

Building a Practical Data Quality Management Solution

ABSTRACT

This presentation will describe the components of an approach to identifying and resolving the "bad data" problems that inevitably emerge as hospitals strive to become capable of implementing data driven patient care performance improvement initiatives. Incomplete or inaccurate data can compromise any attempt to motivate clinicians to modify patterns of care as higher levels of quality and efficiency are sought. Hospital leaders need to be certain that the measures they use to manage clinical quality improvement are based upon reliable data. Inaccurate data sent by hospitals to external agencies for benchmarking purposes can seriously compromise the validity of such efforts. Analyzing the business processes behind "data supply chains" provides a starting point to understanding how to identify and fix the root causes of these problems. The Cedars-Sinai team will share the practical approach they have developed to identifying and prioritizing data quality problems for resolution, and then applying the methods and tools of performance improvement to fix them. Presenters will discuss building a data quality culture, implementing a systematic approach to data quality incident reporting and resolution, developing the clinical statistical information initiative to proactively approve data prior to external submission, and the evolution of a data quality dashboard for electronic health record implementation.

BIOGRAPHY

Bruce N. Davidson

Director of Resource and Outcomes Management
Cedars-Sinai Health System



Bruce N. Davidson, Ph.D., M.P.H. is Director of Resource and Outcomes Management for Cedars-Sinai Health System, a position he's held since 1996. He leads a department of 23 in the development and implementation of initiatives to promote cost-effective, high quality medical care. He is also an Adjunct Assistant Professor in the Health Services Department at the UCLA School of Public Health, teaching Quality Improvement and Informatics for the Executive Masters Program. Dr. Davidson has 30 years of hands-on experience in leading, supporting, and evaluating patient care process improvement initiatives, as well as the delivery of patient care services in both inpatient and outpatient settings. He has published in the areas of medical treatment effectiveness, decision-making in health care, and measurement for quality improvement, with a recent focus on information management. His PhD in Health Services Research and his Masters in Public Health are from UCLA and his Bachelors is from MIT.

Alein T. Chun

Manager of the Data Quality Measurement Unit
Cedars-Sinai Health System



Alein T. Chun, Ph.D., M.S.P.H. is the Manager of the Data Quality Management Unit (DQMU) at Cedars-Sinai Health System. He is responsible for the day-to-day operation of the enterprise DQM function. He and his staff of four manage an assortment of activities related to both internal reporting and the release of clinical and administrative data to outside organizations. Essential data quality control activities include creating standard operating procedures for managing high priority data elements, solving critical data problems, validating key data and reports, and assuring quality of data released to outside entities. DQMU also acts as facilitator and change agent in business process improvement across the data supply chain business units. Dr. Chun holds a Ph.D. in Health Services and a Master's degree in Public Health both from UCLA.

Ann Chu

Team Lead, Data Quality Management Unit
Cedars-Sinai Health System



Ann Chu, M.H.A. is the Team Lead of the Data Quality Management Unit (DQMU) at Cedars-Sinai Health System. She works together with her team of analysts and programmers in activities related to improving data quality in the organization. Such activities include managing and resolving data quality incidents, validating major database enhancements and fixes, validating key reports that are submitted to outside agencies, educating users on data quality and the correct use of data, and improving data and reports through process improvement initiatives. Ann has 10 years of experience in IT and data quality management. She holds a Master's degree in Health Administration from the University of Southern California.

Thai Lam

Senior Analyst
Data Quality Management Unit
Cedars-Sinai Medical Center



Thai Lam is currently a Senior Analyst in the Data Quality Management Unit at Cedars-Sinai Medical Center, where he has worked since 1998. He has worked in both business and IT roles focusing on data quality management, business intelligence, reporting, and financial modeling.

Cedars-Sinai

Building a Practical Data Quality Management Solution for an Academic Medical Center

Bruce Davidson, PhD, MPH, Director
Alein Chun, PhD, MSPH, Manager
Ann Chu, MHA, Team Lead
Thai Lam, Senior Analyst

Data Quality Management Unit,
Resource & Outcomes Management
July 13, 2011

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The Context

Cedars-Sinai Medical Center

- Academic Medical Center/Health System
- Largest Non-Profit Hospital in the Western US
- 958 Beds, 10,000 Employees, 2100 MDs
- Basic Annual Statistics
 - 57,000 inpatients
 - 565,000 outpatients
 - 82,000 ER visits
 - 7,000 deliveries



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Context: Academic Medical Center Data Management Implications

- Complex, data-intensive organization
- Distributed oversight responsibilities
- Transactional data systems populated as byproduct of patient care
- Data managed as departmental resource rather than as enterprise resource



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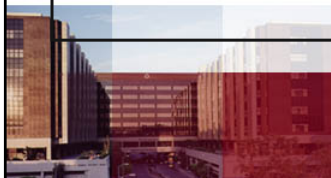
Resources Available to Carry Out Mission

MISSION

- Patient care
- Teaching
- Research
- Community Service

RESOURCES

- People
- Money
- Equipment
- Data





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Patient Care, Controlling Costs & Quality Improvement ALL depend on DATA

DATA QUALITY MANAGEMENT

Putting in place the management functions that will proactively assure the availability of data that meets user-defined standards of completeness, accuracy, timeliness, and accessibility



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The Road to Data Quality

- Adopt a customer/consumer perspective
 - High quality data = data that is fit for use
- Manage data as a product
 - Understand the consumer's data needs
 - Manage data as the product of a well-defined production process
- Define Data Quality beyond accuracy
- Adopt and adapt classical PI/QI principles



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Our Road to Data Quality at Cedar-Sinai

