From Evidence to Encounter:
Accelerating Clinical Quality

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Has no real or apparent conflicts of interest to report.
Agenda

• Introduce VA and business context for sharable pathways
• Present key ACTS findings as related to evidence-based medicine and Veteran care
• Discuss key takeaways and pain points from our experience
• Describe and demonstrate evidence-based, policy-driven protocols
• Illustrate the overall value and business case for society involvement
• Introduce the BPM+ Community of Practice
Learning Objectives

• Understand implications of the use of Business Process Modeling language for the formal expression of clinical guidelines, pathways, and workflows

• Elaborate impacts of the use of standards-based expression languages in terms of authoring, distribution, and implementation of clinical best-practices

• Discuss lessons-learned from pilot adoption activities as impacting ingestion, implementation, and deployment of clinical best practices.

• Explain role of BPM+ standards in the creation of an open knowledge ecosystem
VA by the Numbers…

Statistics as of January 2020 per available public data

- VA is the largest healthcare provider in the US…
  - 9M Enrolled Beneficiaries (20.8M living veterans as of 2016)
  - 1,255 Health Care facilities
  - 170 medical centers
  - >1000 outpatient clinics
- 322,000 full time health care professionals
- 147M prescriptions filled (outpatient pharmacy and mail-out; 2016)

- 65% of physicians in US trained at the VA;
- 124k clinical staff and specialties trained at VA in 2019
- Affiliated with 144 of 152 accredited medical schools in US
- Missions around Direct Care, Medical Education, Research, and National Disaster Support
A little context

• Veterans are able to self-refer to community care in certain circumstances
• We are in the throes of a ~$16B EHR Modernization over 10 years
• Keeping pace with changing best-practices is tremendously difficult
  • HIT lags behind clinical practice needs
  • Challenges in maintaining care consistency across sites and settings
  • Limited visibility to outsourced/community care
• Veterans receive care across a host of institutions, not just VA
• Some Veterans receive no care at VA
# [A Few of] Our Challenges and Priorities

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Implication</th>
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<tbody>
<tr>
<td>Keeping pace with new/emerging clinical best-practices</td>
<td>Patients adversely affected during transition period; not “current” care</td>
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<tr>
<td>Inconsistencies in care delivery</td>
<td>Differing interpretation of guidelines; Varied care outcome depending on location</td>
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<tr>
<td>Limited visibility into outsourced/community-provided care</td>
<td>Unnecessary duplication of services; conflicting care guidance;</td>
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<tr>
<td>Difficult to consume externally-source clinical knowledge</td>
<td>Knowledge is expressed in natural language or proprietary formats; difficult to discover existing content, and to consume it.</td>
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<tr>
<td>Interoperability challenges….</td>
<td>Stemming from unclear, incomplete, inconsistent, or conflicting standards, and/or poor marketplace adoption or implementation</td>
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**ACTS Key Premise and Findings**

**Evidence-based Resources Are Underutilized**
Potential users aren’t aware of or don’t have access to valuable knowledge and tools from AHRQ and others to guide critical decisions and actions.

- Takes a long time for evidence to become standard of care.
- Much care isn’t based on evidence.
- One study found adults received ½ of recommended care.
- Resources are not easily integrated within user workflow and underlying health IT systems.

**Empower the “Quadruple Aim”**
...expanding on the role of knowledge throughout the cycle.

- Improve Health
- Enhance Patient Experience
- Improve Clinician work life
- Reduce Cost

**Solution**
A [National] Learning Health System Virtuous Cycle to achieve the “Quadruple Aim” and meet stakeholder needs better.

**Approach and Workgroups**
Advance dissemination and use of evidence-based resources, fostering a learning health system that achieves the “Quadruple Aim”.

