Action*
  • *Anticipate Messiness*
  • *Take care of Yourself*
Prioritizing
AFA (detail)

Addressing External Factors: Marketplace – Policy – Legal – Governance

- Measuring Clinical Efficacy of CDS Interventions
- Measuring Process Changes
- Measuring Clinical Outcomes
- Measuring User Satisfaction: Provider
- Measuring User Satisfaction: Patient
- Standardized Work Domain Ontology
- Standardized Patient Data Model
- Standardized Insertion points in clinical workflow
- Localization to Existing EHR Implementation
- Localization to Clinical Practice Norms
- Providing Feedback to the Learning Network and CDS Authors
- Implementing CDS Interventions
- Prioritizing PCOR Findings for Dissemination via CDS
- Rating the Quality of the Evidence
- Rating the Implementability as CDS
- Rating the Quality Impact in Practice
- Rating the Value in Practice (efficacy?)
- Standardized Patient Data
- Standardized Knowledge Representation
- Standardized Workflow Insertion points
- Standardized Interaction Model
## Charge:

Using the template provided, please develop a set of strategic recommendations to guide the short term and long term actions of the PCOR CDS-LN.

For your reference, we have included a summary table of the barriers and facilitators.

### Ground Rules:

* Unconditional Positive Regard
* Focus on the Priorities
* Focus on Action
* Anticipate Messiness
* Take care of Yourself

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Authoring
Learning from PCOR-Based CDS Experience

Prioritizing PCOR Findings for Dissemination via CDS

Implementing CDS Interventions

Authoring CDS Interventions

Measuring Decisions and Outcomes

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Standardized Knowledge Representation

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<th>Critical Need</th>
<th>Proposed Next Steps Over Next Year</th>
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</thead>
<tbody>
<tr>
<td><strong>Identification of CDS integration capabilities already supported</strong> by major EHR vendors&lt;br&gt;Rationale: it is much easier to standardize existing functionality (e.g., via middleware) than to implement new functionality</td>
<td>- Discussion this afternoon to identify what is already possible in major vendor systems&lt;br&gt;- Follow-up discussions as needed&lt;br&gt;- Potentially a collaborative manuscript</td>
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<td><strong>Prioritization of new CDS integration capabilities</strong> not already supported by major EHR vendors (e.g., import/export of static order sets)</td>
<td>- Same as above, plus vendor assessment of effort required to enable support</td>
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<tr>
<td><strong>Piloting and production deployment</strong> of interoperable CDS capabilities&lt;br&gt;Rationale: actual use of standards is critical to ensuring usability</td>
<td>- Use of existing standards for already-funded CDS initiatives, with support from PCOR CDS-LN and ONC CQF initiative&lt;br&gt;- Refinement of standards based on implementation experience</td>
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### Authoring

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**Charge:**

Using the template provided, please develop a set of strategic recommendations to guide the short term and long term actions of the PCOR CDS-LN.

For your reference, we have included a summary table of the barriers and facilitators.

**Ground Rules:**

* Unconditional Positive Regard *
* Focus on the Priorities *
* Focus on Action *
* Anticipate Messiness *
* Take care of Yourself
Implementing
AFA (detail)
**Implementing**

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Measuring
AFA (detail)
**Measuring**

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For your reference, we have included a summary table of the barriers and facilitators.
Learning
Learning from PCOR-Based CDS Experience

Prioritizing PCOR Findings for Dissemination via CDS

Implementing CDS Interventions

Authoring CDS Interventions

Measuring Decisions and Outcomes

Measuring Clinical Efficacy of CDS Interventions

Measuring Process Changes

Measuring Clinical Outcomes

Measuring Impact: Decisions, and Outcomes

Standardized Work Domain Ontology

Standardized Patient Data Model

Standardized Insertion points in clinical workflow

Localization to Existing EHR Implementation

Localization to Clinical Practice Norms

Providing Feedback to the Learning Network and CDS Authors

Addressing External Factors: Marketplace - Policy - Legal - Governance

Marketplace

Legal

Policy

Governance

External Factors

Rating the Quality of the Evidence

Rating the Implementability as CDS

Rating the Quality Impact in Practice

Rating the Value in Practice (efficacy?)

Standardized Patient Data

Standardized Knowledge Representation

Standardized Workflow Insertion points

Standardized Interaction Model
## Learning

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- Take care of Yourself
Report Out
Disclosures
In the past year, I have been a consultant or sponsored researcher on clinical decision support for:

- Office of the National Coordinator for Health IT*
- McKesson InterQual
- Hitachi

*via ESAC, SRS, Hausam Consulting, and A+ Government Solutions
Extra stuff.... (for now)