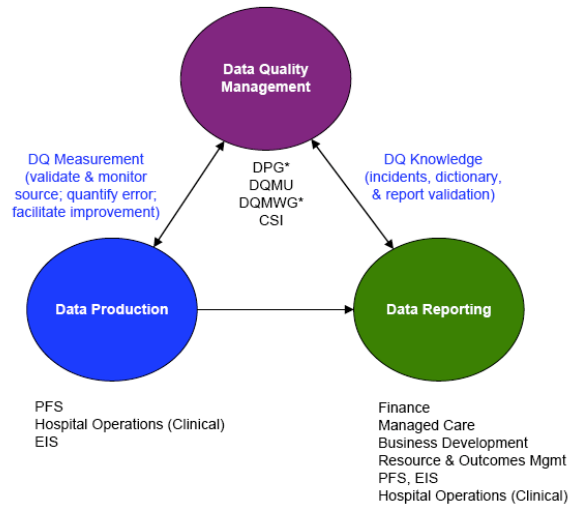
- 1997 - DPG convened by CEO
- 1998 - DQM WG started by DPG with ROM as Chair; IQ Survey #1
- 1999 - DQM Objectives in Annual Plan; IQ Survey #2
- 2000 - DQM Objectives in Annual Plan; OSHPD Submission DQ Improvement Project
- 2001 - DQM Objectives in Annual Plan; DPG & DQM WG Charters renewed; IQ Survey #3
- 2002 - CEO designates ROM as "clearinghouse" to approve all clinical statistics reported out of CSMC
- 2003 - DPG initiates Data Warehouse Improvement Project (DWIP) following no P&Ls for 8 months
- 2004 - DPG funds DQMU in ROM, DWIP implemented; IQ Survey #4
- 2005 - DWIP Objectives in Annual Plan; DQMU staffed and DQM Program formalized; DQ Incident Reporting & Resolution framework established
- 2006 - DQM Objectives in Annual Plan & linked to executive incentive compensation; High Priority Data Element Certification Program initiated
- 2007 - Internal Audit initiates focus on minimizing risk due to defective data; DPG sets "Task Force" model to resolve specific DQ issues, IQ Survey #5
- 2008 - DPG & IA direct DQMU to lead Clinical Statistical Information initiative
- 2009 - 2011 - 438 DQ Incidents logged as of May 2011 of which 401 have been closed; CS Link Implementation presents new challenges



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Data Quality Management Business Model

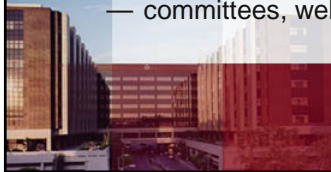


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Components of Data Quality Management Program

- **Data Governance**
 - Cross-functional committee make-up, structure, policy-setting & problem resolution functions (DPG & DQMWG)
- **Data Quality Management Unit**
 - funding and staffing to support the work
- **Data Quality Management Unit Activities**
 - putting out fires and pro-actively controlling data flow
- **Data Certification**
 - standardization of high priority data elements, stewardship
- **Communications**
 - committees, website, training and certification, surveys



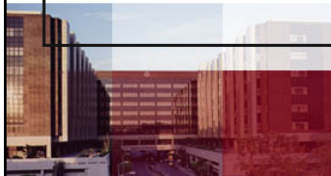
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Sponsor for Data Quality Initiative

Data Provider Group

- Convened by CEO as governance group to resolve ongoing data discrepancies
- Executive Sponsors: Senior Vice Presidents
- Cross-functional membership includes Vice Presidents and Directors of all departments that provide data to the organization
- Chair - Resource & Outcomes Management



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Task Force for Data Quality Issues ***Data Quality Management Working Group***

- Spun off as middle management task force
- Surfaces data quality issues; recommends solutions; and raises them up for prioritization
- Representation from data producers, data custodians, and data users
- Chair - Resource & Outcomes Management



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Staff Support for Data Quality Management ***The Data Quality Management Unit***

- Dedicated staff working with all affected areas to orchestrate necessary solutions
- Staffing Plan: Data Quality Manager, Team Lead, 2 Sr. Data Quality Analysts, and Database Specialist
- Resource & Outcomes Management oversees the DQMU



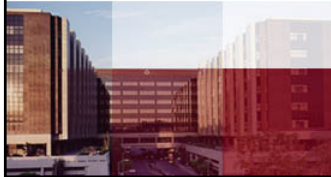
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Pieces of the Puzzle

Implementing Corporate Data Quality Management

- Creating core functions
- Creating governance structures
- Creating communication channels



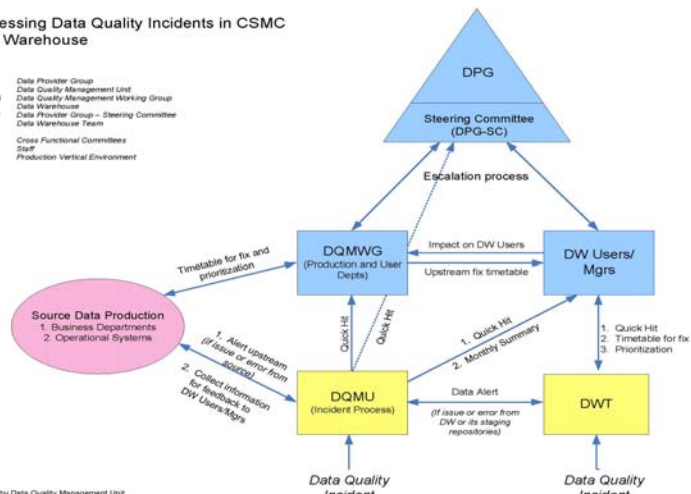
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Putting Out Fires

Addressing Data Quality Incidents in CSMC Data Warehouse

Legend:
 DPG Data Provider Group
 DQMU Data Quality Management Unit
 DQM/WG Data Quality Management Working Group
 DW Data Warehouse
 DPG-SC Data Provider Group – Steering Committee
 DWT Data Warehouse Team
 Blue Cross Functional Committee
 Yellow Staff
 Plus Production Vertical Environment

