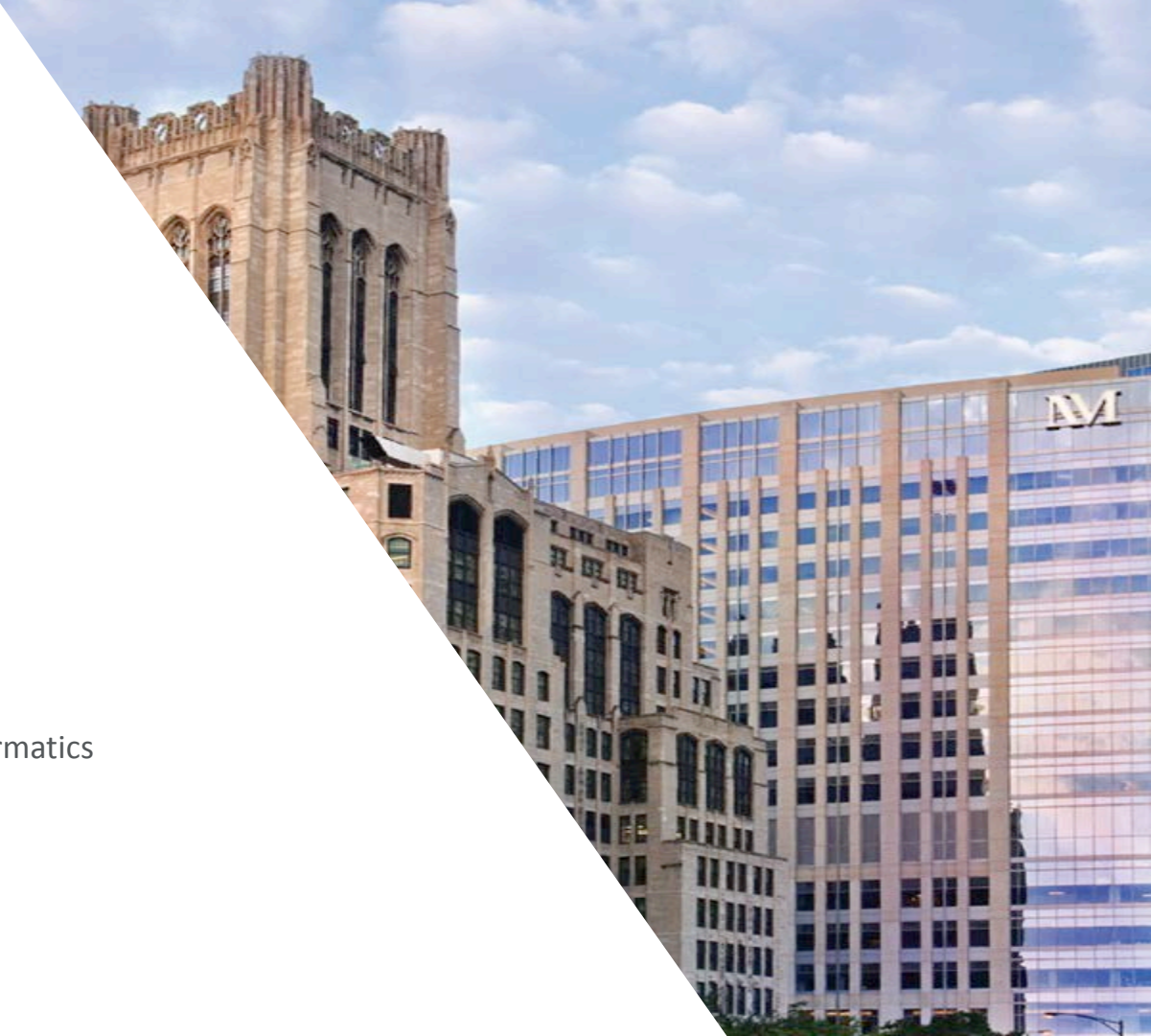


EASI-PRO

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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NU NMPRO

