Panel Discussion

Data Aggregator's Dilemma: Partnerships for Managing Data Quality in a Shared Database

ABSTRACT

The University HealthSystem Consortium (UHC) operates the most widely used clinical comparison and benchmarking database among the major academic (teaching) medical centers. One of the UHC Data Services functions performing data quality and validity checks on member data prior to the loading into the Clinical Data Base (CDB) system. Data Services has developed a sophisticated system of data logic checks and submission feedback tools to insure data is submitted according to data specifications and to insure the validity of the data to the maximum extent possible. Use of these feedback mechanisms by members is critical to the success of the data integrity program of the CDB.

Since UHC's business model depends on hospitals being able to compare with each other on key metrics, it is imperative that each hospital comply with minimum standard of data quality. To realize this goal, UHC has invested heavily in maintaining a data quality and compliance framework. UHC uses field level edits, statistical quality checking, hospital-specific historical data profiling, configurable rules engine, and a robust feedback mechanism to monitor and control data integrity.

Member collaboration commitment is critical to achieving compliance by responding to rigorous data quality checks. Periodic industry updates to data structures (e.g. ICD9/DRG/MSDRG/POA Flags/NUBC) respond to changes. Ensuring HIPAA compliance, incoming and outgoing is a regulatory requirement. The UHC strategy is to become an active hospital resource extension.

BIOGRAPHY

Allen Juris
Assistant Director for Data Services
University HealthSystem Consortium

Allen Juris is Assistant Director for Data Services, Technology Services (TS) at UHC. In this role since June 1990 he is responsible for the automated patient data production system at UHC. He works closely with UHC members and the clinical experts at UHC to ensure the integrity of the data feeds and the application of the risk adjustment models and algorithms of the UHC Clinical Data Products. Mr. Juris assists members in extracting data from their various systems and interpreting their data quality reports. He also maintains the documentation of file specifications and editing algorithms.

Prior to UHC, Mr. Juris was the data management specialist at the Renal Network of Illinois. He was solely responsible for management of a federally mandated patient tracking system of End Stage Renal Disease patients receiving dialysis and/or kidney transplants in the state of Illinois. Duties included monthly reports of patient activity for transmission to the federal government. Additionally, he maintained the patient database that was used for quality assurance of patient care by the organization and participated on the governing council.

Martha Radford
Chief Quality Officer and Professor of Medicine
New York University Langone Medical Center

Dr. Martha Radford is the Chief Quality Officer and Professor of Medicine (Cardiology) at New York University Langone Medical Center. Dr. Radford received her Bachelor of Science in genetics from University of California, Berkeley in 1970, her Master of Arts in molecular biology from University of California, Berkeley in 1973, and her MD degree from Harvard Medical School in 1978. She trained in internal medicine at Brigham and Women's Hospital, and cardiovascular disease at Duke University Medical Center. Between 1984 and 1998, she was a member of the cardiology faculty at the University of Connecticut School of Medicine.

Dr. Radford first became involved with quality improvement and quality related research in 1993, when she became associated with the Connecticut Peer Review Organization and the Health Care Financing Administration (later the Center for Medicare and Medicaid Services) through its innovative Cooperative Cardiovascular Project. She has actively collaborated with the Cardiovascular Outcomes Research Group with Dr. Harlan Krumholz at Yale University School of Medicine, the Atrial Fibrillation Outcomes Research Group with Dr. Brian Gage at Washington University (St. Louis) School of Medicine, and other outcomes research groups.

Since 1998, Dr. Radford has devoted her professional life to quality and outcomes of care as Director of Clinical Quality for the Yale New Haven Health System (1998-2005) and Chief Quality Officer for NYU Langone Medical Center (since 2005). She has demonstrated leadership in understanding and improving quality of care for all disciplines in two large, complex academic health systems.

Allison Sabel
Director of Biostatistics and Clinical Data Warehousing
Denver Health Medical Center

Dr. Allison Sabel is the Director of Biostatistics and Clinical Data Warehousing at Denver Health Medical Center, Colorado's primary safety-net institution. Dr. Sabel completed a Masters in Public Health in Epidemiology, PhD in Biostatistics, and MD at Tulane University. She is a Board Certified Preventive Medicine physician and certified in Medical Quality by the American Board of Medical Quality. She is a fellow of the National Association of Public Hospitals and Health Systems (NAPH) and spent a year focusing on the development and support of quality improvement in public hospitals. Dr. Sabel was the Medical

Director of Clinical Data and Informatics for University HealthSystem Consortium (UHC), an alliance of 103 academic medical centers and their affiliated hospitals. She led clinical efforts in risk adjustment and analytics for UHC's clinical tools, including the Clinical Data Base, Clinical Resource Manager, and Core Measures Data Base. Dr. Sabel is an Assistant Professor in the Department of Biostatistics and Informatics at the University of Colorado Denver. Dr. Sabel serves on many regional and national advisory boards addressing issues of health care quality, accessibility, and disparities, including the Colorado Health Facility Acquired Infections Advisory Committee, Denver Drug Strategy Commission, Denver Epidemiology Work Group, and NAPH Quality Advisory Committee.

Eric Hixson
Director, Data Resources Management
Cleveland Clinic Foundation

Eric Hixson is the Director, EBI Quality Data in the Business Intelligence Medical Operations Division at the Cleveland Clinic Foundation He received his PhD from Case Western Reserve University in Epidemiology and Biostatistics and MBA from Cleveland State University in Healthcare Administration. He has more than 10 years experience in the development and implementation of quality measurement and reporting initiatives, infrastructure development, and registry implementation and operations.

Currently, he manages quality data infrastructure planning and development; provides operational management of Core Measures, NSQIP surgical quality, adult, pediatric and neonatal intensive care clinical registries, and the NRCPR registry; integrates business intelligence tools into quality improvement and reporting initiatives; and collaborates in a number of health services, outcomes, and clinical research related activities.

