

Primary Care Physician Portal: Identifying, Managing, and Monitoring Patient Care

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Introduction

Assembling information from through out the Mayo enterprise produces reliable analysis and reporting on quality of care. Available to all physicians in the primary care setting, this secure portal, reports in a way that providers can use to help manage practice and improve systems. . Physicians can easily answer questions about their patient population or see their experience compared to divisional averages. Development of new practice models that enhance quality, service and efficiency can also be measured using these portal tools. The physician portal reporting is 100% web based with SAS® datasets at the back end. This paper will discuss the role level security, the data acquisition, the data display and future reporting and uses of the data.

Methods

A pilot project was developed to test the capabilities of the development environment, delivery of role based security, the acceptance of Web tools, the ability to deliver timely information and the methodology of using the SAS multi-dimensional database (MDDb) to display the data. The Family Medicine Practice at four separate locations was chosen for the demonstration project. Two practices in Rochester, MN and practices in two smaller towns, totaling 50 physicians and administrative personnel, were the first clients to use the system. A cross-functional team examined a variety of development

issues such as data sources, data definitions, levels of security, data analysis types, and style of display.

Discussion

Security

Role based security became the first obstacle that had to be overcome. Determining how to protect this important practice information and who should have access to what information was the most time consuming part of the project. Security is controlled by use of the Network ID and password to enter this web site. The user credentials are verified and a "user" object is placed into the user session. Encapsulated in the "user" object is the necessary business logic to provide a set of APIs to handle information about user, security and database connections on behalf of the user. The security backbone of the portal is driven by a database. In general, a person may have access to their practice information and blinded peer information. Physicians summarized data may be drilled down to the individual patient level. A practice leader may have access to all those they manage. An administrator would see all rolled up data, but may drill down to detail physician level but not the patient level detail. The many ways that the security is parsed is determined by the many roles of the users that the portal serves. This diverse group represents physicians, physician care teams, administrators, practice leaders, quality managers and supports initiatives as benchmarking, practice change, metrics and practice guidelines.

Display

With physician and administrative clients, the application had to be easy to use and intuitive. There would be little opportunity to offer training with client's busy schedules. A web application was our choice due to the familiar navigation style and wide use of the intranet at Mayo. Using a software usability-testing laboratory, we were able to verify this decision to deploy with little training. Various forms of help are available to explain the components to the clients. Overall help is available with definitions and descriptions of the rational of the system. A "tour" is available to help demonstrate the navigation. Tool tips or "mouse over" tips are found almost everywhere with short explanations or even the formulas that were used in the cell calculation. Definitions describing the rational used to transform the data are available on a "drop down" button on each high-level display table. (Figures 1-2)

Data sources

With mountains of data electronically stored at the Mayo Clinic, the best sources for the data needed to be identified. Data was found in Excel spreadsheets, relational databases, proprietary systems, and data warehouses. Operational systems accessed included appointment systems, patient registration and billing systems requiring development of multiple interfaces. In the prototype, approximately 150,000 primary care, evaluation and management visits over a one-year period initialized the datamart. As more physician sites are added with more procedures and laboratory results, these numbers quickly increase. (Figure 3.)

In the final plan, more sites and physician groups are to have timely information with data quality being essential. The process makes use of SAS procedures and formats for accessing, verifying, cleaning and scrubbing to transform the data into usable information. (Figure 4.)

Data Analysis

The three major sections of the application are patient visit statistics and analysis for a physician within a particular time frame, and the demographics and characteristics of all the patients for whom the physician is the primary care provider. Patient management alerts enable the physician to identify patients needing special attention. Metrics for site selected benchmarks are reported monthly with comparisons to a target. Practice overview data are summarized in a multi-dimensional database for faster access. Statistics are shown in an interactive Java applet with a bar, pie, scatter or overlay chart of user's choice through the web interface. Each chart segment can be dynamically drilled down into a variety of user defined hierarchies. Any state in a defined hierarchy can be seen in a detailed form and downloaded into an Microsoft® Excel or .CSV file. An example of a top-level hierarchy may consist of the entire patient population distributed over the age groups in a bar chart. If all the visits were distributed over all diagnoses in the next hierarchy, any double click on a particular age group bar would take the user into a bar chart of the patients distributed over all possible diagnoses within that particular age group. The application allows physicians to compare their practice with the average practice of the rest of the department. Patient management, disease management and preventative service reminders are all available to the physician as the application logic is placed on the data. Inspecting detailed data is possible through the drill-down capabilities. Statistics at the department level are available to both physicians and administrators.

Conclusion

Demonstrations of the prototype met with and overwhelming positive response from administrators and department leaders.

Opportunities sought are to build a system of "best practices" and measure the change. Identify and then engage patients in their ongoing care--move from passive to active model of care.

The Physician Patient Management solution collects, analyzes, and communicates the

information needed to meet today's health care challenges. It delivers the information that was once locked in operational systems cleaned, summarized and transformed into meaningful data.

