CDSC Services Integration at UMDNJ in the GE Centricity EMR

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AHRQ Technical Expert Panel
May 29, 2012

GE Healthcare

UMDNJ
The Robert Wood Johnson Medical Group
Robert Wood Johnson Medical School

CDS consortium

Robert Wood Johnson Medical Group (RWJMG)

- Faculty practice of the UMDNJ Robert Wood Johnson Medical School
- Located in Central New Jersey
- 500 physicians; 300 ambulatory providers
- 16 clinical departments
- 42 distinct specialty practices
- 8 clinical institutes
- 20 affiliated hospitals
- 243,300 annual ambulatory visits in 2010

History of RWJMG GE Centricity Implementation

- 1995 – Clinicalogic installed at NJMS – Newark, Department of Medicine
- 2000 – Logician implementation extended to all of UMDNJ (3 medical schools)
  - Implementation at RWJMG incomplete (5 practices)
- 2007 – RWJMG contracted independently with GE for hosted Centricity EMR
  - Rollout of EMR extended to entire RWJMG group (42 practices)
  - All practices implemented by 12/31/2010
- 2011 – successful achievement and attestation for ARRA Meaningful Use EHR incentive program

UMDNJ's involvement with CDSC

- July, 2008 – invited to participate in CDSC in 3 areas:
  - Demonstration site for CDSC using the GE Centricity EMR.
  - Participation in the KTS (Knowledge Translation and Specification Team)
  - Participation in Content Governance Committee
- July, 2011 - CDSC vendor site collaboration begun as activity of Optional Year 2 of CDSC

Initial Expectations

- This would serve as an impetus to general adoption of clinical decision support throughout the RWJMG practice
- Formal knowledge life-cycle management
- CDSC would prompt the vendor to adopt a standardized approach to clinical decision support
- CDSC would prompt the vendor to build services integration into the Centricity EMR.

Challenges

- Social
- Technical
- Resource/Financial
- Legal

Challenges: Social

- Relatively new EMR implementation
- CDS not part of culture or expectation at UMDNJ
- History of practices operating independently – even within the EMR
- Varying expectations and receptivity to CDS
- Competing priorities – Meaningful Use
- Vendor vision

Challenges: Technical

- GE Centricity EMR is an old platform – CDS hasn't changed much over the past decade
- Centricity relies on 3rd party add-ins for CDS
- Database does not use standard data vocabulary for many observations
- No built-in mechanism for transmitting data to an external service
- CDS is ad hoc without a standard structure for decision rules.
- CDS is not modular – decision logic is scattered throughout various components of the application.

Clinical Decision Support in the GE Centricity EMR

- Protocol reminders
  - Very general
  - Not actionable
- Rules attached to structured assessments
  - Uses third-party product
    - limits flexibility
    - idiosyncratic implementation
  - Recommendations are actionable
  - Must be maintained manually
- Custom forms
  - Most flexible
  - Non-modular - most difficult to maintain
  - Can be actionable

Example of protocols

Assessment/Plan: Walter S. Caldwell

Assessment

Assess or Update Problems

Status of Existing Problems

New Problems

additional workup planned

Preventive Care Reminders

include preventive care reminders in note

HEMOCCULT or SIGMOID, FLU VAX, PNEUMOVAX, TD BOOSTER.

Plan

Enter Medications

Enter Orders

New Prescriptions/Refills

Updated Medication List

MEVACOR TAB 40MG (LOVASTATIN) 1 po qd
ATENOLOL TABS 25 MG (ATENOLOL) 1 po qd
PLAVIX 75 MG TABS (CLOPIDOGREL BISULFATE) 1 po QD

New Orders

Disp

Prev Form (Ctrl

Preventive Care Reminders

include preventive care reminders in note

HEMOCCULT or SIGMOID, FLU VAX, PNEUMOVAX, TD BOOSTER.

Example of CCC decision rule

CPOE A&P-CCC: Sarah S. Oberheim

A&P 1-2 | A&P 3-4 | A&P 5-6 | A&P 7-8 | A&P 9-10 | A&P 11-12

Select Specialty: Family Practice

Assessment # 1 — Select problem; enter assessment, orders, and meds; then click 'Commit Assessment' — Prob List

DIABETES MELLITUS, INSULIN DEPENDENT (IDDM) (ICD-250.01) — View/Insert Prior — Commit Assessment — Clear All

Centricity

The patient has diabetes and is currently not on an ACE-I or ARB. If the patient has coexisting hypertension or renal disease, consider starting an ACE-I or ARB as long as there are no contraindications. Click 'Yes' to add a medication; otherwise, click 'No'.