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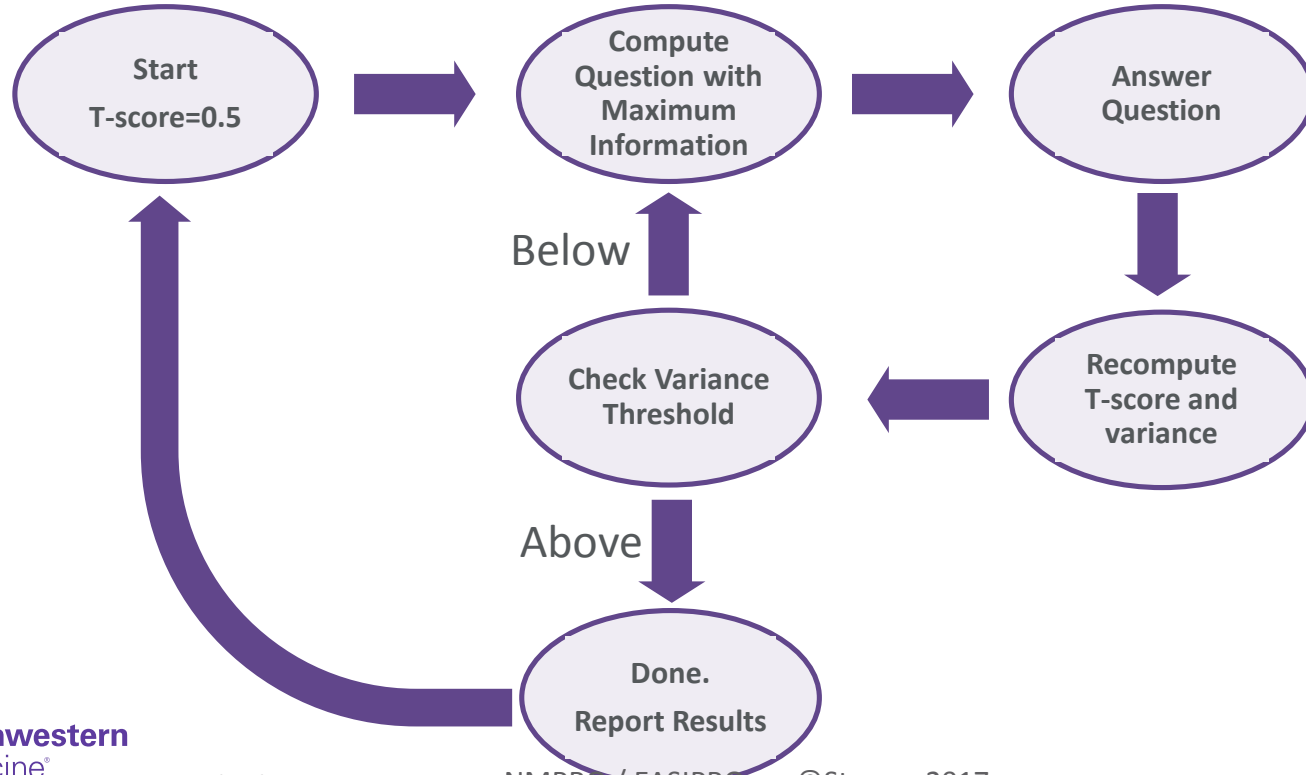
EASI-PRO

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No Disclosures

Patient-Reported Outcomes Measurement Information System (PROMIS)