UHC University HealthSystem Consortium

Data Aggregator's Dilemma:

Partnership for Managing Data Quality in a Shared Database

Allen L. Juris
Assistant Director, UHC Data Services
July 14, 2011

THE POWER OF COLLABORATION

About UHC

The University HealthSystem Consortium is a non-profit, member-owned alliance of academic medical centers *and their networks*.

As a membership organization, UHC provides its 113 AMC members, 254 affiliated hospitals, and nearly 80 faculty practice plan members with resources aimed at improving performance levels in clinical, operational, and financial areas.

Comparative Data Informatics (CDI) Provides a Suite of Products & Services

- UHC Clinical Data Base (CDB)
- Line item Detail resource utilization
- Regulatory reporting to JC & CMS
- Select State level reporting
- Suite of Performance reports released quarterly to Senior leaders and managers
- UHC Quality & Accountability Score card
- Custom Analyses

The Clinical Data Base Provides Comparative Data on Peer Academic Medical Centers

- CDB pools clinical and financial data using discharge abstract summaries and UB-04 data
- CDB provides cost values estimated from charges
- Calculate mortality rates, observed and expected
- Calculate related and unrelated readmission statistics
- Readily identify HACs and AHRQ quality and safety measures
- Robust physician profiling

Scope and Scale

- Receive administrative data submissions from ~200 participant hospitals
  - Patient demographics
  - Clinical & financial components
- Receive data from partners – Thomson Reuters, Press Ganey – operational, satisfaction
- Soon to acquire data from outside sources
  - National Death File (30 day mortality)
  - Lab results
  - CDC's NHSN Infection data
-

Data Processing Overview

- Collection occurs from all institutions on a monthly basis 2 - 6 weeks after the close of a month
- Editing routines are performed to determine data integrity and scores are calculated based on quality indicators
- Data may be accepted and passed to the next processing step, or rejected upon which the institution must resubmit information
- Once accepted, data is risk adjusted and cost estimates are calculated
- Populate UHC data warehouse – Single version of truth near real-time

Data Quality Principles

- Standardize the thresholds for data quality for all hospitals
- Provide near real-time user friendly feedback on quality of data
- Allow for multiple submissions from hospitals to improve quality
- Employ a data quality rule set that is adaptable to new information
- Err towards caution; when in doubt have human review

Data Quality Checks

- Field Level Checks
  - Volume of missing or invalid
- Relational Checks
  - Interdependencies; sex to procedure, age to diagnosis
  - Total ICU LOS not <= Total LOS
- Profile Checks
  - Z Score check vs. Current Population
- Domain Checks
  - Validate against known code sets; ICD9, PoO, Revenue codes, etc.
- Leverage 3rd Party software intelligence
  - 3M's MSDRG & APR Groupers, AHRQ Quality & Safety, HAC, POA, etc.

Devil's in the Details

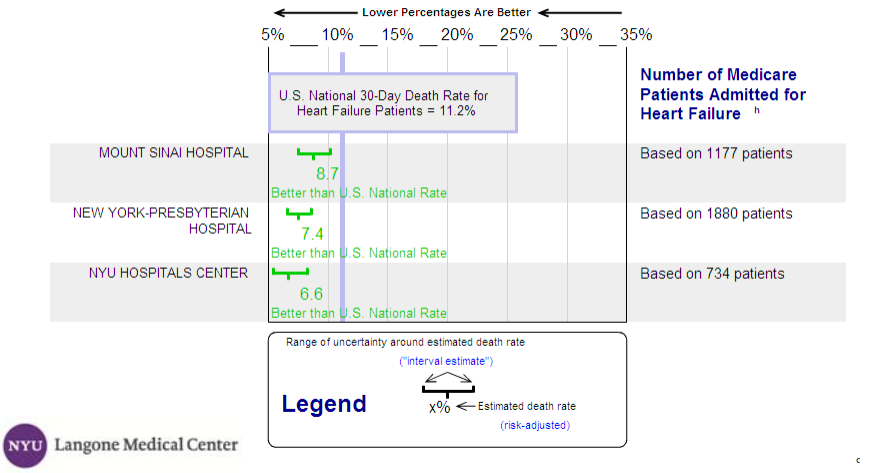
- It's not a Set it and Forget it
- Establishing a working partnership with the participants is crucial
- Passing UHC's rule sets does not mean it's correct
- Hospital commitment to ongoing quality monitoring is a challenge
- Introducing changes and/or new data points to the feed can be chaotic but necessary to keep current
- Constant monitoring and tweaking of rule sets is necessary

Hospital Administrative Data Quality

Martha J. Radford, MD
Chief Quality Officer
NYU Langone Medical Center
New York, NY
July 2011

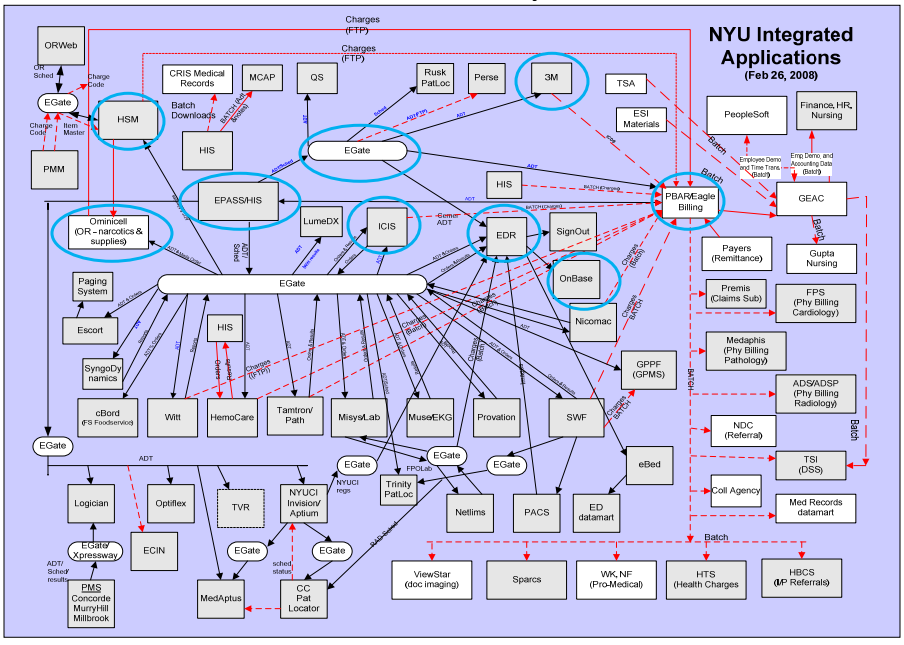
Hospital Administrative Data
Hospitals' "Face to the World"

