EASI-PRO

EHR Access to Seamless Integration of PROMIS

Justin Starren, MD PhD FACMI
Deputy Director, NUCATS Institute
Director Center for Data Science and Informatics
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Patient-Reported Outcomes Measurement Information System (PROMIS)

Computer Adaptive Testing (CAT) Questionnaires

Start T-score=0.5

Compute Question with Maximum Information

Answer Question

Below

Check Variance Threshold

Recompute T-score and variance

Above

Done. Report Results
Early Integration of PROMIS with EHRs

• Use separate research-based PROMIS software
• Send message through EHR with link to Assessment Center
• Questionnaire responses returned via an HL7 lab results interface
  - Custom code within Assessment Center to generate and send HL7 message
  - Custom inbound interface to accept this message
  - Adds an additional point of failure to the process
NMPRO Goals
Northwestern Medicine Patient Reported Outcomes

**Consistent Patient Experience**
- Host CAT questionnaires within MyChart instead of opening in a separate browser window
- Display CAT questionnaires with the same look and feel of native Epic questionnaires
- Combine multiple PROMIS instruments into a single questionnaire

**Consistent Provider Experience**
- Create a new Epic encounter so providers can quickly identify questionnaire submissions
- Leverage standard Epic reports and graphs
- Take advantage of additional features of native Epic questionnaires (In Basket response routing, Best Practice Advisory triggers, etc.)
NMPRO Architecture

PROMIS Assessment Center API

NMPRO Middleware

App 2

NMH Framework

Communication
Logic
Data

Interconnect

Epic

myChart

NMH Research DB

NMPRO Table

5/31/2017
Method
Middleware Application – Questionnaire List

**Questionnaires**

**Personalized Questionnaires**

This list contains questionnaires that have been made available to you. Click a row to fill out a questionnaire.

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/16/2015</td>
<td>POST KNEE SURGERY SURVEY</td>
</tr>
</tbody>
</table>
Method

Middleware Application – Questionnaire Administration

POST KNEE SURGERY SURVEY

Please answer the following question and click the Continue button.

Does your health now limit you in doing two hours of physical labor?

- Not at all
- Very little
- Somewhat
- Quite a lot
- Cannot do

Continue >
ID Mapping Problem

**PROMIS Namespace**

- PROMIS Instrument #1
- PROMIS-ID

**EHR Namespace**

- Dummy Survey #1
- EHR-ID

**Question**

- Question
- Question
- Question
- Question
- Question
- Question
- Question
- Question
- Question
- Question
- Question
- Question

**PROMIS Namespace**

**EHR Namespace**
# Method

## Administrative Application – Form Data

<table>
<thead>
<tr>
<th>Name:</th>
<th>PROMIS BANK V1.2 - PHYSICAL FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epic Scoring Question ID:</td>
<td>External Application:</td>
</tr>
<tr>
<td>101789</td>
<td>ASSESSMENT CENTER</td>
</tr>
</tbody>
</table>

### Included Questions

<table>
<thead>
<tr>
<th>Question Name:</th>
<th>Epic Question ID:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOES YOUR HEALTH NOW LIMIT YOU IN DOING VIGOROUS ACTIVITIES, SUCH AS RUNNING, LIFTING HEAVY OBJECTS, PARTICIPATING</td>
<td>101664</td>
</tr>
<tr>
<td>DOES YOUR HEALTH NOW LIMIT YOU IN BENDING, KNEELING, OR STOOPING?</td>
<td>101665</td>
</tr>
<tr>
<td>DOES YOUR HEALTH NOW LIMIT YOU IN DOING HEAVY WORK AROUND THE HOUSE LIKE SCRUBBING FLOORS, OR LIFTING OR MOVING</td>
<td>101666</td>
</tr>
</tbody>
</table>
Method

Administrative Application – Question Data

Name:

DOES YOUR HEALTH NOW LIMIT YOU IN BENDING, KNEELING, OR STOOPING?