Computer Adaptive Testing (CAT) Questionnaires



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

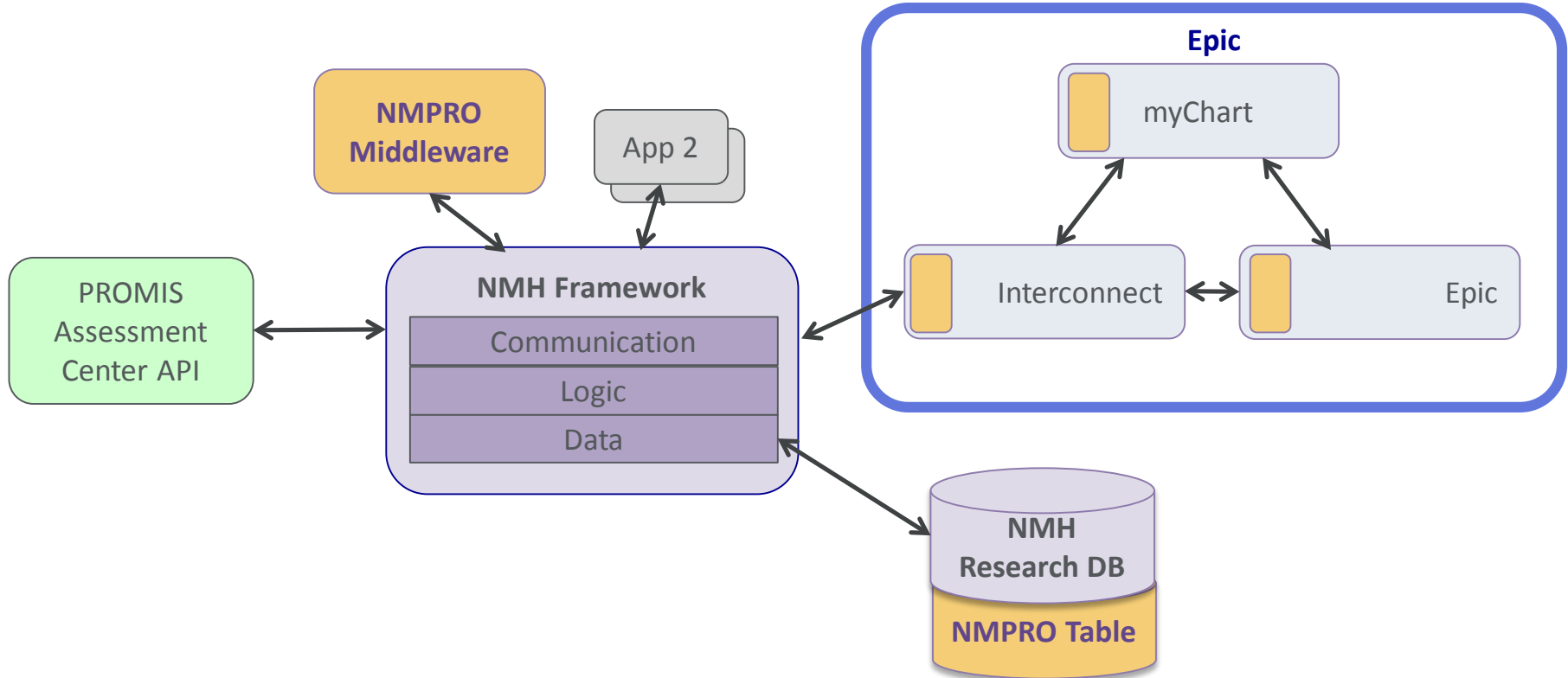
Consistent Patient Experience

- 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



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.

Due Date	Questionnaire
<input type="radio"/> 04/16/2015	POST KNEE SURGERY SURVEY

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

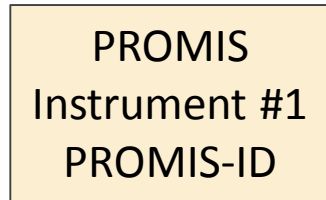
Quite a lot

Cannot do

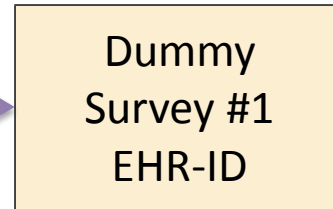
[Continue >](#)

ID Mapping Problem

PROMIS Namespace



EHR Namespace



Method

Administrative Application – Form Data

Name:

PROMIS BANK V1.2 - PHYSICAL FUNCTION

Epic Scoring Question ID:

101789

External Application:

ASSESSMENT CENTER

External Form ID:

56296D2D-C919-40F1-AFC7-6F544FCA7772

Included Questions

Question Name:

DOES YOUR HEALTH NOW LIMIT YOU IN DOING VIGOROUS ACTIVITIES, SUCH AS RUNNING, LIFTING HEAVY OBJECTS, PARTICIPATING IN SPORTS, OR OTHER RECREATIONAL ACTIVITIES?

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

DOES YOUR HEALTH NOW LIMIT YOU IN DOING HEAVY WORK AROUND THE HOUSE LIKE SCRUBBING FLOORS, OR LIFTING OR MOVING HEAVY OBJECTS?