Death Rate for Heart Failure Patients



NYU Langone Medical Center

NYULMC Data Systems

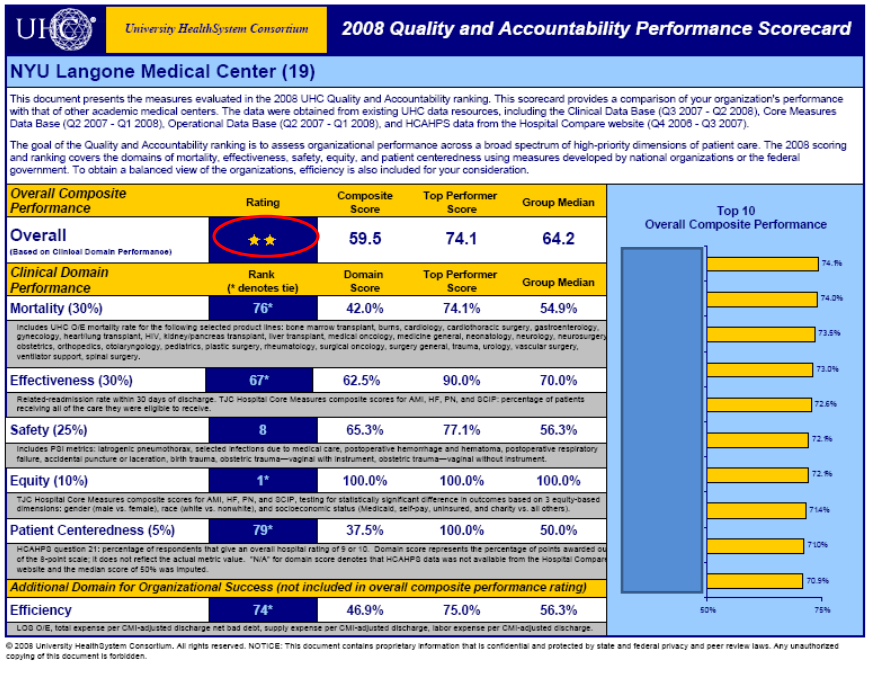


What's In the Hospital Bill?

- Patient identification information
- Patient demographic information
- Where the patient came from
- Where the patient went after discharge
- Diagnoses
- Procedure codes

} Matrix to DRG

NYU Langone Medical Center



UHC University HealthSystem Consortium — 2008 Quality and Accountability Performance Scorecard

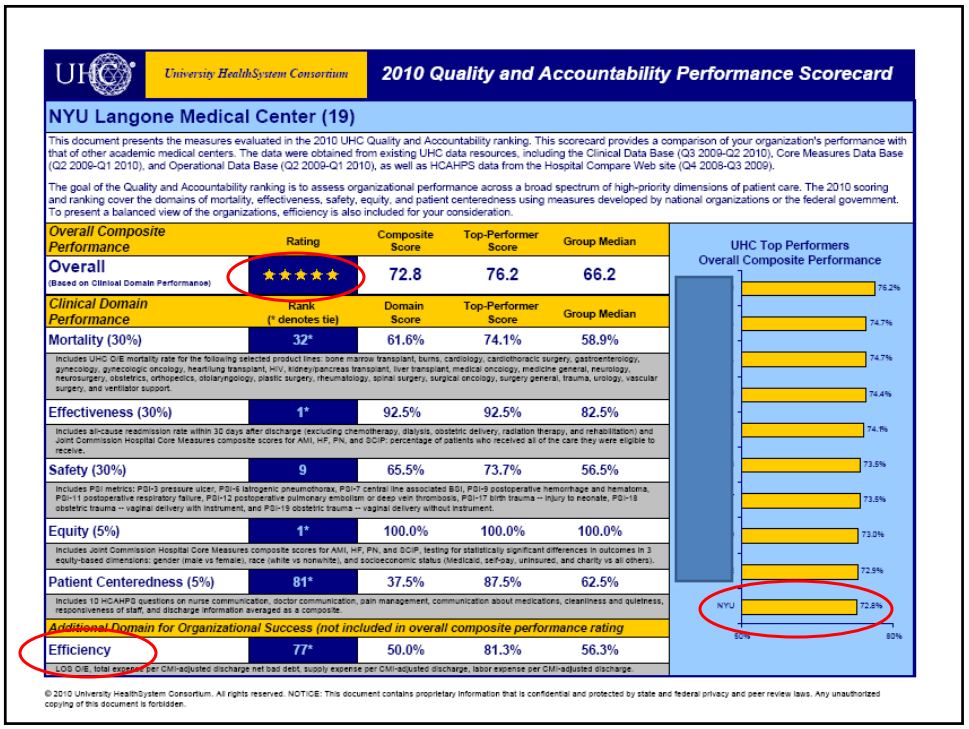
NYU Langone Medical Center (19)

This document presents the measures evaluated in the 2008 UHC Quality and Accountability ranking. This scorecard provides a comparison of your organization's performance with that of other academic medical centers. The data were obtained from existing UHC data resources, including the Clinical Data Base (Q3 2007 - Q2 2008), Core Measures Data Base (Q2 2007 - Q1 2008), Operational Data Base (Q2 2007 - Q1 2008), and HCAHPS data from the Hospital Compare website (Q4 2006 - Q3 2007).