Yes | No

Assessment # 2 — Clear All

ccc_Adult_PSIA_Tx_def_Exec("Diabetes Mellitus^ICD-250^not^1,8^ACEcontra^The patient has diabetes and is currently not on an ACE-I or ARB. If the patient has coexisting hypertension or renal disease, consider starting an ACE-I or ARB as long as there are no contraindications. Click 'Yes' to add a medication; otherwise, click 'No'.^CCC-ACE-I^Would you like to document a contraindication to ACE-I/ARB ?^EF")

CDS approach to Meaningful Use

Registration & Clinical Staff

- Language, race, ethnicity
- Active Medication List
- Active Allergy List
- Vital Signs
- Smoking history
- Immunization history

Providers

- Problem List
- Medication Reconciliation
- Documenting counseling
  - Smoking
  - Weight and nutrition.
- E-prescribing
- Computer order entry
- Completing patient instructions

Automatic or handled by EMR staff

- Provide patients with electronic copy of health information
- Provide electronic summary of care record
- Drug-formulary checks
- Drug-drug and drug-allergy interactions
- Decision support rule
- Exchange data with other providers
- HIPAA protection of health information
- Lab results in EMR as structured data
- Generate lists of patients for QI or research

Example of custom form

Med-Allergy Review: Walter S. Caldwell

Medications | Current Medications

Medication-Allergy Review

Medications following this update:

MEVACOR TAB 40MG (LOVASTATIN) 1 po qd
NITROSTAT SUB 0.4MG (NITROGLYCERIN) 1 sl prn c/p, max of 3 in 15 min

Removed Medications:

Update Medications

- Medications reviewed by staff
- Medications Reviewed by Provider
- Include prior Medications in note

Current Medication Allergies:

PERCOCET (Critical)

Update Med Allergies

- Med allergies reviewed by staff
- Med allergies reviewed by provider

Return to MU Checklist

Form Rebuilt by Robert Wood Johnson Medical Group Clinical Content Team

Prev Form (Ctrl+PgUp) | Next Form (Ctrl+PgDn) | Close

Vital Signs-2-CCC: Walter S. Caldwell

Vital Signs | Pain/Fatigue | Vision/Hearing | Resp/Card | Menstrual Hx | POC Labs

Vital Signs: Chief Complaint (Reason for Visit):

VS View: Standard / Metric — Convert to Metric — VS Entered By =>

Standard		Previous Values	Metric		Previous Values
Height: 68	inches	74 (04/05/2001)	Height:	cm	
Weight: 240 lb	oz 240 lb	275 (10/19/2011)	Weight:	kg	
Pt. refused wt: ☐	BMI not applicable: ☐				
Waist:	inches		Waist:	cm	
Temp:	deg. F.	98.6 (10/10/2001)	Temp:	deg. C.	
Temp Site:		oral (04/05/2001)			

Resp:	per min.	14 (10/10/2001)	BP sitting: /	Site:	120/70 (10/19/2011)
O2 Sat:	%	95 (10/15/2001)	BP supine: /	Site:	
Pulse:	per min.	78 (10/19/2011)	BP stand: /	Site:	
Pulse (Ortho)	per min.			Cuff size:	
Rhythm:					

Load Serial Assessments Form

Ht conversion table | Cal %

Body Mass Index (kg/m2): 37

The patient was given a follow-up plan for weight reduction. ☐

Body Surface Area (m2): 2.21 ☑ Add BSA to chart

Optimal body weight range: 144 to 197 lb.

Optimal BMI range: 22 to 29 kg/m2 based on age >65 yr.

Previous smoking status: current (on 10/19/2011)

Tobacco use: current every day smoker

Year started:

☐ cigarettes — Amt: packs/day

☐ cigars — Amt: # per week

☐ smokeless/chewing — Amt: per day

Counseled to quit/cut down: ○ yes ○ no

Comments:

This patient is over age 50. Please document most recent influenza vaccine.

Patient asked about previous influenza vaccine: ☐

Date last recorded: 0.5 ml given 03/02/2000

This patient is over age 65. Please document most recent pneumovax.

Patient was asked about pneumococcal vaccination: ☐

Date last recorded: 0.5 ml given 03/02/2000

Load Immunization Form

Update Meds_Allergies | Update Directives | Update Prob List | Return to MU Checklist

HPI | ACV | PMH | FH-SH | Risk Factors | ROS | VS | PE | Problems | CPOE A/P | Instructions/Plan

Prev Form (Ctrl+PgUp) | Next Form (Ctrl+PgDn) | Close

Height: 68 inches 74 (04/05/2001)
Weight: 240 lb oz 240 lb 275 (10/19/2011)
Pt. refused wt: BMI not applicable:
Waist: inches
Temp: deg. F. 98.6 (10/10/2001)
Temp Site: oral (04/05/2001)
Resp: per min. 14 (10/10/2001) BP sitting:
O2 Sat: % 95 (10/15/2001) BP supine
Pulse: per min. 78 (10/19/2011) BP stand:
Pulse (Ortho) per min.
Rhythm:
Ht conversion table
Body Mass Index (kg/m2): 37
The patient was given a follow-up plan for weight reduction.
Optimal body weight range: 144 to 197 lb.