Epic Question ID:

101664

101665

101666

Method

Administrative Application – Question Data

Name:

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

Epic Question ID:

101665

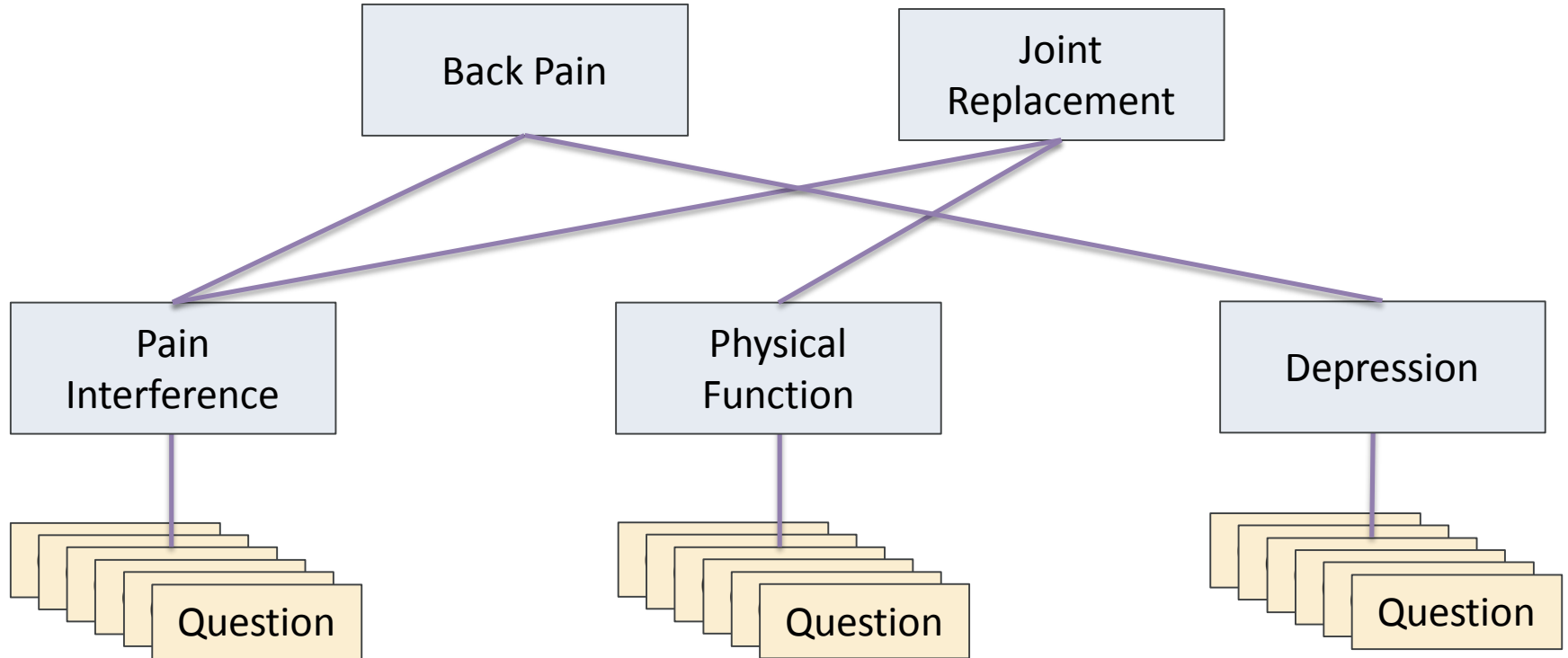
External Application:

ASSESSMENT CENTER

External Question ID:

DBE887A2-2EC3-435E-9C03-CE6E99E1985B

Assembling Orderable Surveys



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

Rx/Tests/Other Orders Procedures (1 Order)

QUESTIONNAIRE OR QUESTIONNAIRE SERIES ✓ Accept ✗ Cancel Remove

Routine, Normal, Qty-1

Questionnaire 

Series:

Class:

Recent

▶ Additional Order

✓ Accept ✗ Cancel Remove

F7- Prev Order F8- Next Order

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Method

Clinical Application - Ordering

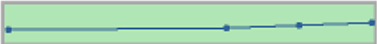
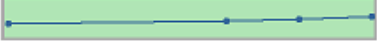
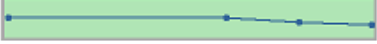
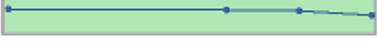
Total Knee Arthroplasty

