



HealthInfoNet – The Health Information Exchange Value Added Activities to Support Health Reform and Pharmacies in the Future

University of New England School of
Pharmacy: Dr. Douglas H. Kay
Continuing Pharmacy Education
Symposium: June 11, 2014

Topics To Be Covered

- HealthInfoNet Overview and Exchange Updates
- HealthInfoNet Value-Added Activities
- Introduction to the HealthInfoNet Data Warehouse
- HealthInfoNet Data Use and Release Policy
- State Innovation Model Grant
- HIE and the Pharmacy
- Discussion

About HealthInfoNet

- A private independent nonprofit HIT organization funded by both private and public sources.
- Operates the statewide HIE in Maine – A query-based centralized HIE model – live in January 2009
- Statewide Regional Extension Center
- SIM Testing Grant Partner
- Additional Services: HIT Convening/MU Support, Patient Identification, VNA, ADT Notifications, ACO Data Management, Analytics

What is the HIE?

- HealthInfoNet operates Maine's **statewide health information exchange (HIE)**, a secure, standardized electronic system where providers can share important patient health information.
- The use of this system:
 - Saves time and reduces paperwork.
 - Facilitates more informed treatment decision-making.
 - Leads to improved care coordination, higher quality of care, and better health outcomes.

Maine's HIE History

- **2004** - Maine Health Access Foundation, Maine CDC, Maine Quality Forum and Maine Health Information Center study need and support for an exchange in Maine.
- **2005** - Stakeholders begin planning and development.
- **2006** - HealthInfoNet incorporated with Devore Culver, formally Chief Information Officer of Eastern Maine Healthcare, as Executive Director.
- **2008** - Demonstration phase begins.
 - Participants included MaineHealth, Central Maine Healthcare, Eastern Maine Healthcare, Maine General Health, Martin's Point Health Care, Franklin Memorial Hospital and the Maine CDC.
- **2010** - Demonstration phase ends and statewide HIE roll-out begins.

How Does the HIE Work?

- HealthInfoNet's system combines information from separate health care sites to create a **single electronic patient health record**
- Patient health information is **automatically uploaded** from a provider's electronic medical record system
- The information is **standardized and aggregated** across care sites
- Clinicians can seamlessly access their patient's information in HealthInfoNet **from within their EMR**
- HealthInfoNet **automates reporting** of certain illnesses and conditions like Lyme disease or food poisoning, to public health experts at the Maine CDC