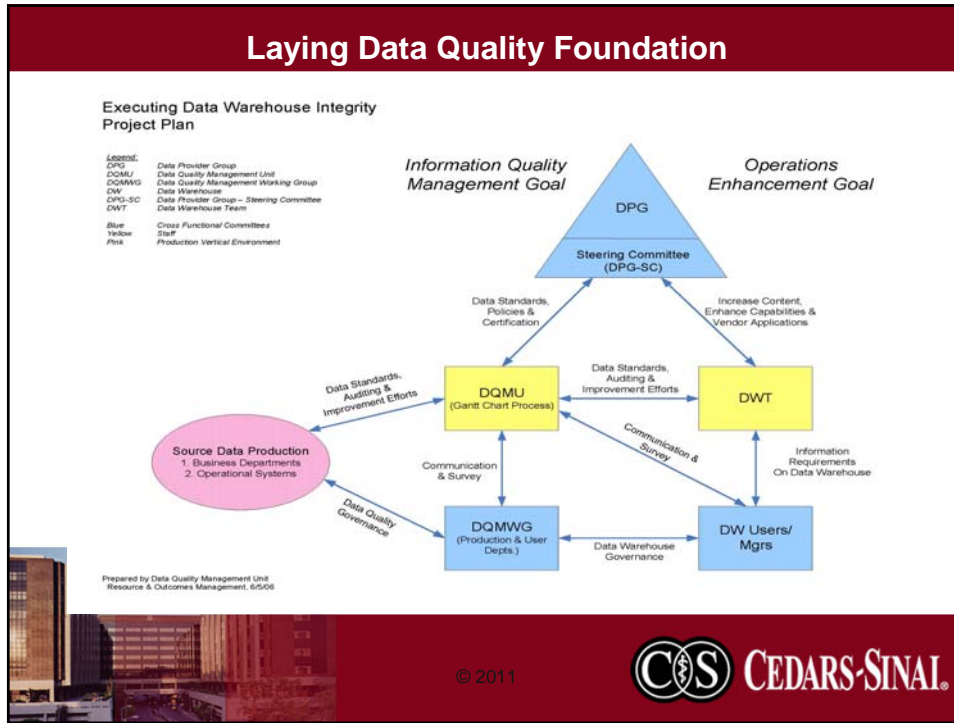


Prepared by Data Quality Management Unit
 Resource & Outcomes Management, 6/5/06



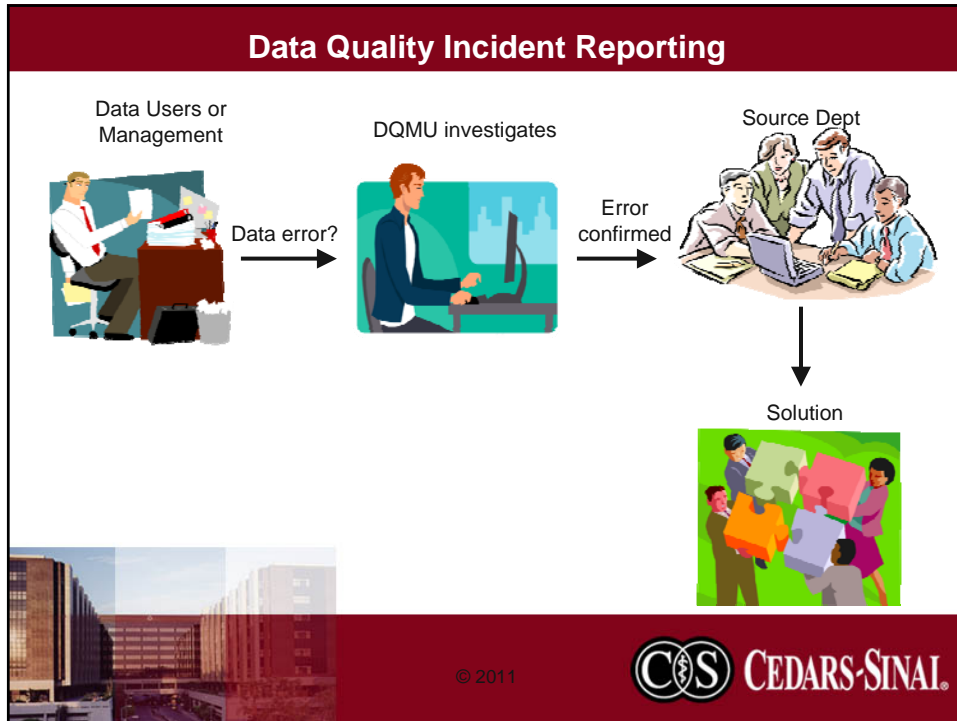
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- ## Expanding Core Functions
- **External Data Risk Mitigation Function**
 - Regulate release of clinical statistical information
 - Conduct clinical data quality audit


 - **Proactive Quality Assurance Function**
 - Monitoring data in corporate data warehouse
 - Validating data corrections in data warehouse
 - Validating management reports
 - Performing user acceptance testing on new applications
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Data Quality Incident Reporting

Standard Operating Procedure

- Aims to standardize approach to reporting, handling, and addressing data quality issues
- 12-step process: from incident investigation, reporting & resolution, to monitoring
- 400+ incidents since DQMU inception in 2005
- Cross disciplines and departments
- Multiple ways to report

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Data Quality Incident Reporting

Monitoring

- Started Nov 2010
- More proactive approach to deal with recurring data quality issues
- About 15 monitoring routines in place
- Errors sent directly to source department on a regular basis for resolution



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Data Quality Incident Reporting

What We Track

- Incident name/description
- Data category
- Reported by
- Error source department, error type
- Assigned to, status
- Number of affected records
- Table and fields affected
- Plus more...



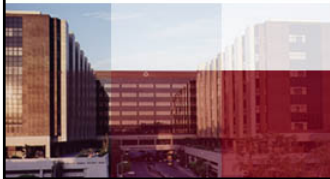
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Data Quality Incident Reporting

Metrics

- Number of new incidents
- Number of open incidents
- Number of closed incidents
 - By month
 - By category
 - By error source department
 - New/recurring



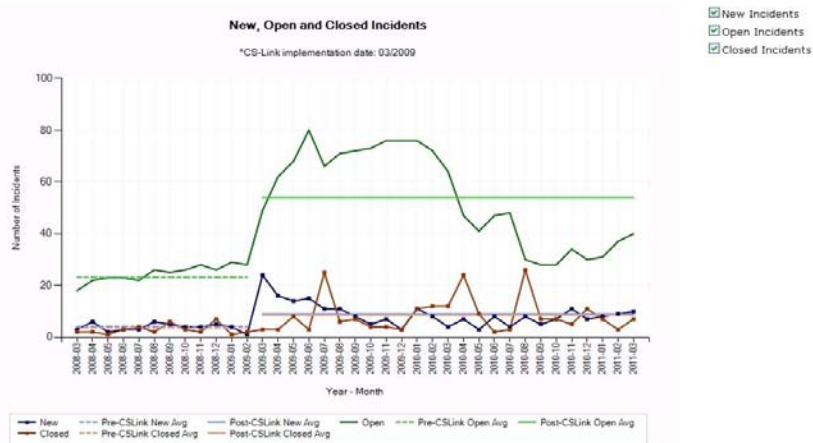
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Data Quality Incident Reporting