Figures 1-4
Metrics Panel

Measure	Notable	Provider	Division	Target
The Needs of the Patient Come First				
Access	Percent of patients seen in a given panel who sought primary care who were seen by their primary physician (or provider team)	67% (77%)	61% (75%)	70%
Quality	Percent of Specific Eligible Preventive Services Realized			
	a) Colon Screening	73%	78%	90%
	b) Immunization - Adult			
	- Influenza	49%	54%	90%
	- Pneumonia	37%	46%	90%
	- Tetanus	36%	34%	90%
	c) Immunization - Child			
	d) Lipid Screening	90%	94%	90%
	e) Mammography	75%	75%	90%
	f) PAP Smear	89%	87%	90%
Patient Satisfaction	Diabetes - Percent of Panel Members with HbA1c < 8%	80%	85%	80%
	Hypertension - Percent of Panel Members < 140/90 BP	89%	89%	80%
	Average Overall Satisfaction Score			
	Percent Definitely Would Recommend			
Right Care, Right Place, Right Time				
Specialist Referrals	Referral for Initial Specialist Consult Per 1000 Members Per Year	340	369	
	Specialist Utilization Per 1000 Members Per Year	2,979	3,009	
UCC / ED Utilization	Urgent Care Center Visits Per 1000	271	303	
	Emergency Department Visits Per 1000	287	230	111
Expense Management				
Expense Per Member Per Month	DSS Cost Per Panel Member Per Month (DSS Fee)	\$326 (\$366.1)	\$372 (\$447)	\$147
	Total Per Member Per Month (PMPM)	\$520.80	\$597.15	\$260
Lab Use	Lab Tests Per 1000	11,865	12,176	2870
	Lab Expense Per Member Per Month	\$40.57	\$44.70	\$15.25
Radiology Use	Radiology Tests Per 1000	2,413	2,278	630
	Radiology Expense Per Member Per Month	\$59.77	\$44.17	\$11.65
Formulary Use	Prescriptions Per Member Per Year			
	Percent Generic and Preferred Over Total			
	Prescriptions Expense Per Member Per Month			
Panel Size				
Panel	% Employees/dependents unenrolled			
	# of Employees/dependents in panel	250	11,193	
	% Employees/dependents in panel	28%	28%	
	Weighted Panels Adjusted by FTE			

Pull down data definitions

Panel	Physician	Specification	Panel Group	Rate	Help
1	1	1	All Panel Groups	All Data	1

Specification	Head Count	Eligible	Realized Care	Target	Realized Care (%)	Target Care (%)
1 Bone Density (Hip Fracture)	1	1	0%	0%	22%	143
2 Bone Density (Osteoporosis)	27	72	62%	60%	50%	1,204
3 Colon Cancer Screening	145	400	64%	60%	73%	3,857
4 Colonoscopy	13	45	70%	70%	78%	584
5 Echo	18	87	73%	70%	74%	378
6 Immunization - Influenza	96	150	39%	30%	47%	3,421
7 Immunization - Pneumovax	97	188	39%	30%	42%	3,746
8 Immunization - Tetanus	430	716	40%	30%	59%	16,004
9 Lipid Screening	71	462	69%	60%	69%	1,779
10 Mammography	72	280	78%	70%	78%	1,878
11 PAP Smear	80	306	73%	65%	78%	1,505

Service Specification Definitions	
Bone Density (Hip Fracture)	Anyone 50 years or older with a hip fracture and without a bone mineral density test in last 2 years
Bone Density (Osteoporosis)	Anyone with osteoporosis and without a bone mineral density test in last 2 years
Colon Cancer Screening	Anyone between 50 and 80 years missing within the last 5 years colonoscopy, flex, and barium tests and within the last year 3 FOBT tests
Colonoscopy	Anyone with colon polyps or history and without a colonoscopy done in last 3 years
Echo	Anyone with Valvular Heart Disease (aortic stenosis, mitral regurgitation, and others) and without an Echo done in last five years
Immunization - Influenza	Anyone between 65 to 80 without an influenza immunization in last 2 years
Immunization - Pneumovax	Anyone between 65 and 80 without any pneumovax immunization
Immunization - Tetanus	Anyone between 18 and 80 without a tetanus immunization in the last 10 years
Lipid Screening	Any female 45 to 75 or male 35 to 75 without an HDL or total cholesterol determination in last 5 years
Mammography	Any female 50 to 75 without a mammography done in last year
PAP Smear	Any female between 18 and 65 without a PAP Smear in the last 3 years excluding those with hysterectomy non due to cervical cancer

Graphical Comparisons

Patient Navigation Report - November 2007

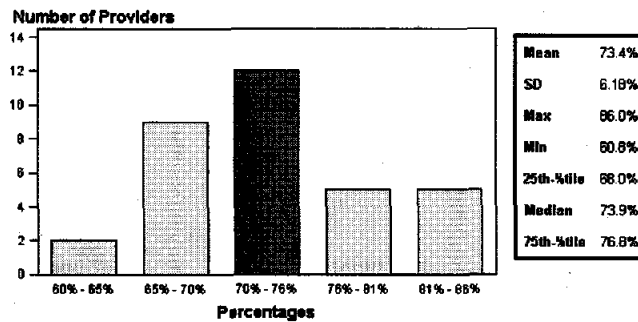
Dept: Physician Specification: Mammography Payer Group: All Payer Groups Chart: Bar Graph Help