	Range	12/3/2015	2/6/2015	3/7/2015	4/8/2015
PROMIS BANK V1.2-PHYSICAL FUNCTION FINAL SCORE	10-90	37.1	40.1	48.7	54.7
PROMIS BANK V2.0-ABILITY TO PARTICIPATE IN SOCIAL ROLES AND ACTIVITIES FINAL SCORE	10-90	38.5	45.6	49.5	56.2
PROMIS SCALE V1.0-PAIN INTENSITY 3A FINAL SCORE	10-90	53.7	53.7	43.8	35.8
PROMIS BANK V1.1-PAIN INTERFERENCE FINAL SCORE	10-90	64.2	61.6	58.7	48.7

Method

Clinical Application - Ordering

Total Knee Arthroplasty

	Range	Previous	Last 2 scores	Latest	12/3/2014-4/8/2015
PROMIS BANK V1.2-PHYSICAL FUNCTION FINAL SCORE	10-90	48.7		54.7	
PROMIS BANK V2.0-ABILITY TO PARTICIPATE IN SOCIAL ROLES AND ACTIVITIES FINAL SCORE	10-90	49.5		56.2	
PROMIS SCALE V1.0-PAIN INTENSITY 3A FINAL SCORE	10-90	43.8		35.8	
PROMIS BANK V1.1-PAIN INTERFERENCE FINAL SCORE	10-90	58.7		48.7	

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

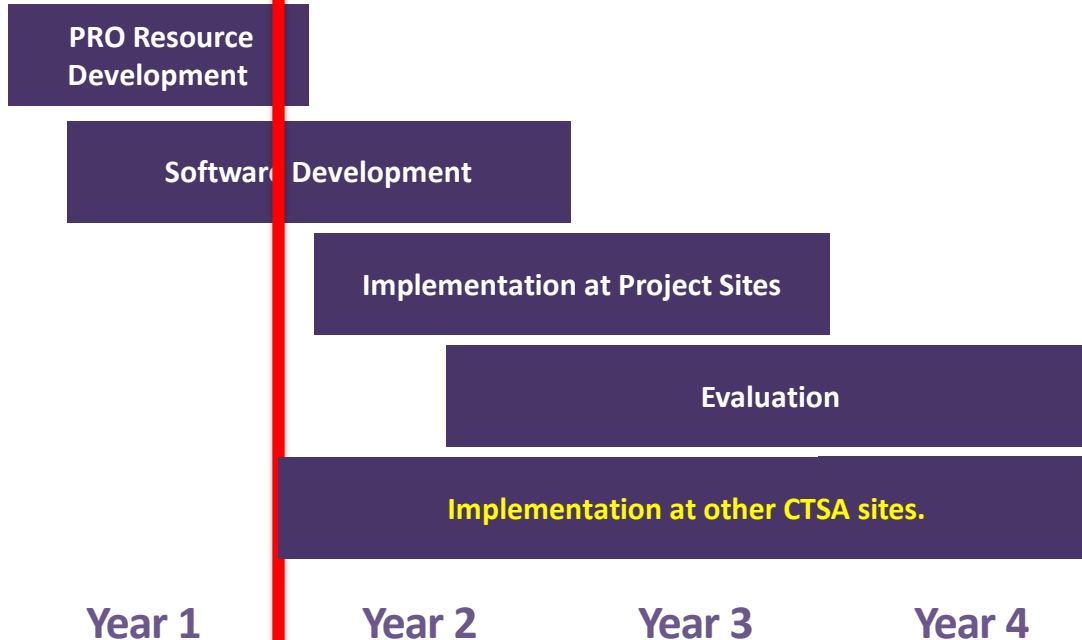
Nine Sites

- 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



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 Questionnaire

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

CANCEL

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PROMIS[®] Computer **A**daptive **T**esting