- Future Vision
- Knowledge Marketplace
- Infrastructure and Standards
- Concept demonstrations
- Roadmap

*adapted from AHRQ/ACTS Roadmap Presentation, used with permission*
Quality Driven Emergency Care

A Point of View from the American College of Emergency Physicians

CEDR
CLINICAL EMERGENCY DATA REGISTRY

Meet your administrative & financial requirements with this CMS-designated Qualified Data Registry

E·QUAL
EMERGENCY QUALITY NETWORK

Discover low-burden, high-impact, evidence-based best practices in this virtual learning community

QUALITY MEASURES

Reduce clinician burden with quality measures linked to meaningful outcomes for clinicians & patients
Quality Driven Emergency Care (continued)

**DATA ANALYTICS PLATFORM**
Gain comprehensive insights into emergency medicine research, operations, policy & education

**HEALTH INFORMATION TECHNOLOGY**
Learn about ACEP’s leadership in informatics, electronic health record use optimization & clinician burden reduction
EM Physician Burden

• ED Patients: New, unscheduled & often
• Variable patterns of care in the ED
• Data Discovery Burden (past meds, PMH)
• Hospital EHRs: Poor workflow designs
Digital Transformation in EM

- Resource management and information flow can be made more efficient with modeling.
- Can these models inform automation to successfully manage patient flow?
- Can these models help ED physicians access the necessary patient data quickly and reduce physician burden?
An Ideal Model: Requirements

- Human & machine readable
- Broad, cross-specialty appeal (so patient-centric)
- Defined scope (e.g. clear inclusion/exclusion logic, I/O)
- Market viability
- Encompass existing best practices & policies
- Scalability (broad availability for various clinicians)
An Ideal Model Already Exists

• Business Process Management Plus (BPM+)
• 3-in-1:
  • BPMN: Business Process Model and Notation
  • CMMN: Case Management Model and Notation
  • DMN: Decision Model and Notation
Step-by-Step Process

1. Choose a Use-Case from Guidelines or Best Practices
2. Select 2-3 SMEs
3. Build BPMN Workflow
   - Inclusion Criteria
   - Decisions
4. Use CMMN for unstructured Work
   - Labs
   - Other evolving work or strategies
5. Use DMN to determine clinically relevant outputs
   - Differential diagnoses
BPM+Health – Team Investment

• SMEs
  • 2-3 experts per protocol or pathways
• Small management team 2-3 people with experience in
  • Project Management
  • Health Care
  • Models
Use Case: Lower Back Pain (LBP)

An exemplar clinical pathway based in Business Process Model and Notation (BPMN)
LBP – Start with MSK

- Focus on one, uncomplicated starting point
- Decided on an assumption of musculoskeletal pain (MSK)
LBP – Treatments

1st Line Treatments

- Administer Indomethacin [RxCUI = 634169]
- Ketorolac [RxCUI = 35827]
- Administer Acetaminophen [RxCUI = 161]

No 4167560002 [Non-steroidal anti-inflammatory drugs contraindicated (situation)]
No NSAID in past 6 hours
LBP – Treatments (continued)

2nd Line Treatments

- 39074004 [Injection of trigger points (procedure)]
- 16992002 [Osteopathic manipulation (procedure)]
- 404939002 [Mycofascial release (regime/therapy)]
- 576491004 [Product containing precisely lidocaine 50 microgram/milligram conventional release cutaneous patch (clinical drug)]
LBP – Recommendations

- 266694003 [Heat therapy (procedure)]
- 229571007 [Heat pad treatment (procedure)]
- 182857004 [Hot baths - therapy (procedure)]
- 16403005 [Non-steroidal anti-inflammatory agent (product)]

See Primary Care Provider
Key Take-Aways

• Alternatives to opioids in low back pain

  • Challenge:
    • Back pain diagnostic tree is extremely complex

  • Solution:
    • Make initial assumption (assume MSK)
    • Build a foundational protocol to which several other protocols can lead post hoc.
Next Steps

• 1\textsuperscript{st} Trimester Bleeding
  • Develop the ‘patient is unstable’ arm of the protocol

• Alternatives to opioids in low back pain
  • Add 3\textsuperscript{rd}-Line Treatments
  • Build out DMN workflows
  • Develop workflows for other branched (e.g. Neurological Pain).