The goal of the Quality and Accountability ranking is to assess organizational performance across a broad spectrum of high-priority dimensions of patient care. The 2008 scoring and ranking covers the domains of mortality, effectiveness, safety, equity, and patient centeredness using measures developed by national organizations or the federal government. To obtain a balanced view of the organizations, efficiency is also included for your consideration.

Overall Composite Performance	Rating	Composite Score	Top Performer Score	Group Median
Overall (Based on Clinical Domain Performance)	★★	59.5	74.1	64.2
Clinical Domain Performance	Rank (* denotes tie)	Domain Score	Top Performer Score	Group Median
Mortality (30%)	76*	42.0%	74.1%	54.9%
Includes UHC O/E mortality rate for the following selected product lines: bone marrow transplant, burns, cardiology, cardiothoracic surgery, gastroenterology, gynecology, heart/lung transplant, HIV, kidney/pancreas transplant, liver transplant, medical oncology, medicine general, neonatology, neurology, neurosurgery, obstetrics, orthopedics, otolaryngology, pediatrics, plastic surgery, rheumatology, surgical oncology, surgery general, trauma, urology, vascular surgery, ventilator support, spinal surgery.				
Effectiveness (30%)	67*	62.5%	90.0%	70.0%
Related-readmission rate within 30 days of discharge. TJC Hospital Core Measures composite scores for AMI, HF, PN, and SCIP: percentage of patients receiving all of the care they were eligible to receive.				
Safety (25%)	8	65.3%	77.1%	56.3%
Includes PSI metrics: iatrogenic pneumothorax, selected infections due to medical care, postoperative hemorrhage and hematoma, postoperative respiratory failure, accidental puncture or laceration, birth trauma, obstetric trauma—vaginal with instrument, obstetric trauma—vaginal without instrument.				
Equity (10%)	1*	100.0%	100.0%	100.0%
TJC Hospital Core Measures composite scores for AMI, HF, PN, and SCIP, testing for statistically significant difference in outcomes based on 3 equity-based dimensions: gender (male vs. female), race (white vs. nonwhite), and socioeconomic status (Medicaid, self-pay, uninsured, and charity vs. all others).				
Patient Centeredness (5%)	79*	37.5%	100.0%	50.0%
HCAHPS question 21: percentage of respondents that give an overall hospital rating of 9 or 10. Domain score represents the percentage of points awarded ou of the 8-point scale; it does not reflect the actual metric value. "N/A" for domain score denotes that HCAHPS data was not available from the Hospital Compare website and the median score of 50% was imputed.				
Additional Domain for Organizational Success (not included in overall composite performance rating)				
Efficiency	74*	46.9%	75.0%	56.3%
LOS O/E, total expense per CMI-adjusted discharge net bad debt, supply expense per CMI-adjusted discharge, labor expense per CMI-adjusted discharge.				

Top 10 Overall Composite Performance



University HealthSystem Consortium

2010 Quality and Accountability Performance Scorecard

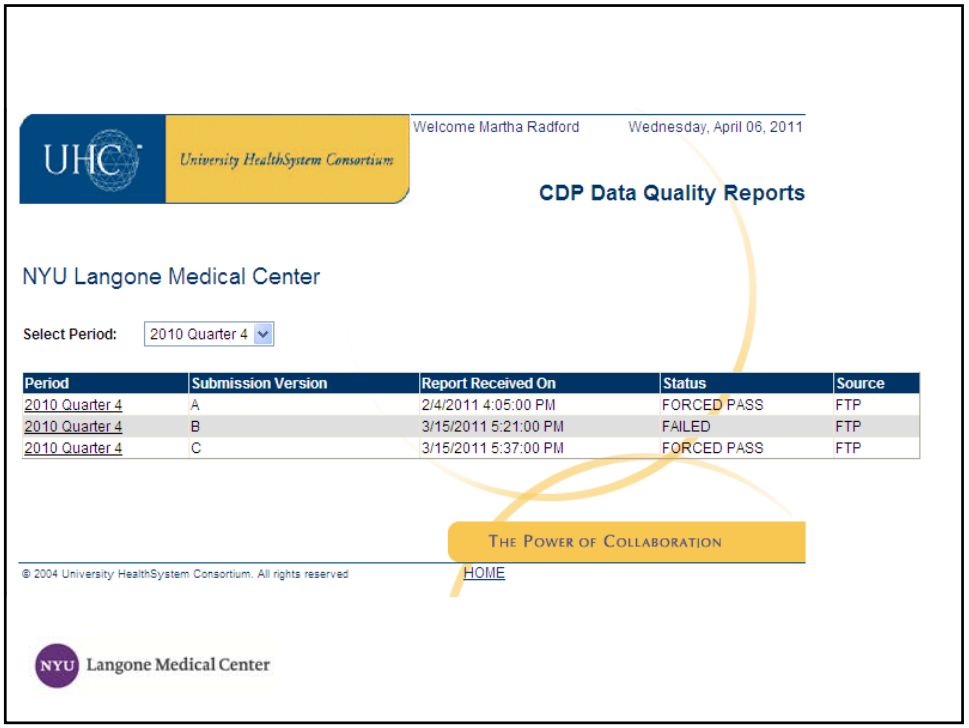
NYU Langone Medical Center (19)

This document presents the measures evaluated in the 2010 UHC Quality and Accountability ranking. This scorecard provides a comparison of your organization's performance with that of other academic medical centers. The data were obtained from existing UHC data resources, including the Clinical Data Base (Q3 2009-Q2 2010), Core Measures Data Base (Q2 2009-Q1 2010), and Operational Data Base (Q2 2009-Q1 2010), as well as HCAHPS data from the Hospital Compare Web site (Q4 2008-Q3 2009).