Summary Patient View Division

Read Me:

Division Distribution for Mammography

Dr. [REDACTED]'s Percent = 74.8% in Blue



Statistic and Graph for Providers with 20 or More Eligible Patients

Costs and visit comparisons

Patient Resource Utilization - November 2007

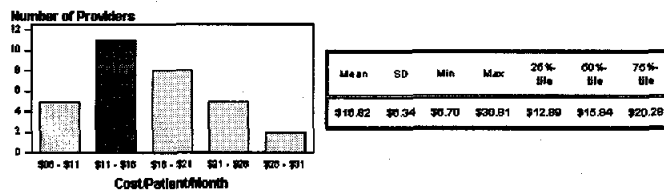
Dept: Physician Point of Service: Emergency Room Time Frame: Last 1 Month Chart: Bar Graph Qualifier: Help

Summary Patient View Division

Read Me:

Division Distribution for Emergency Room

Dr. [REDACTED]'s Cost Rate=\$12 in Blue



Dr. [REDACTED]'s Events Rate=0.18 in Blue

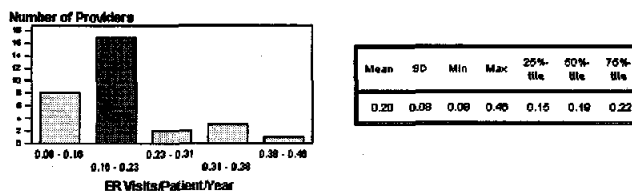


Figure 5

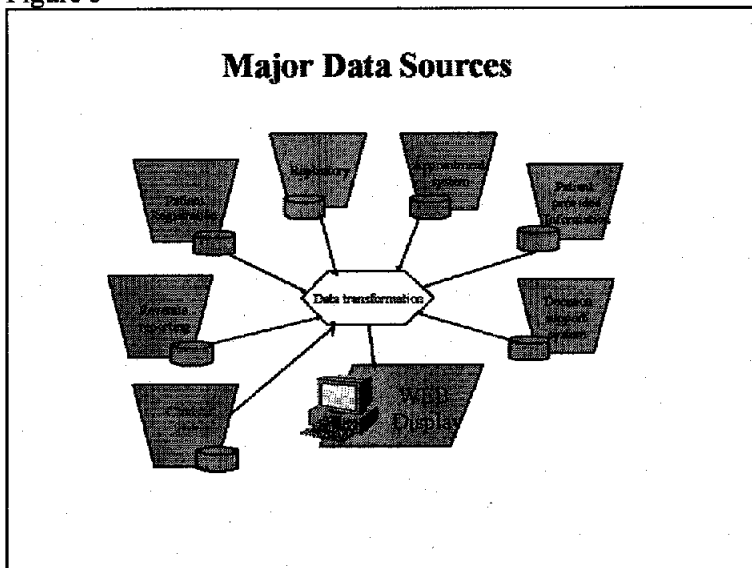
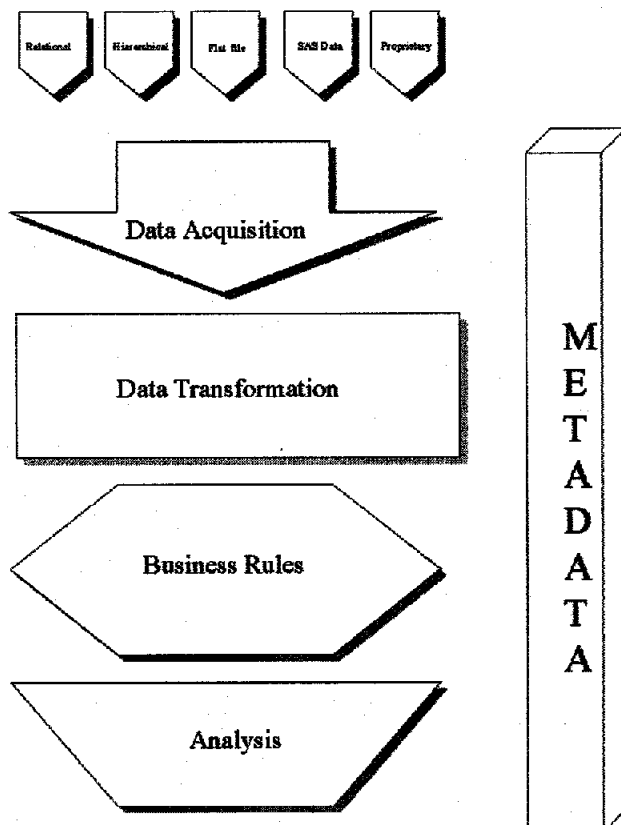


Figure 6



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