• Considering new use cases: Diabetes
Overall Value

- Actively target specialty-specific gaps in care
- Collaboration with other specialties on common gaps in care
- Reduce physician and provider burden
- Capture better data
Introducing BPM+ Health

- A community-of-practice advancing sharable pathways
- Based in open standards supported by COTS tools
- Launched Sept 2019
- Endorsed by key industry supporters, including HIMSS, HL7, NCQA, AHRQ, Logica Health
- Operating under established not-for-profit industry trade consortium
Mission

Building a Community of Practice around sharable workflows/pathways

• BPM+ Health is a community initiative to:
  • improve the quality and consistency of healthcare delivery.
  • foster applied use of business process modeling standards
  • Advance the use of standards-based clinical best practices, care pathways and workflows directly at the point of care.

• The community comprises:
  • Healthcare provider organizations
  • Professional and Clinical Speciality Societies
  • Product vendors, platform vendors, and integrators
  • Medical Schools and Professional Education bodies
  • Government organizations
• Develop best practices around modeling and sharing clinical pathways, clinical guidelines, and other healthcare knowledge;

• Promote the use of open standards to produce knowledge assets that are useful, sharable, and effective
  • Based on the BPMN™, DMN™, and CMMN™ language formalisms
  • Supported by COTS tooling

• Cultivate a knowledge ecosystem advancing national and international health through unfettered sharing of best-practices

• Remove barriers to sharing knowledge, advancing the use and adoption of best-practices

• Seek collaboration with other standards developing organizations in the Healthcare industry.
Community Structure

The Value of Peer Collaboration

<table>
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<tr>
<th>Authoring</th>
<th>Institutional Adoption</th>
<th>Implementers</th>
<th>Methodology</th>
<th>Academic and Professional Education</th>
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<tbody>
<tr>
<td>• Focus on writing/distributing content</td>
<td>• Bringing pathways into institutional use</td>
<td>• Approaches for IT implementation (tooling and execution)</td>
<td>• Maintain expression formalisms</td>
<td>• Develop curriculum for accreditation</td>
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<tr>
<td>• Healthcare practice patterns</td>
<td>• Intersect between pathways, HIT, and human resources</td>
<td>• Ingesting and using externally sourced pathways</td>
<td>• Develop/maintain authoritative guidance; feedback to SDOs</td>
<td>• Workforce development</td>
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Institutional Adoption

• Approaches for IT implementation (tooling and execution)
• Ingesting and using externally sourced pathways

Implementers

• Maintain expression formalisms
• Develop/maintain authoritative guidance; feedback to SDOs

Methodology

• Develop curriculum for accreditation
• Workforce development
The State of the Community

- Running informally for over 3 years, officially launched in September 2019
- >30 Organizational Members
- Established ambassador program
- Assets, educational materials, and training on website
- Collaborative tooling and infrastructure underway
- Policies, governance, and elections in place by Sept 2020
The Big Finish: The “Art of the Possible”

- Simulation of guideline execution (assist in functional validation)
- Reduce or eliminate technical latency of new guideline adoption (computability)
- Enhanced authoring of “joint” guidelines crossing specialties
- Remediation of co-morbidities to determine conflicting guidance (red flags)
- Auto-reconciliation (or integration) of guidance
A Call to Action

- Utilize
  - Download the field guide or modeled pathways and conduct pilot activities
  - Develop workflows within your organization
  - Adopt content that is available (it is all standards based!)

- Get involved!
  - Limited barriers to participating
  - Five communities underway

- Nominate your activity for recognition
  - Joint award to be presented by HL7 and BPM+
  - Focus on patient impact

- Attend!
  - Working meetings quarterly in March/June/Sept/December
  - Visit http://bpm-plus.org
The Bottom Line

Interoperability is about more than data.
We need pilot projects from which to learn.
A knowledge ecosystem is essential.
We must move beyond "digital paper".
Community is essential to success.
THANK YOU!!!

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