The goal of the Quality and Accountability ranking is to assess organizational performance across a broad spectrum of high-priority dimensions of patient care. The 2010 scoring and ranking cover the domains of mortality, effectiveness, safety, equity, and patient centeredness using measures developed by national organizations or the federal government. To present a balanced view of the organizations, efficiency is also included for your consideration.

Overall Composite Performance	Rating	Composite Score	Top-Performer Score	Group Median
Overall (Based on Clinical Domain Performance)	★★★★★	72.8	76.2	66.2
Clinical Domain Performance	Rank (* denotes tie)	Domain Score	Top-Performer Score	Group Median
Mortality (30%)	32*	61.6%	74.1%	58.9%
Includes UHC O/E mortality rate for the following selected product lines: bone marrow transplant, burns, cardiology, cardiothoracic surgery, gastroenterology, gynecology, gynecologic oncology, heart/lung transplant, HIV, kidney/pancreas transplant, liver transplant, medical oncology, medicine general, neurology, neurosurgery, obstetrics, orthopedics, otolaryngology, plastic surgery, rheumatology, spinal surgery, surgical oncology, surgery general, trauma, urology, vascular surgery, and ventilator support.				
Effectiveness (30%)	1*	92.5%	92.5%	82.5%
Includes all-cause readmission rate within 30 days after discharge (excluding chemotherapy, dialysis, obstetric delivery, radiation therapy, and rehabilitation) and Joint Commission Hospital Core Measures composite scores for AMI, HF, PN, and SCIP: percentage of patients who received all of the care they were eligible to receive.				
Safety (30%)	9	65.5%	73.7%	56.5%
Includes PSI metrics: PSI-3 pressure ulcer, PSI-6 iatrogenic pneumothorax, PSI-7 central line associated BSI, PSI-9 postoperative hemorrhage and hematoma, PSI-11 postoperative respiratory failure, PSI-12 postoperative pulmonary embolism or deep vein thrombosis, PSI-17 birth trauma -- injury to neonate, PSI-18 obstetric trauma -- vaginal delivery with instrument, and PSI-19 obstetric trauma -- vaginal delivery without instrument.				
Equity (5%)	1*	100.0%	100.0%	100.0%
Includes Joint Commission Hospital Core Measures composite scores for AMI, HF, PN, and SCIP, testing for statistically significant differences in outcomes in 3 equity-based dimensions: gender (male vs female), race (white vs nonwhite), and socioeconomic status (Medicaid, self-pay, uninsured, and charity vs all others).				
Patient Centeredness (5%)	81*	37.5%	87.5%	62.5%
Includes 10 HCAHPS questions on nurse communication, doctor communication, pain management, communication about medications, cleanliness and quietness, responsiveness of staff, and discharge information averaged as a composite.				
Additional Domain for Organizational Success (not included in overall composite performance rating				
Efficiency	77*	50.0%	81.3%	56.3%
LOS O/E, total expense per CMI-adjusted discharge net bad debt, supply expense per CMI-adjusted discharge, labor expense per CMI-adjusted discharge.				

UHC Top Performers
Overall Composite Performance



University HealthSystem Consortium

Welcome Martha Radford Wednesday, April 06, 2011

CDP Data Quality Reports

NYU Langone Medical Center

Select Period: 2010 Quarter 4

Period	Submission Version	Report Received On	Status	Source
2010 Quarter 4	A	2/4/2011 4:05:00 PM	FORCED PASS	FTP
2010 Quarter 4	B	3/15/2011 5:21:00 PM	FAILED	FTP
2010 Quarter 4	C	3/15/2011 5:37:00 PM	FORCED PASS	FTP

THE POWER OF COLLABORATION

HOME

NYU Langone Medical Center

NYU LANGONE MEDICAL CENTER
(MDCR PROVIDER # - 330214)
FOR PERIOD 10/01/2010 - 12/31/2010 VERSION : C
REPORT PRODUCED ON: 03/15/2011

EXECUTIVE SUMMARY

FAILURE LIST

REASONS FOR FAILURE - Too Many Exceptions

Field Name	Exception Message	Rejection Level (%)	Number of Exceptions	% of Exceptions
Individual Soft Scoring	Too many exceptions at field level.	--	--	--
			0	

WATCH LIST

MESSAGES WITH FREQUENCIES EXCEEDING UHC EXCEPTIONS TOLERANCE GUIDELINES

Field Name	Exception Message	Tolerance Level (%)	Number of Exceptions	% of Exceptions
PT OF ORIGIN (Admit Src)	ICD9 DX1=NEWBORN, POINT OF ORIGIN REASSIGNED NEWBORN	0.10	290	2.76
PT OF ORIGIN (Admit Src)	ICD9 DX1=NEWBORN, POINT OF ORIGIN NOT NEWBORN	0.10	127	1.21
PT OF ORIGIN (Admit Src)	INVALID, DEFAULT ASSIGNED	0.10	11	0.10
ADMIT STATUS	ICD9 DX1=NEWBORN, ADMIT STATUS NOT NEWBORN	0.10	127	1.21
			555	

NYU Langone Medical Center

Charge: "Solve the Data Quality Problem"

January 2011

- Co-chairs: Quality and Finance
- Information technology
- Health information management
- Patient registration
- Care management – discharge planning

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Principles

- Fix data quality at the source.
- Assign clear responsibility for acquiring high quality data at the source.
- Standardize data management routines.

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Our Work Continues

- Attention to data quality coincides with new enterprise-wide information system implementation
  - Just in time to effect data workflow redesign for new financial systems
- Not to mention: MEANINGFUL USE!

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What We Learned

- Importance of data workflow assessment and change management that includes all who touch the data, present and future.
- Importance of collaboration.
- Importance of data quality governance.