OBSNOW("BMI CLASSIF")<>"T" AND (((OBSNOW("BMI")>=30) and (patient._ageinmonths >= 780)) or ((OBSNOW("BMI")>=25) and ((patient._ageinmonths < 780) and (patient._ageinmonths > 216))))

Print Preview

100 Two Page Pg: 1

Weight and Nutrition:

You are overweight based on your weight of 240 lb and your body mass index (BMI) of 37 kg/m2. Your optimal BMI range is 22 to 29 kg/m2 based on age >65 yr.Your optimal weight range is 144 to 197 lb. There are several resources available to help you lose weight. These include:

1) Weight Watchers: You can get more information at their web site: www.weightwatchers.com. -

2) Aim for a Healthy Weight page at the National Heart, Lung and Blood Institute: http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/index.htm

MU Checklist: Walter S. Caldwell

Meaningful Use Checklist

Provider Items

Active Problem List	Problem list has at least 1 entry.	Update Prob List
CPOE	No Rx written this update.	(Advisory Only)
E-prescribing	No Rx written this update.	(Advisory Only)
Med list reviewed by provider	Not reviewed this update.	Med-Allergy Review Form
Allergies reviewed by provider	Not reviewed this update.	Med-Allergy Review Form
Weight Advice	Patient overweight; wt. advice not given.	Vital Signs Form
Smoking Advice	Smoker, not advised to quit.	Vital Signs Form
Patient Instructions Printed	Patient instructions were printed.	Patient Instructions Form

Clinical Staff Items

Active Medication List	Med list has at least 1 item	Update Med List
Active Allergy List	Allergy list has at least 1 item.	Update Allergy List

Height:	74	in	Height recorded.	Vital Signs Form
Weight:	265	lb	Weight recorded.	Vital Signs Form
BMI:	34.15	kg/m2	BMI requires height and weight.	(Automatically calculated)
Systolic BP		mm Hg	Systolic BP not recorded.	Vital Signs Form
Diastolic BP		mm Hg	Diastolic BP not recorded.	Vital Signs Form

Smoking status	Recorded: current	Vital Signs Form
Pneumovax History	Pneumovax documented.	Adult Immunizations
Influenza Vaccine History	Flu vaccine documented.	Adult Immunizations

Prev Form (Ctrl+PgUp) | Next Form (Ctrl+PgDn) | Close

MU Checklist: Jennifer L. Cray

MU Checklist | PQRS Checklist

Meaningful Use Checklist

Provider Items

Active Problem List	Problem list has at least 1 entry.	Update Prob List
CPOE	No Rx written this update.	(Advisory Only)
E-prescribing	No Rx written this update.	(Advisory Only)
Allergies reviewed by provider	Allergies reviewed this update.	Med-Allergy Review Form
Nutritional Advice	Patient underweight; nutrition advice given.	Vital Signs Form
Smoking Advice	Smoker, advised to quit.	Vital Signs Form
Patient Instructions Printed	Patient instructions were printed.	Patient Instructions Form