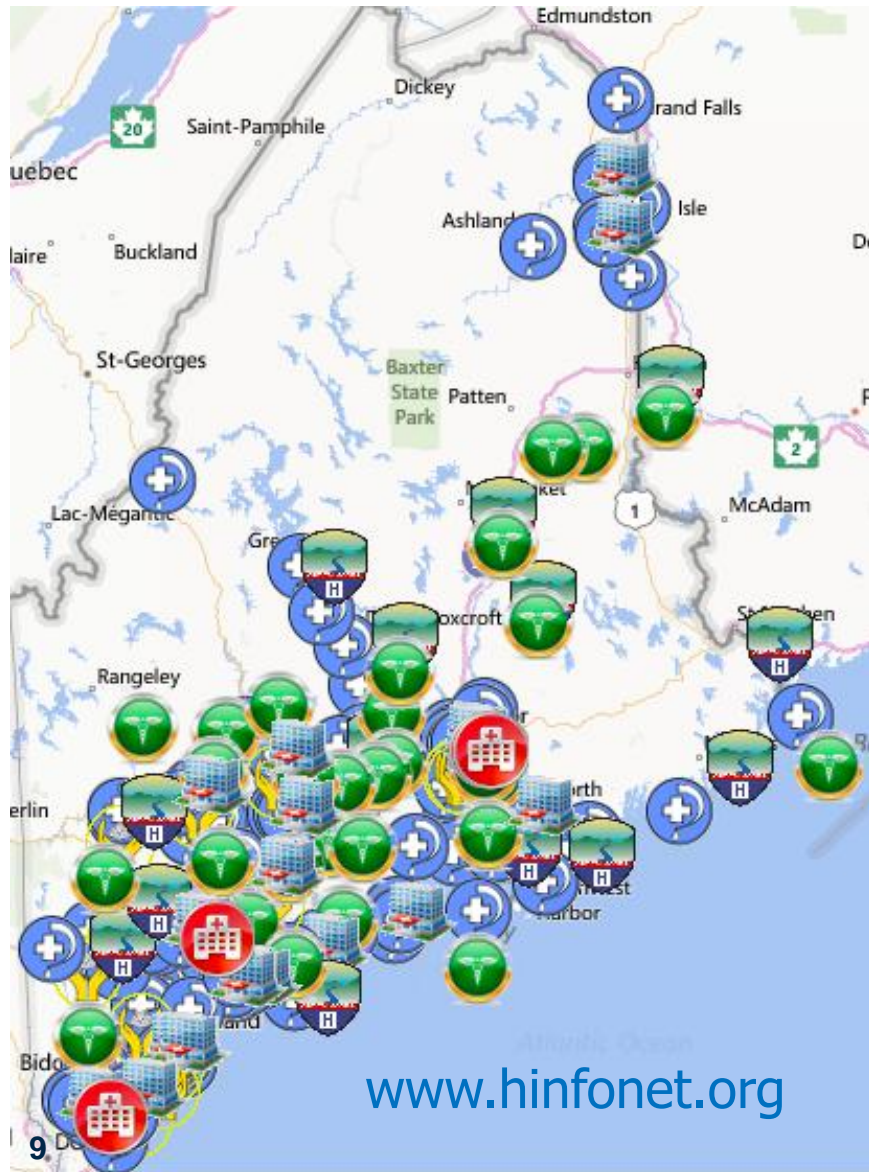
Data Categories Managed in HIN Today

- Patient Identifier and Demographics, including insurer
- Encounter History
- Laboratory and Microbiology Results
- Radiology Reports
- Adverse Reactions/Allergies
- Prescription Medication History (claim/fill – incomplete!)
- Diagnosis/Conditions/Problems (primary and secondary)
- Immunizations
- Vital Signs
- Dictated/Transcribed Documents
- Continuity of Care Documents (CCD)

What do providers say about using the HIE?

- **It's more efficient.** Automated sharing of information, less paperwork, reduced time to access clinical information at the point of care, fewer repeat tests and procedures.
- **Results in more Informed treatment decisions.** A more complete and up-to-date patient medical record, including information from all a patient's participating health care providers.
- **Leads to healthier patients.** Fewer medical errors, improved patient safety, improved continuity of care, and better patient outcomes.

HIE Connections



- 34 of 37 hospitals (all under contract to connect in 2014)
- 34 FQHC sites
- 400+ ambulatory sites including physician practices behavioral health and long term care facilities



HIE Population Statistics

As of April 31, 2014

- **1,326,691** lives in the HealthInfoNet database
- **1,174,795** Maine residents have clinical data in the exchange (88% of Maine's resident population)
- **15,450** individuals have opted out (1.2%)
- **2,049** Maine clinicians and support staff are active users of the exchange
- **60%** of active users accessed the exchange in April, 2014

HIE Operating Statistics

As of April 31, 2014

- **Over 13 Million** inbound messages are received by HealthInfoNet each month
- **157,820** patient clinical messages sent monthly in support of ACO organizations in Maine
- **61,088** data transmissions sent monthly to Maine CDC in support of Electronic Lab Reporting, Syndromic Surveillance and Immunization Reporting (Meaningful Use Measures)
- **21,164** patient lookups performed each month
- **9,800** Continuity of Care Documents (CCD) sent monthly for discrete data integration into EHR applications
- Over **8,000** real time notifications sent each month
- The HealthInfoNet Central Data Repository (CDR) is **2.34 TB** in size and is growing at **4 GB** a day

What Does the System Look Like?