NYU Langone Medical Center

Cleveland Clinic

Enterprise Business Intelligence at the Cleveland Clinic

Eric D. Hixson PhD, MBA
Director, EBI Quality Data
Medical Operations, Business Intelligence

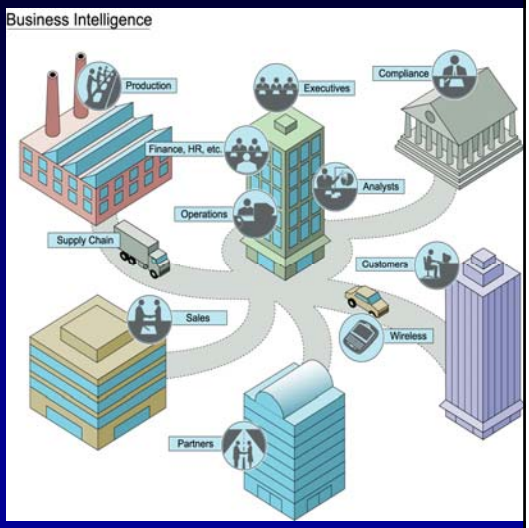
EBI Definition

Business Intelligence is an interrelated set of processes…

Enterprise Business Intelligence (EBI) is an *umbrella* term to describe a set of concepts and methods to improve business decision-making by *using information* in fact-based analytics

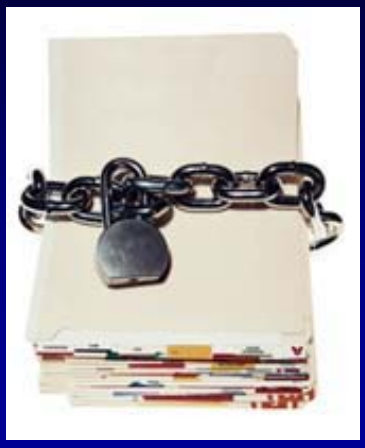
How EBI is used in Healthcare

- **Align departmental goals and objectives with strategic priorities**
- **Realize expense reductions goals by providing accurate and timely information**
- **Improve quality of care through monitoring & trending**
- **Document quality for consumer and provider use**
- **"If you can't measure it, you can't manage it" – Peter Drucker**

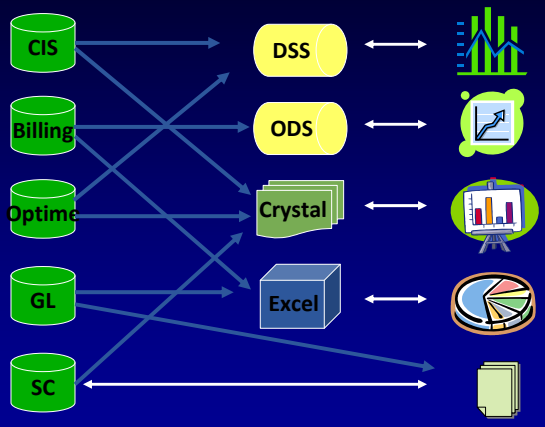


Operating Problems and Barriers

- Executive Sponsorship and Funding
- No Single Version of the Truth
- No Timely reporting of Information
- Difficulty managing Data Quality
- Multiple Clinical Systems, Patient Accounting Systems, Logistics, HR systems
- Increased Demand for Consumer Level Information
- Revenue cycle management
- Contract compliance with Managed Care payers and GPOs