New, Open and Closed Incidents

*CS-Link implementation date: 03/2009



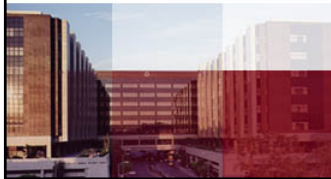
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Data Quality Incident Reporting

The Technical Details

- Started with MS Access database in 2005, converted to Oracle in 2009
- Kept MS Access front-end
- About 10 tables



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Purpose

- Provide a platform to keep data users informed on data quality
- Provide knowledge tools to report writers and management to help them become proficient in using the data
- Allow users to conveniently report new data quality incidents




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Information Products

<p style="text-align: center;"><u>Incidents</u> Data quality issues reported by data users</p>	<p style="text-align: center;"><u>Data Dictionary</u> Information about data such as meaning, origin, usage, and format</p>
<p style="text-align: center;"><u>Reporting Tips</u> Hints for accurate report writing</p>	<p style="text-align: center;"><u>Crosswalks</u> Information on mapping of values between systems</p>




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Evolution: Before

- Incidents - data quality issues already being tracked in a local database; new incidents published monthly via email
- Data Dictionary and Crosswalks - available on intranet site
- Report new incident - via email



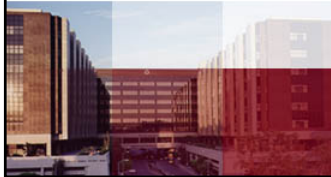
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Evolution: After

- “One Stop Shop” - all information products available in one location
- Web-based - accessible to anyone
- Searchable
- Ability to view incident status and findings
- New component - Reporting Tips
- Report New Incident - available online
- New Incident Alert



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The DQMU Info Center

Info Center Main Screen

CS
Data Quality Management Unit

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Incident · Reporting Tip · Data Dictionary · Crosswalk

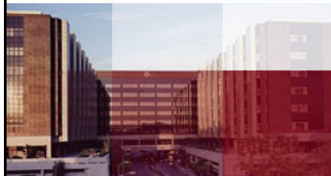
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CATEGORY SEARCH **TABLE/FIELD SEARCH** **INCIDENT SEARCH** **KEYWORD SEARCH**

Search by Category: ACCOUNT
ADMISSIONS - DISCHARGES
CENSUS
CHARGES
COST
COST CENTER
DIAGNOSIS

*Hold down the
control (Windows) or
Apple (Mac) key to
select multiple

Open Incidents Only
 CS-Link Information Only
 Data Dictionary





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Info Center Search Results - Incidents

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Incident - Reporting Tip - Data Dictionary - Crosswalk


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Your Query Parameters:
All Source Systems
Incident Create Date: >= 3/1/2011 and <= 3/31/2011
[Back to Search Page](#) [Export to Excel](#)

Filter Your Search Results
Category: ALL | Status: ALL | Prioritized: ALL | CS-Link: ALL | Reported By: ALL | Source Dept: ALL



INCIDENT (17) | Reporting Tip (0) | Data Dictionary (0) | Crosswalk (0)

Category	Incident Name	Status	Prioritized	Visits Affected (Updated As Of)	Table/Field	Tips	Date Created	Reported By	Source Dept
PATIENT TYPE OR SERVICES	427 - Incorrect DOB For Newborn Accounts	Open	No	5 (03/31/2011)	PATIENT.PATIENT_DATE_OF_BIRTH	No	3/31/2011	M	Admissions
ADMISSIONS - DISCHARGES	428 - Incorrect Newborn Admission Type for Non-Newborn Accounts	Open	No	51 (03/31/2011)	VISIT.ATV_CODE	No	3/31/2011	A P	Admissions
ADMISSIONS - DISCHARGES	425 - Missing Account For Organ Procurement Procedure	Open	No	1 (03/28/2011)	VISIT	No	3/28/2011	M	Admissions
PHYSICIAN	424 - Incorrect MD Attribution - Wrong Case Count in Physician Activity Summary Report (Recurring)	Open	No	9 (03/23/2011)	VISIT_PHYSICIAN_PHYS_ID	No	3/24/2011	J	HID
CHARGES	423 - Missing Organ Acquisition Charge Transactions For Solid Organ Transplant Cases	Open	No	5 (04/05/2011)	CHARGE_DETAIL.EAP_CODE	No	3/18/2011	T	PFS
PATIENT TYPE OR SERVICES	411 - Questionable Index Admission Case for LNK Readmission Plans	Open	Yes	15 (03/17/2011)	VISIT_MINOR_PAT_TYPE_CODE	No	3/17/2011	H A	Admissions & RDM
PATIENT TYPE OR SERVICES	422 - Questionable PCX Inpatient Same Day Stay Cases Found in Heart Failure Dataset	Closed	No	5 (03/14/2011)	VISIT_MINOR_PAT_TYPE_CODE	No	3/17/2011	J	Admissions

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Incident - Reporting Tip - Data Dictionary - Crosswalk

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Your Query Parameters:
CS-Link Information Only
Open Incidents Only
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Filter Your Search Results
Category: ALL | System: ALL | Contributed By: ALL

Incident (35) | **REPORTING TIP (16)** | Data Dictionary (18) | Crosswalk (11)


[Show All](#)