Epic Question ID: 101665
External Application: ASSESSMENT CENTER
External Question ID: DBE887A2-2EC3-435E-9C03-CE6E99E1985B
Assembling Orderable Surveys

- **PROMIS Instrument #1**
  - Orderable Survey #1
  - Question
  - Question
  - Question
  - Question
  - Question
  - Question
  - Question
  - Question
  - Question
  - Question

- **PROMIS Instrument #2**
  - Orderable Survey #2
  - Question
  - Question
  - Question
  - Question
  - Question
  - Question
  - Question
  - Question
  - Question

- **Back Pain**
  - Pain Interference
  - Question

- **Joint Replacement**
  - Physical Function
  - Question

- **Depression**
Method

Administrative Application – Survey Data

Name: TOTAL KNEE ARTHROPLASTY
Display Name: POST KNEE SURGERY SURVEY

Epic Survey ID: 10004000
External Application: ASSESSMENT CENTER
External Survey ID: 

Included Forms

Available Forms

Search available forms

NEURO-QOL BANK V1.0 - ABILITY TO PART. IN SRA
NEURO-QOL BANK V1.0 - STIGMA
PROMIS BANK V1.0 - ANXIETY

Selected Forms (drag and drop below to select and order)

PROMIS BANK V1.2 - PHYSICAL FUNCTION
PROMIS BANK V1.1 - PAIN INTERFERENCE
PROMIS SCALE V1.0 - PAIN INTENSITY 3A
PROMIS BANK V2.0 - ABILITY TO PARTICIPATE SOCIAL
Method
Clinical Application - Ordering

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Method
Clinical Application - Ordering

<table>
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<tbody>
<tr>
<td>PROMIS BANK V1.2-PHYSICAL FUNCTION FINAL SCORE</td>
<td>10-90</td>
<td>37.1</td>
<td>40.1</td>
<td>48.7</td>
<td>54.7</td>
</tr>
<tr>
<td>PROMIS BANK V2.0-ABILITY TO PARTICIPATE IN SOCIAL ROLES AND ACTIVITIES FINAL SCORE</td>
<td>10-90</td>
<td>38.5</td>
<td>45.6</td>
<td>49.5</td>
<td>56.2</td>
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<tr>
<td>PROMIS SCALE V1.0-PAIN INTENSITY 3A FINAL SCORE</td>
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<td>53.7</td>
<td>53.7</td>
<td>43.8</td>
<td>35.8</td>
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<tr>
<td>PROMIS BANK V1.1-PAIN INTERFERENCE FINAL SCORE</td>
<td>10-90</td>
<td>64.2</td>
<td>61.6</td>
<td>58.7</td>
<td>48.7</td>
</tr>
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</table>
## Method

**Clinical Application - Ordering**

### Total Knee Arthroplasty

<table>
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EASI-PRO U01 Plans

- **Aim 1.** Create scalable implementations for Epic and Cerner
- **Aim 2.** Create SMART-on-FHIR implementation
- **Aim 3.** Implement CTSA sites both within and outside of the project team CTSA sites.
- **Aim 4.** Evaluate
EASI-PRO Project Structure

Nine Sites

- Northwestern*
- University of Chicago
- University of Illinois at Chicago
- University of Alabama at Birmingham*
- University of Kentucky
- University of Florida
- University of Utah
- Harvard Catalyst CTS*
- Southern California CTSI*

Three Integrations

- Epic
- Cerner
- Smart-on-FHIR
4 Year Project

- PRO Resource Development
- Software Development
- Implementation at Project Sites
- Evaluation
- Implementation at other CTSA sites.

Year 1

Year 2

Year 3

Year 4
EASI-PRO Status: Epic

• Module release May 2017
• Compatible with Epic 2016/17 release
• Eight Instruments
• Local Additions Possible
• Session at UGM 2018

• PROMIS CAT v2.0 - Upper Extremity Function
• PROMIS CAT v2.0 - Ability to Participate Social Roles & Activities
• PROMIS CAT v1.0 - Anxiety
• PROMIS CAT v1.0 - Sleep Disturbance
• PROMIS CAT v1.1 - Pain Interference
• PROMIS CAT v2.0 - Physical Function
• PROMIS CAT v1.0 - Depression
• PROMIS CAT v1.0 – Fatigue
PROMIS® Computer Adaptive Testing
EASI-PRO Status: Cerner & Smart-on-FHIR

• Cerner
  - Architecture Designed
  - Development Beginning

• Smart-on-FHIR
  - Early Architectural Discussions
  - Dependent on Write Profiles
Lessons Learned

• Integrating with EHRs is hard
  - Managing event triggers is critical
  - Understand your workflow
• Patient Portal uptake low
• Waiting-room is critical time
  - Need waiting-room version
  - Tablets!
• Why are you doing this?
Clinical data vs Research

Clinical Data

Research Data

“Normal” clinical data used for research

Clinically useful data, but the collection or structure is driven by research needs.
We’d now like to open the floor to shorter speeches disguised as questions.
Thank You

Justin Starren  justin.starren@northwestern.edu