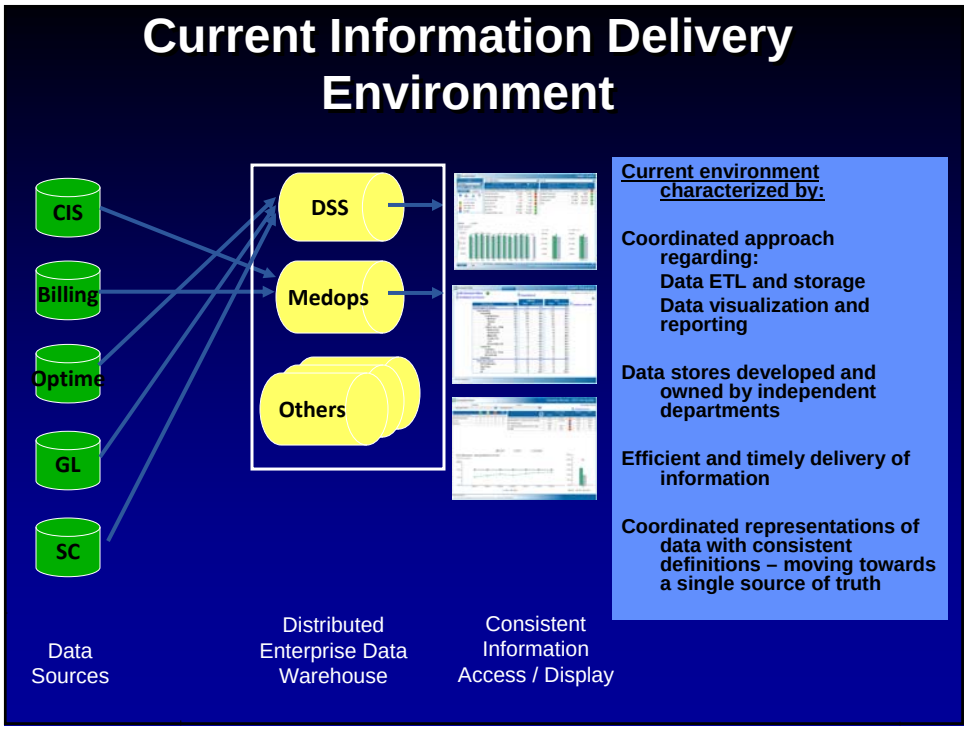


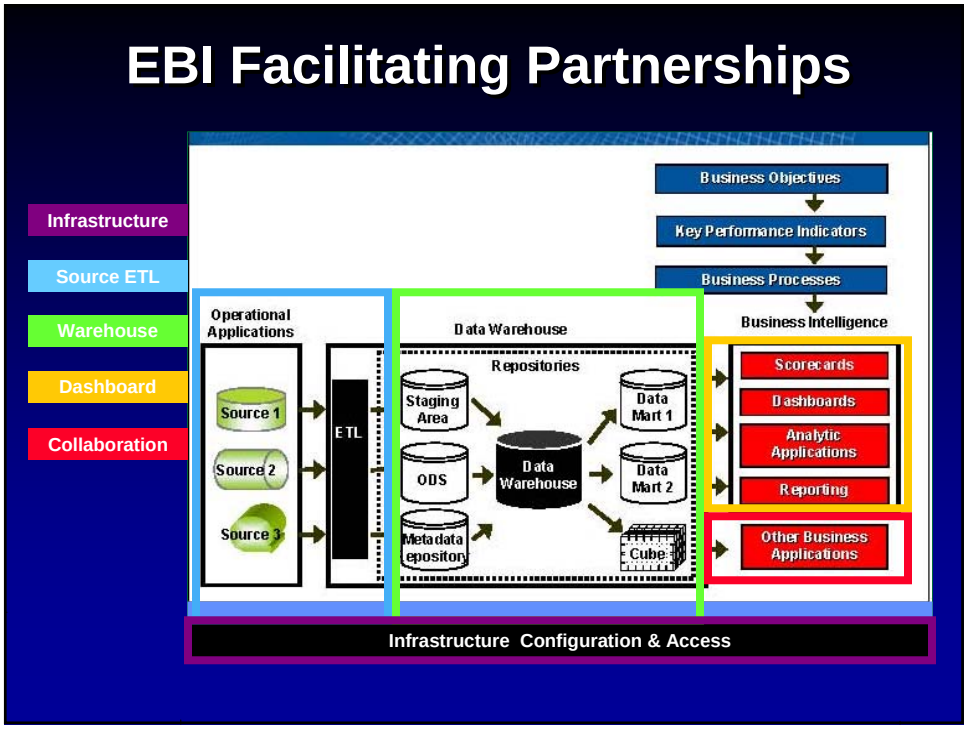
Information Delivery Environment Before EBI



Previous environment characterized by:

- Heavy reliance on packaged technology solutions with limited integration
- Data stores developed and owned by independent departments – duplicative and expensive
- Inefficient and untimely delivery of information
- Disjointed approach to information access & display (reports, online tools, excel, crystal, etc.)
- Multiple representations of data with inconsistent definitions – no single source of truth

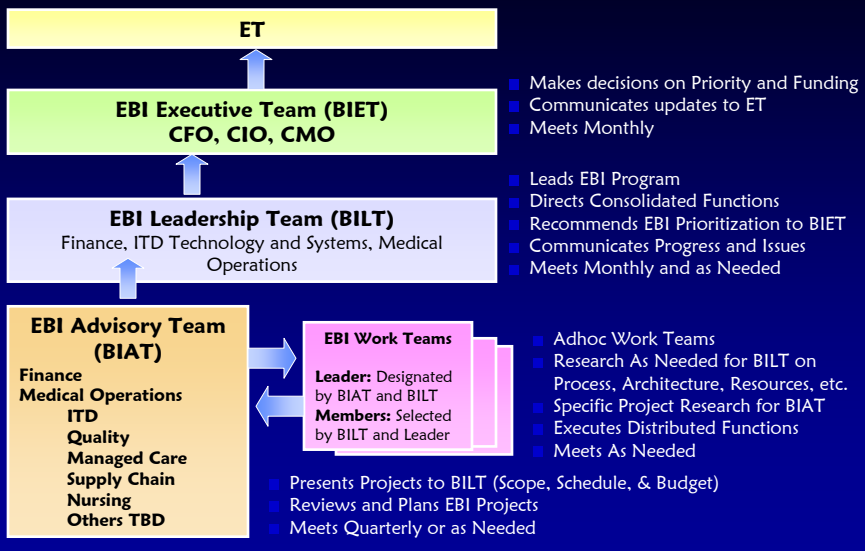

Current Information Delivery Environment
CIS
Billing
Optime
GL
SC
DSS
Medops
Others
Current environment characterized by:
Coordinated approach regarding:
Data ETL and storage
Data visualization and reporting
Data stores developed and owned by independent departments
Efficient and timely delivery of information
Coordinated representations of data with consistent definitions – moving towards a single source of truth
Data Sources
Distributed Enterprise Data Warehouse
Consistent Information Access / Display


EBI Facilitating Partnerships
Infrastructure
Source ETL
Warehouse
Dashboard
Collaboration
Business Objectives
Key Performance Indicators
Business Processes
Business Intelligence
Operational Applications
Source 1
Source 2
Source 3
ETL
Data Warehouse
Repositories
Staging Area
ODS
Meta data epository
Data Warehouse
Data Mart 1
Data Mart 2
Cube
Scorecards
Dashboards
Analytic Applications
Reporting
Other Business Applications
Infrastructure Configuration & Access

Current EBI Infrastructure

- Phase I implemented 2007
- SQL Server platform
- Business Objects presentation layer
- 18 TB data
- 40 FTEs
- 93% data load frequency ≤ weekly
- 6,000 total users, ~1k/week