HIN TEST - Alfreds, Shaun

maine.test.hinonet.org/concerto/Concerto.htm

HINMERCY HINTEST DEMO (F / 59 years)

Showing all documents

View By Category Look For Status All Clear

HINTEST, DEMO

Identifiers

- Maine Medical Center*HINMMC
- Eastern Maine Health Systems (EMHS)*HIN1234
- St. Joseph Hospital*HINSJH
- Central Maine Medical Center*HINCMC
- Cary Medical Center*HINCARY
- Martins Point Health Care*MPDEMOHINTEST
- Wilson Stream Family Practice*HINWSFP
- Wilson Strea

Emergency Contact

Name CATHY ADMTEST

Demographics

Sex Female

Date of Birth Sep 11 1952 (59 years)

Address 125 PRESUMPSCOT ST
PORTLAND ME 04103

Phone (207)541-9250

Primary Care Provider

Name Miller Karl

Active Problems

Code	Description	Status	Onset Date	Location
718.55	Ankylosis of joint of pelvic region and thigh		02/06/2012	EMHS
716.25	Allergic arthritis involving pelvic region and thigh		02/06/2012	EMHS
788.1	Dysuria		02/06/2012	EMHS
596.0	Bladder neck obstruction		02/06/2012	EMHS

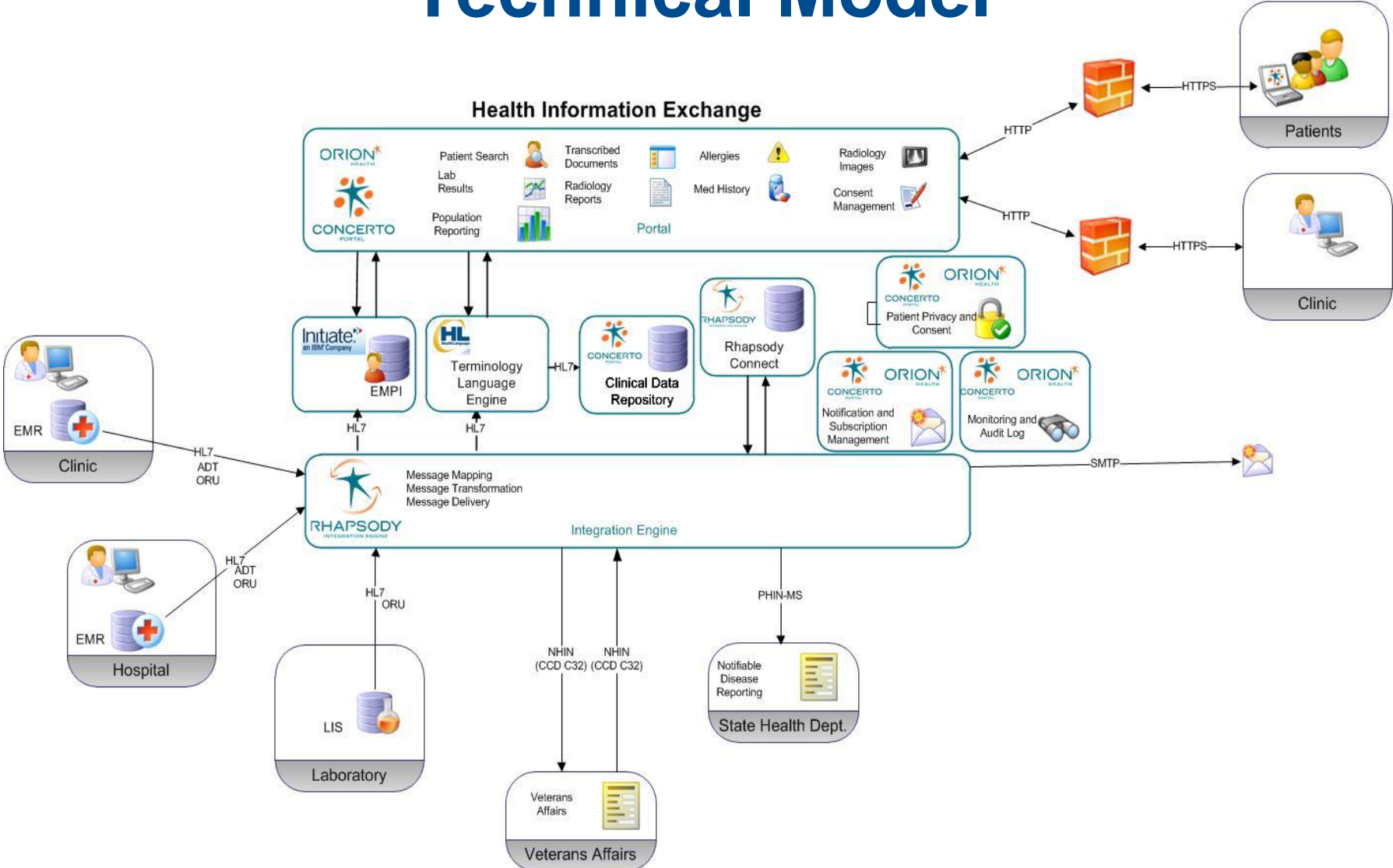
Allergies

Details	Reaction	Severity	Date Entered	Location
Azithromycin	HIVES	MI	09/09/2011	CARY
Azithromycin	Hives	Mild	05/19/2011	SJH
Pollen	sneezing, wheezing, watery eye	Intermediate	05/19/2011	SJH
ALTEPLASE	RASH	Severe	03/07/2011	EMHS
No Known Allergies			02/18/2011	MMC

Prescription Medications (Non-Medicaid)

Date Dispensed	Drug Name	Dose	Qtv	Refill	Prescribed By	Pharmacy	Instructions
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Technical Model