Clinical Staff Items

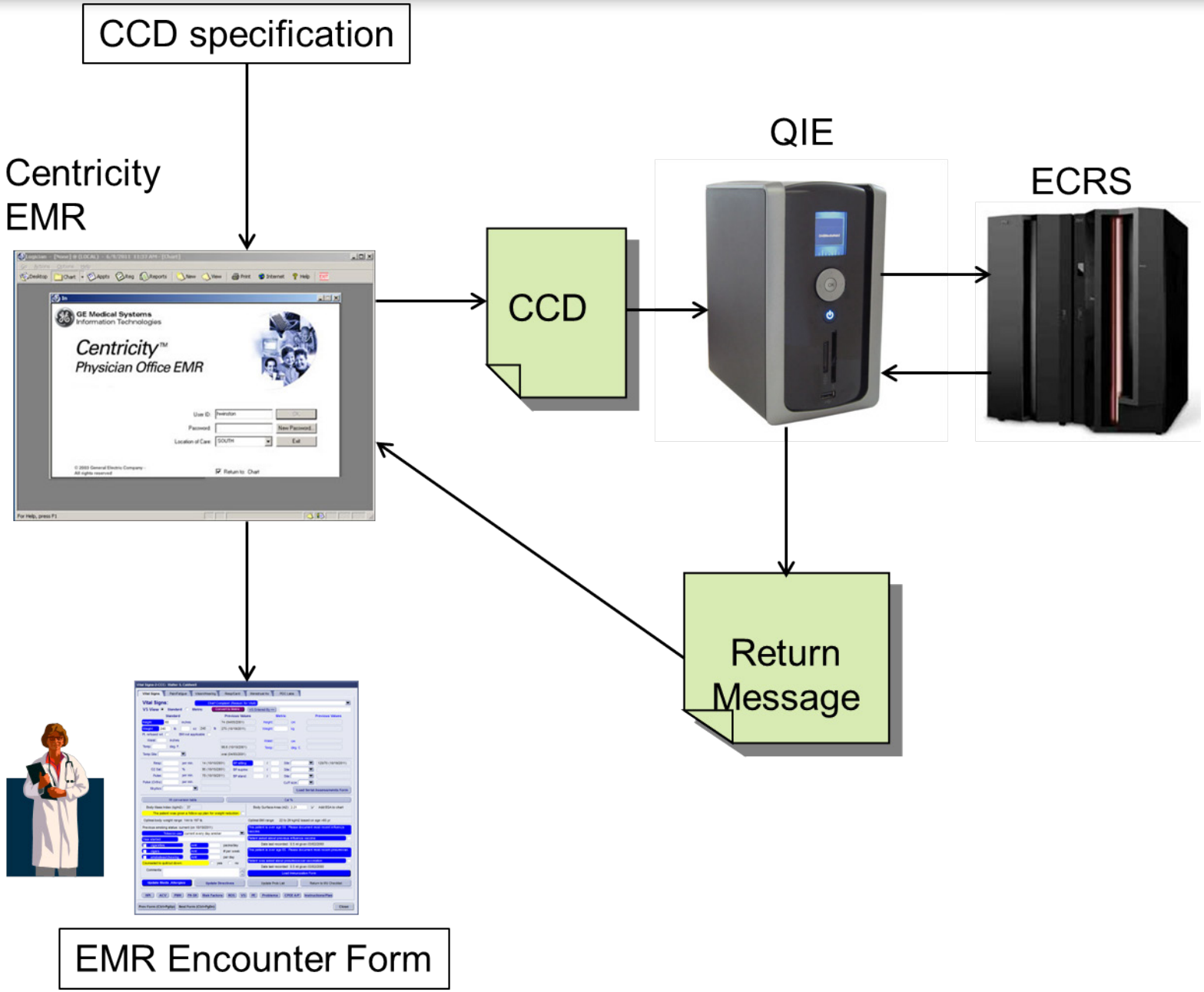
Active Medication List	'No Known Meds' documented.	Update Med List
Active Allergy List	'NKA' documented this update.	Update Allergy List

Height:	65	in	Height recorded.	Vital Signs Form
Weight:	80	lb	Weight recorded.	Vital Signs Form
BMI:	13.36	kg/m2	BMI requires height and weight.	(Automatically calculated)
Systolic BP	110	mm Hg	Systolic BP recorded.	Vital Signs Form
Diastolic BP	70	mm Hg	Diastolic BP recorded.	Vital Signs Form
Smoking status			Recorded: current	Vital Signs Form

Prev Form (Ctrl+PgUp) | Next Form (Ctrl+PgDn) | Close

Technical approach

- Generation of CCD containing correct vocabulary encoding
- Use of 3rd party product – Qvera Interface Engine (QIE) to add correct encoding of terms and transmission to ECRS via web service.
- Use of QIE to receive advice from ECRS
- Encounter form to display advice and provide action mechanism.


CCD specification
Centricity EMR
GE Medical Systems Information Technologies
Centricity™ Physician Office EMR
CCD
QIE
ECRS
Return Message
EMR Encounter Form

Challenges: Resource/Financial

- Initially, vendor was not engaged – services integration delayed for 2 years
- Vendor (GE) is fully occupied with Meaningful Use
- Customer (UMDNJ) is fully occupied with Meaningful Use
- Unacceptable for research to delay production activities for business operations

Challenges: Legal

- UMDNJ Legal department understaffed – legal review takes a long time.
- UMDNJ has blanket objection to indemnity waivers.

Lessons Learned

- Early engagement between CDSC and vendor
- Identify a vendor champion who will own the project
- Close coordination with customer implementation team to plan implementation and avoid surprises
- Frequent meetings between vendor and customer team to move implementation forward
- Persuade vendors to
  - Adopt standardized vocabulary
  - Build in mechanisms to communicate with external decision support services

Follow-up on Initial Expectations

- Overestimated vendor enthusiasm for the project and commitment of resources
- Vendor embracing this new paradigm for decision support has not (yet) occurred.
- Project as stimulus for more formal and rigorous approach to decision support in my practice has been realized.