Category	Table/Field	Description	Related Incidents	System	Contributed By	Contributed Date
CHARGES	CHARGE_DETAIL CHARGE_DETAIL_MVW_CONSOLIDATED_ACCT_NO CHARGE_DETAIL_MVW	<p>Issue: Reporting charges for accounts that were converted from PCX to CS-Link</p> <p>Incident Reference: Incident #331 (Missing Charges in CHARGE_DETAIL Table for PCX-converted Accounts)</p> <p>Query Hints: Users reporting on charges for accounts that were converted from PCX to CS-Link should use CHARGE_DETAIL_MVW instead of CHARGE_DETAIL. Transactions from both PCX and the converted CS-Link accounts can be pulled by having the converted CS-Link account number in the CHARGE_DETAIL_MVW_CONSOLIDATED_ACCT_NO field.</p> <p>Issue: Patient Have count exempt fee for accounts converted from PCX</p>	<p>Incident 331 Incident 309</p>	CS-LINK	Data Warehouse	2/18/2010

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Info Center Search Results – Data Dictionary



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Filter Your Search Results
Category: [ALL] System: [ALL]


Incident (427) Reporting Tip (16) **DATA DICTIONARY (67)** Crosswalk (11)

Category	Description	Table/Field	System
ACCOUNT	Account Billing Status	VISIT_ACCT_BILLSTS_CODE	CS-LINK
ACCOUNT	Account Number	VISIT_ACCT_NO	PCX
ACCOUNT	Account Number / Hospital Account Record (HAR)	CHARGE_DETAIL_ACCT_NO CHARGE_DETAIL_MWV_ACCT_NO CHARGE_DETAIL_MWV_CONSOLIDATED_ACCT_NO PCX_EPIC_ACCT_MAP_EPIC_HAR_NO VISIT_ACCT_NO	CS-LINK
FINANCIAL	Account Receivable Amount	VISIT_SUMMARY_RECEIVABLE_AMT	PCX
FINANCIAL	Actual Reimbursement	VISIT_SUMMARY_ACTUAL_REIMB	PCX
ADMISSIONS - DISCHARGES	Admt Confirmation Status	HOSPITAL_CONTACT_ADMIT_CONF_STATUS	CS-LINK
ADMISSIONS - DISCHARGES	Admt Date	VISIT_ADMIT_DATE	PCX
CENSUS	Admt Nursing Station	VISIT_SUMMARY_ADMIT_NURSING_STATION	PCX
ADMISSIONS - DISCHARGES	Admt Source	ADMIT_SOURCE_ADMIT_SOURCE_CODE ADMIT_SOURCE_ADMIT_SOURCE_DESC VISIT_ADMIT_SOURCE_CODE	CS-LINK

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Filter Your Search Results
Category: [ALL] System: [ALL] Contributed By: [ALL]

Incident (427) Reporting Tip (16) Data Dictionary (67) **CROSSWALK (11)**

Category	Description	System	Contributed By
ADMISSIONS - DISCHARGES	Admt Source (Epic to UB-04)	CS-LINK	DQMU
ADMISSIONS - DISCHARGES	Discharge Disposition (Epic to UB-04)	CS-LINK	DQMU
CHARGES	EAP to CDM crosswalk - Panditaradhyula - 1/14/09	CS-LINK	E
INSURANCE	Epic Payor to IM crosswalk - Stout - 12/3/08	CS-LINK	E
PATIENT TYPE OR SERVICES	Ethnicity	CS-LINK	DQMU
PATIENT TYPE OR SERVICES	Marital Status	CS-LINK	DQMU
PATIENT TYPE OR SERVICES	Minor Patient Type	CS-LINK	DQMU
CENSUS	Outpatient Units to Department Crosswalk - Chang - 2/20/09	CS-LINK	E
PHYSICIAN	Physician Role	CS-LINK	DQMU
PATIENT TYPE OR SERVICES	Race	CS-LINK	DQMU
CENSUS	Unit/Room/Bed to Department Crosswalk - Chang - 2/20/09	CS-LINK	S

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Info Center Report New Incident

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Incident - Reporting Tip - Data Dictionary - Crosswalk

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Incident Submission Form

Reported By: * First Name * Last Name
* Email Address
CC

Incident Details

* Incident Description

Business Impact

Total time spent on issue

Date range of your analysis From To

Do you have a workaround for this issue? Yes No

Keyword or phrase for your reference

Attach Document(s)
20MB maximum cumulative file size

*Required Fields

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EDIT Incident Alert Subscription

Subscriber Email:

Send me an email alert for ALL new incidents.

Email me when there is a new incident related to the following:

CATEGORIES

ACCOUNT
ACCOUNTS_EXCHANGE
CHANGES
COST
COST CENTER
PURPOSES

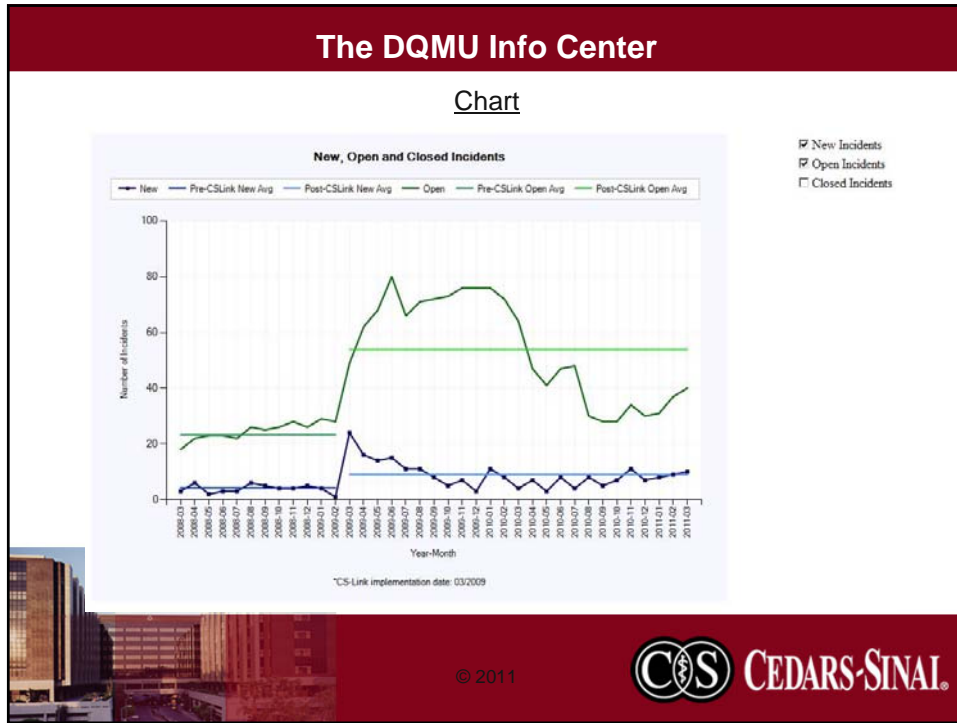
OR

TABLES/FIELDS

Table	Field
VISIT	ACCT_NO Subscribe
VISIT_PRIMARY_PHYSICIAN_MW/	DISCHARGE_DATE Subscribe