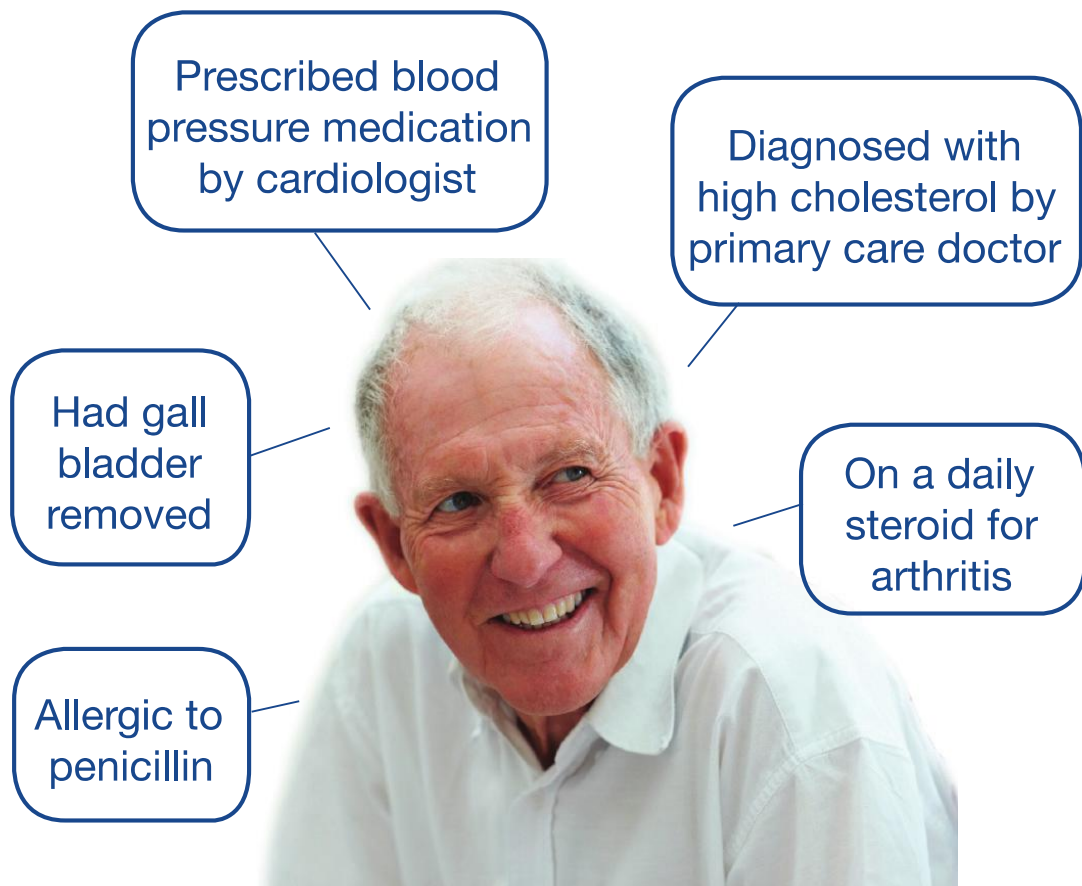


Core Exchange Services

- Interface Development, Management and Support
- Data Mapping and Standardization
- Patient Centered Portal Access and Data Download Functionality
- Real Time Event Notification

Why Patients Care

- Care is more coordinated.
- Less duplicate tests and procedures.
- Less paperwork.
- Fewer errors and safer care.
- Lower out-of-pocket costs.



Using HealthInfoNet, Bob's health care providers can see all of the information listed above in one secure electronic location.

HIE Participant Agreement

- Each participant retains ownership of its own data
- PHI use is restricted to supporting treatment between point of service and public health
- Each participant is responsible for user authorization, access monitoring and sanction management
- HealthInfoNet serves as agent for participants in managing consumer opt-out process

HIE Security Processes

- Uses a Virtual Private Network (VPN), not connected to the Internet and protected by a dedicated Firewall
- All users are given unique passwords and can only access the system from their organization's EHR.
- Data is encrypted at all times (in motion and at rest) and stored separately from clinical data.
- Provider activity logs are audited daily by HealthInfoNet staff and access reports can be generated at any time.
- Users must confirm they have a relationship with the patient and a need to see their information. This is recorded in the system.

Privacy and Consent Policies

- Maine follows opt-out consent policy designed in 2007 with input from stakeholders representing patients, providers, employers, payers, and government.
- Consumers opt-out online, through mail, or over the phone.
- Consumers opt-out once for all care locations at which time their clinical data is deleted, not just hidden.