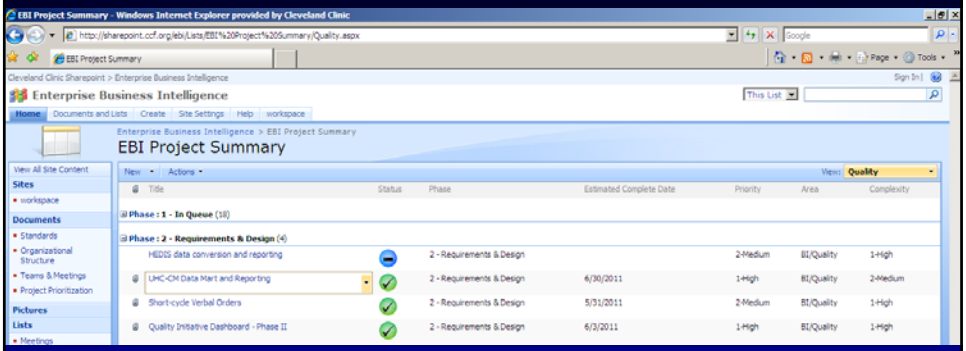
Governance Structure



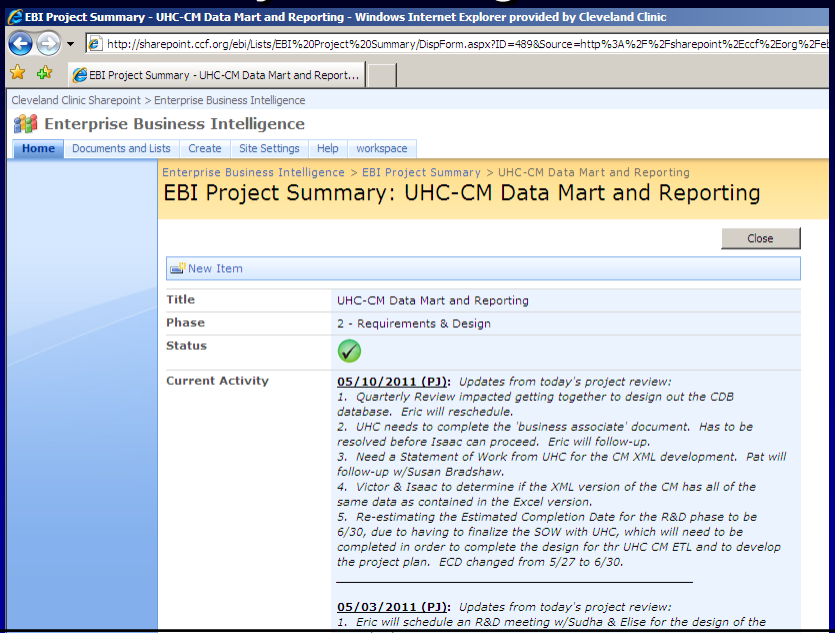
The Role of Executive Sponsor

- **Responsibilities include:**
  - **Drive Strategic Priorities**
  - **Embrace Key Performance Indicators Utilized**
  - **Provide Decision Making as Needed for Issue Resolution**
  - **Secure Funding and Resources**
  - **Espouse Operational Changes Based on Fact-based Findings**
  - **Executive 'Champion' of EBI**

Project Management



Project Management



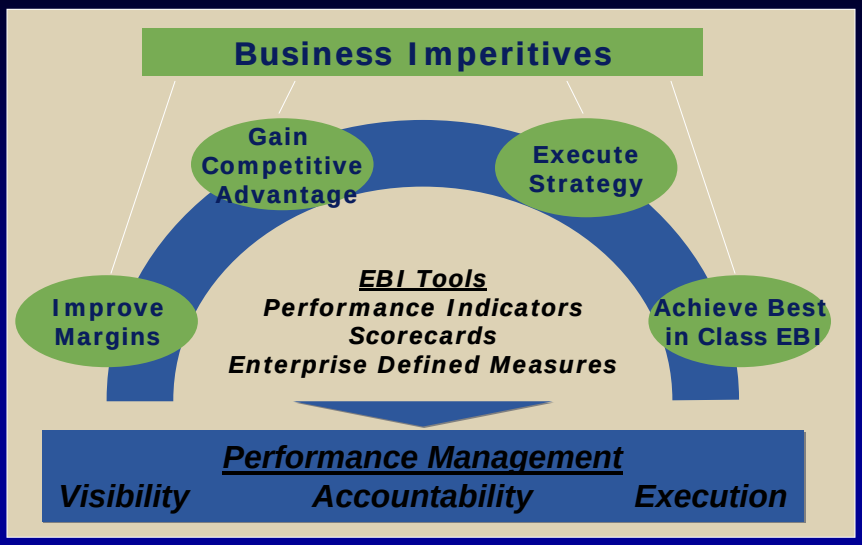
EBI Operational Principles

- 'Global', Enterprise Perspective
- Blend Consolidated and Distributed Services
- Resource Prioritization Based on Strategic Plan
- Maintain flexibility and adaptability
- Progress Measured by Business Impact
- Align Initiatives with *Customers* of Information
- Utilize Guidelines, Frameworks, and Metrics to Support Division-driven Projects
- Develop Culture and Community Around Information Sharing and Delivery
- Operational Model Includes Plan for Staff, Architecture, Life-Cycle Processes, and Governance

EBI & Performance Management

- **Executive Team**
  - Dashboard Reporting
  - Market Analysis
  - Competitor Information
  - High Level Service Line Profitablitiy
  - Summarized Operational Performance
  - Patient Satisfaction
- **Physician/Clinical Management**
  - MD-specific utilization & profitability
  - Peer Comparisons
  - Development of Critical Paths
  - Cost of Clinical Alternatives
- **Operations**
  - Patient level profitability
  - Average Daily Census
  - Staffing and scheduling information
  - Variable cost analytics
  - Department variance reports
  - Spend analytics
- **Quality Management**
  - Outcome Analysis
  - Severity of Illness Integration
  - Case Screening
  - Clinical outcomes
- **Finance / Accounting**
  - Budgeting Variance
  - Productivity Monitoring
  - Departmental Performance
  - Contract Compliance
  - Spend Analytics
  - Revenue Cycle Analytics
- **Managed Care**
  - Contract Negotiation/Pricing
  - Claims Management Support
  - Contract Management
  - Pay-for-Performance

EBI & Performance Management




Cleveland Clinic
Every life deserves world class care.