Add additional:
 Select Table/Field
 Select Field Only
 Table/Field
 Field Only:

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The Technical Details

- Oracle Database: made use of the department's existing database platform
- ASP.Net: web framework used to build the site. Made use of the department's existing web server

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The Clinical Statistical Information (CSI) Initiative

Defining Clinical Statistical Information

- Clinically-oriented data or statistics about specific clinically-defined patient populations or individual patient records containing clinical data, AND
- The above data or statistics become available in the public domain or for use by an outside organization

This definition does not apply to the following: (a) billing data sent to payers; (b) research data under IRB; and (c) financial, operational, or administrative data that are sent externally without any Clinical Statistical Information.



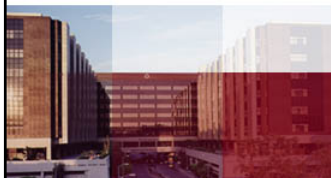
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Policy Evolution

- In 2002, a memorandum from the Medical Center's President and CEO specifically required all Medical Center departments to forward requests for data for public reporting of CSI to the Resource and Outcomes Management (ROM) Department for review and approval.
- In 2008, Internal Audit identified improvement opportunities in policies and procedures for accumulating and submitting CSI to outside organizations. ROM was charged to follow up with Medical Center departments who have not obtained proper approval for CSI submissions to external organizations.



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The Clinical Statistical Information (CSI) Initiative

Policy Evolution (cont'd)

- In 2008, corporate policy and procedure implemented governing all CSI released to outside organizations to be systematically prepared and formally approved prior to release.
 - The overarching purpose of this policy and procedure is to minimize any such risks, by minimizing the possibility that inaccurate or incomplete Clinical Statistical Information is released to outside organizations.
- In 2010, ROM Clinical Data Quality Audit for key data elements.
 - Data quality audit aims to ensure data integrity in the input, process, and output data prior to data submission to external organizations.

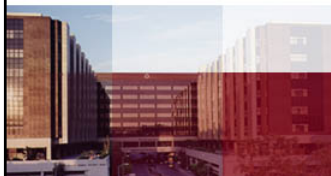
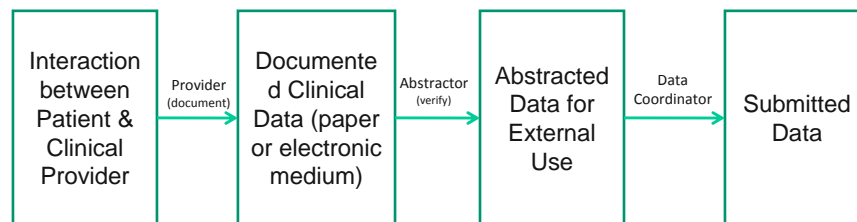


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Clinical Data Production Process



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Basic Evaluation of Business Process for Data Production

- Create detailed business/data process flow diagram from initial data collection to final approved data for external release
- Identify key requirements in the process
 - Data elements collected?
 - Patient selection criteria, inclusions and exclusions?
 - Primary data collector?
 - Who produces the approved final data?
 - When is the data collected, reviewed, edited and produced?
 - How is the data collected? Paper, database, web-based, etc

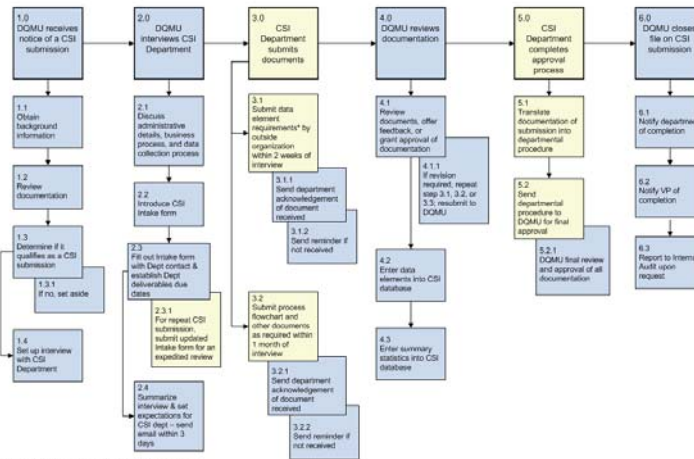


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DQMU Standard Operating Procedure: Clinical Statistical Data Submission