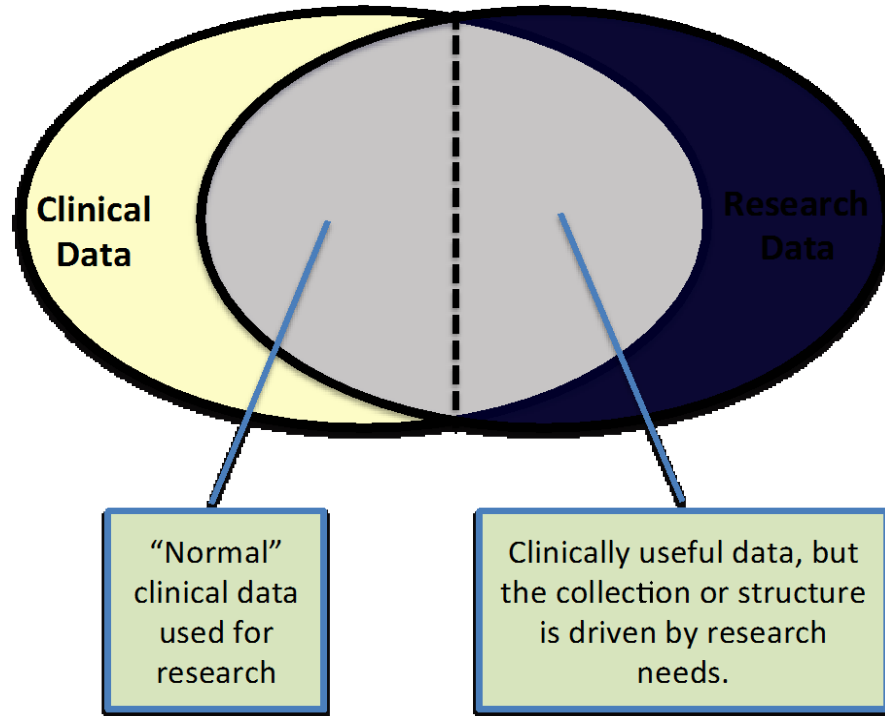
EASI-PRO Status: Cerner & Smart-on-FHIR

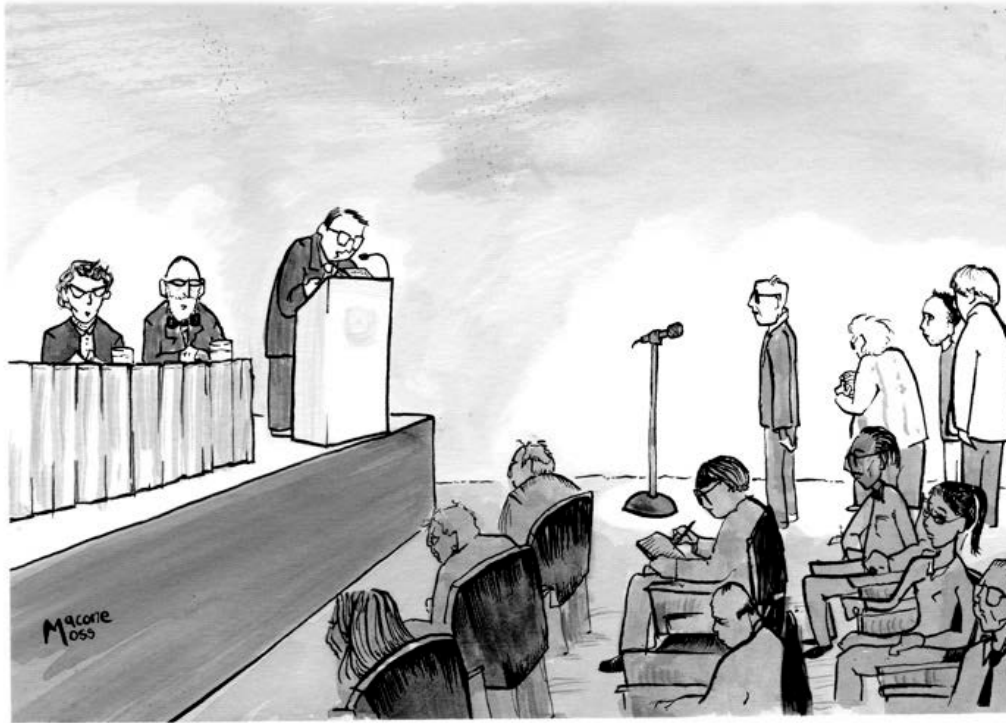
- Cerner
 - Architecture Designed
 - Development Beginning
- Smart-on-FHIR
 - Early Architectural Discussions
 - Dependent on Write Profiles

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





We'd now like to open the floor to shorter speeches disguised as questions.

Thank You

Justin Starren

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