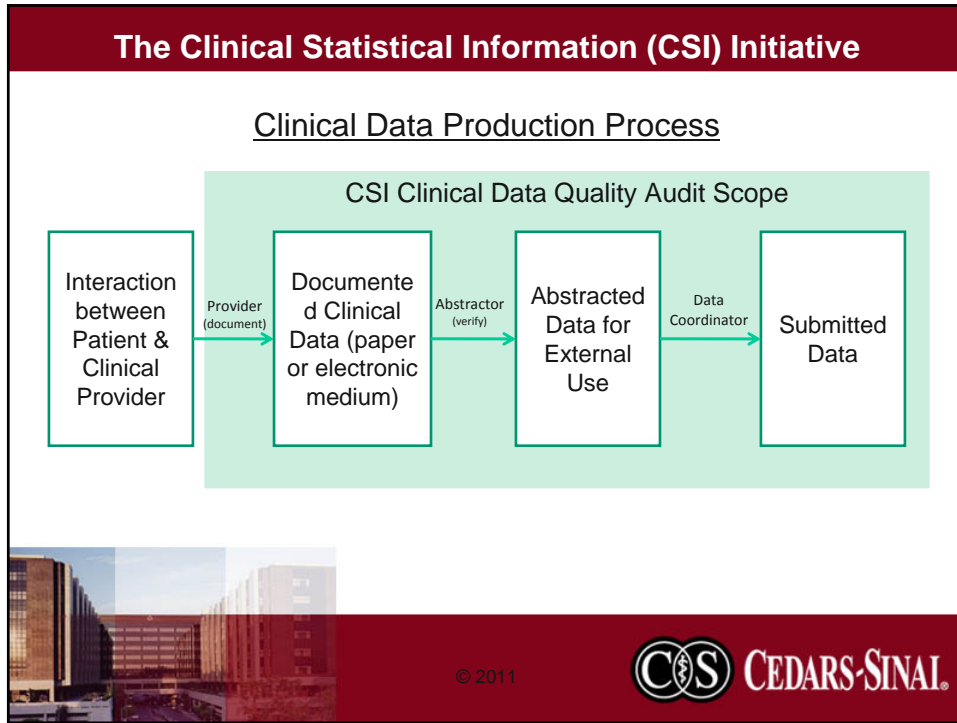




* Data element requirements refer data fields collected in CSI submission's survey, questionnaires, web pages, etc.
 Prepared by Data Quality Management Unit
 Resource & Outcomes Management, 2/25/09

DQMU: [Blue Box] CSI Department: [Yellow Box]

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- ### The Clinical Statistical Information (CSI) Initiative
- #### Data Quality Audit
- Notify clinical data submission client of data quality audit
 - Develop data quality audit strategy and data control plan
 - **Input testing:** identify and document data input methods
 - **Process testing:** track flow of specific data element and/or record from source through submission
 - **Output testing:** validate representative sample of submitted data against source data
- 
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Data Quality Audit (cont'd)

- Present plan to client to establish agreement
- Execute testing plan with client
- Compile test results
- Report test results and significance of findings to client
- Recommend if necessary opportunities for improvement to client
- Follow-up with client on improvement plan

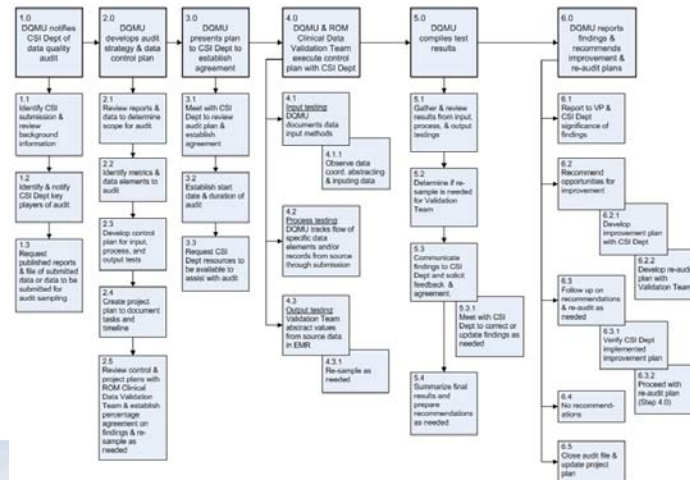


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The Clinical Statistical Information (CSI) Initiative

DQMU Standard Operating Procedure: Clinical Data Quality Audit



Prepared by Data Quality Management Unit
Resource & Outcomes Management, 4/25/11

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Quality Assurance Activities

- CSI submission: UHC clinical database data extracts
- User Acceptance Testing: Physician profiling application
- Rule-based data monitoring: Corporate Data Warehouse
- Report validation: ROM external reporting
- EHR validation: CS-Link Data Quality Dashboard

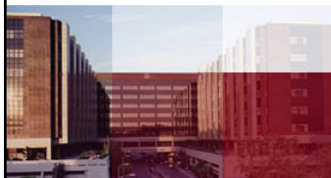


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CS-Link Data Quality Dashboard Timeline

- CS-Link Quality and Regulatory Data Committee
 - Chartered June 2009
 - Broad membership
- CS-Link Data Quality Dashboard Working Group
 - Initiated December 2010
 - Membership includes representatives from CS-Link Clinical Documentation Build Team and CS Data Quality Management Team
- Development Currently Underway
 - Pilot Dashboard
 - Scalable Approach



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CS-Link Quality & Regulatory Data Committee

Committee Objectives

- Identify data elements necessary for Medical Center functions that should be available in CS-Link
- Provide a multi-disciplinary forum for review of CS-Link clinical content for purposes of Quality/Safety, resource management and Regulatory guidelines
- Help ensure that CS-Link designed clinician documentation will support abstracting and coding
- Ensure Quality and Core Measure reporting needs can be supported with CS-Link documentation tools
- Ensure all licensing requirements are maintained with CS-Link



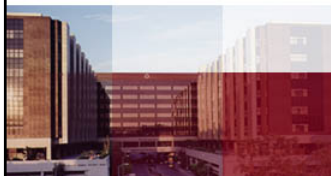
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CS-Link Quality & Regulatory Data Committee

Key Activities

- Inventory of currently reported and anticipated data related to clinical care needed for public reporting or internal quality management
- Review CS-Link clinical content to ensure the support needs identified above
- Note where changes/modifications are needed, provide feedback to application team, ensure changes are made.



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CS-Link Quality & Regulatory Data Committee

Key Activities (cont'd)

- Provide a consistent data quality perspective for content review and oversight
- Own the migration of current data abstracting related to quality, safety, regulatory and core measure reporting to CS-Link
- Develop and update dashboard of measures to reflect progress

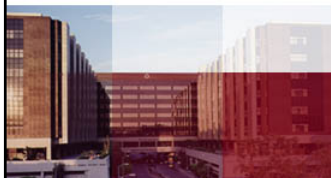


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Charge for CS-Link Data Quality Dashboard Working Team

- For each key Quality Council Dashboard Measure, develop method for evaluating data quality at three points of data lifecycle
 - ensuring input data quality
 - ensuring internal logic data quality
 - ensuring extract data quality
- If all three are “green,” then leadership can be confident that the measure is an accurate representation of performance



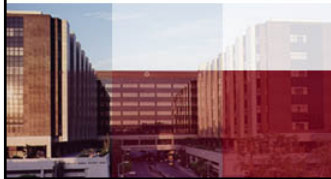
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CS-Link Data Quality Dashboard: Progress

- Focus of Pilot Determined
 - VTE Prophylaxis for ICU patients that are part of the VAP Bundle
 - Will be used to develop a standardized process for evaluating data quality of other key Quality Council measures derived from CS-Link.

- The build team had completed, but not released, a new build for VAP Bundle, including VTE Prophylaxis, due to perceived data quality problems with initial build released with IP2.

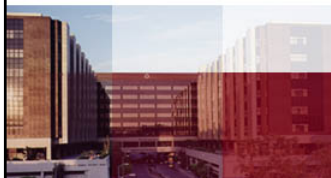


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Process for Evaluating Input Data Quality

- Identify data elements needed to operationalize VAP ICU VTE Prophylaxis measure
- Develop Data Acquisition Workflow to document how required data elements are input into CS-Link
- Ensure new build will cover “gaps” by comparing:
 - Original CareVue data flow (believed to be correct)
 - Current CS-Link build (believed to be problematic)
 - Redesigned CS-Link build (believed to be correct)
- Develop and test reports to allow ongoing assurance of continuing data input integrity



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Process for Evaluating Internal Logic Data Quality

- Evaluate how each data element needed to operationalize VAP ICU VTE Prophylaxis measure:
 - flows from point of entry into CS-Link through the various internal CS-Link environments
 - until it reaches the CS-Link Clarity data base (from which it will be extracted for the Quality Council Dashboard)
- Ensuring integrity by highlighting any decision-points, programmed transformations, or calculations implemented during this process
- Develop and test reports to allow ongoing assurance of continuing internal logic data integrity

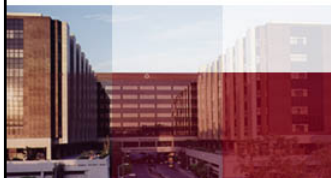


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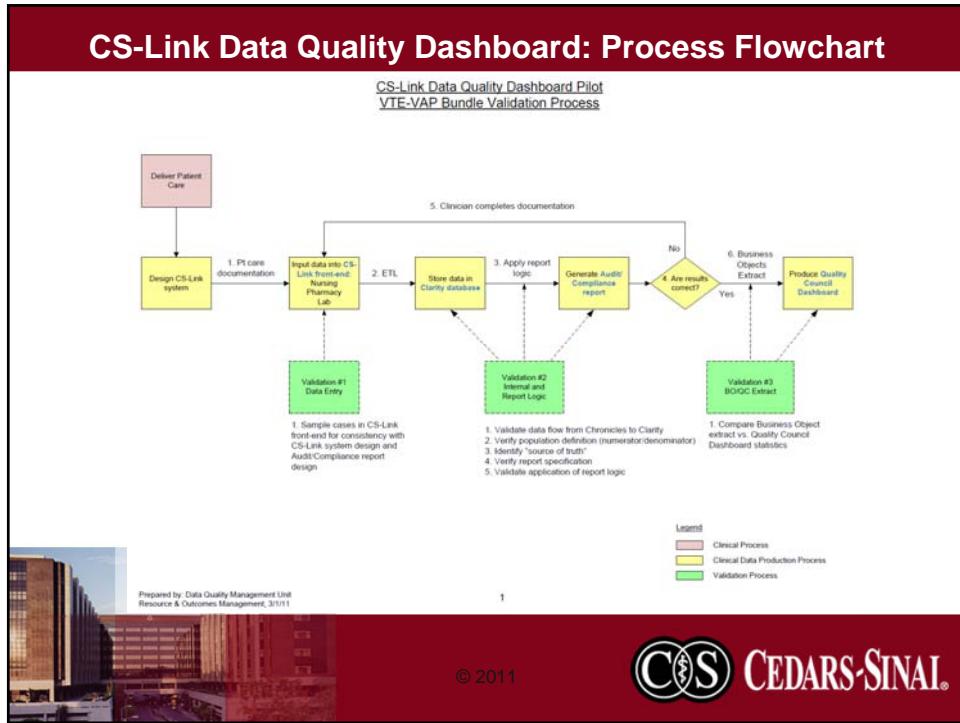
Process for Evaluating Extract Data Quality

- Evaluate how each data element needed to operationalize VAP ICU VTE Prophylaxis measure:
 - is extracted from CS-Link Clarity data base for use by the Business Objects team to construct the measure in the Quality Council Dashboard
- Ensuring integrity by highlighting any decision-points, programmed transformations, or calculations implemented during this process
- Develop and test reports to allow ongoing assurance of continuing data extract integrity



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Data Validation & Risk Management

Level / Approach	Method	Risk Management Effectiveness*	Data Access Requirement	Currently Applied
1. Sample-based	Spot check few cases	Low	Application, front-end	Yes
2. Population-based	Aggregated, ad hoc query	Medium	Database, back-end	No
3. Proactive monitoring	Rule-based, ongoing	High	Continuous; Database, back-end	No
* Special Case: Report validation	Report specs verification & content validation	High	Report specs; Database, back-end	No (specs & spot check only)

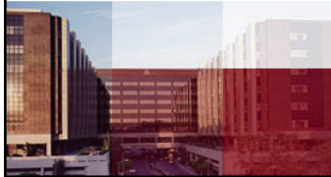
* Effectiveness is based on low to zero risk tolerance for error.

Prepared by: Data Quality Management Unit
Resource & Outcomes Management, 4/20/11

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Concluding Thoughts on EHR Validation

- We believe we have a good working model
- We have established communication between the build team and the data quality management team
- There are limitations to the degree that this process can mitigate risks
- We will be challenged to implement this process for multiple measures simultaneously



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LESSONS LEARNED

- Simplify the message and repeat it constantly
- Usable data = Meaningful data (the user has the final say)
- Start with small projects and try to build on existing efforts to get early wins
- DQM work is inherently collaborative: governance, working groups, and problem resolution must include sufficient cross-functional representation
- Create a sustainable program, not just a short-lived project, by establishing and communicating standard routines
- Longstanding data problems usually result from divergent business objectives among data producing departments; the technical solution is usually the smaller hurdle.



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