- State law requires participating providers give the patient a state-approved form the first time they visit that provider location.
- 2011 State law modified to provide for opt-in of mental health and HIV data.

HealthInfoNet Value Added Services

- Meaningful Use Stage 1 & 2 Connection to Public Health for Laboratory Reporting, Syndromic Surveillance, Immunization Reporting
- ACO/Value-Based Purchasing Data Source
- Vendor Neutral Architecture Image Repository
- Enterprise Master Patient Index Management
- Interoperable Secure Messaging
- Analytic and Reporting Tools

Meaningful Use Stage 1 & 2

- Standardized, Structured Electronic Lab Result Reporting to Maine CDC for Positive Values Associated with Mandated Disease Reporting
- Adult Immunization Reporting to Maine's IMMPACT II Immunization Registry
- Syndromic Surveillance Reporting to Maine CDC

ACO/Value-Based Purchasing Data Supplier

- Data Source for NNEACC (ADT & Lab) for MaineHealth & Bangor Beacon LLC ACO Patients
- Monthly ACO EMPI File for Bangor Beacon LLC
- Data reporting requests

Vendor Neutral Architecture Image Repository

- Statewide Repository for Managing Digital Archive Images (Radiology, Cardiology, etc.)
- Reduced Total Cost of Operation for Image Management Through Statewide “Group Purchase” Strategy
- Enhanced Access to Relevant Prior Examinations to Support Reduced Testing Redundancy
- Increased Leverage with PACs Vendor
- Strengthened Business Recovery Position

Enterprise Master Patient Index Management

- Supports Resolution of Patient Identity Across An Enterprise Where Different Medical Record Numbers Are Used to Manage the Same Patient
- Delivers and Maintains a Unique, Single Enterprise Patient Identification Number for Better Coordination of Care Management, Billing, Data Integration

Interoperable Secure Messaging

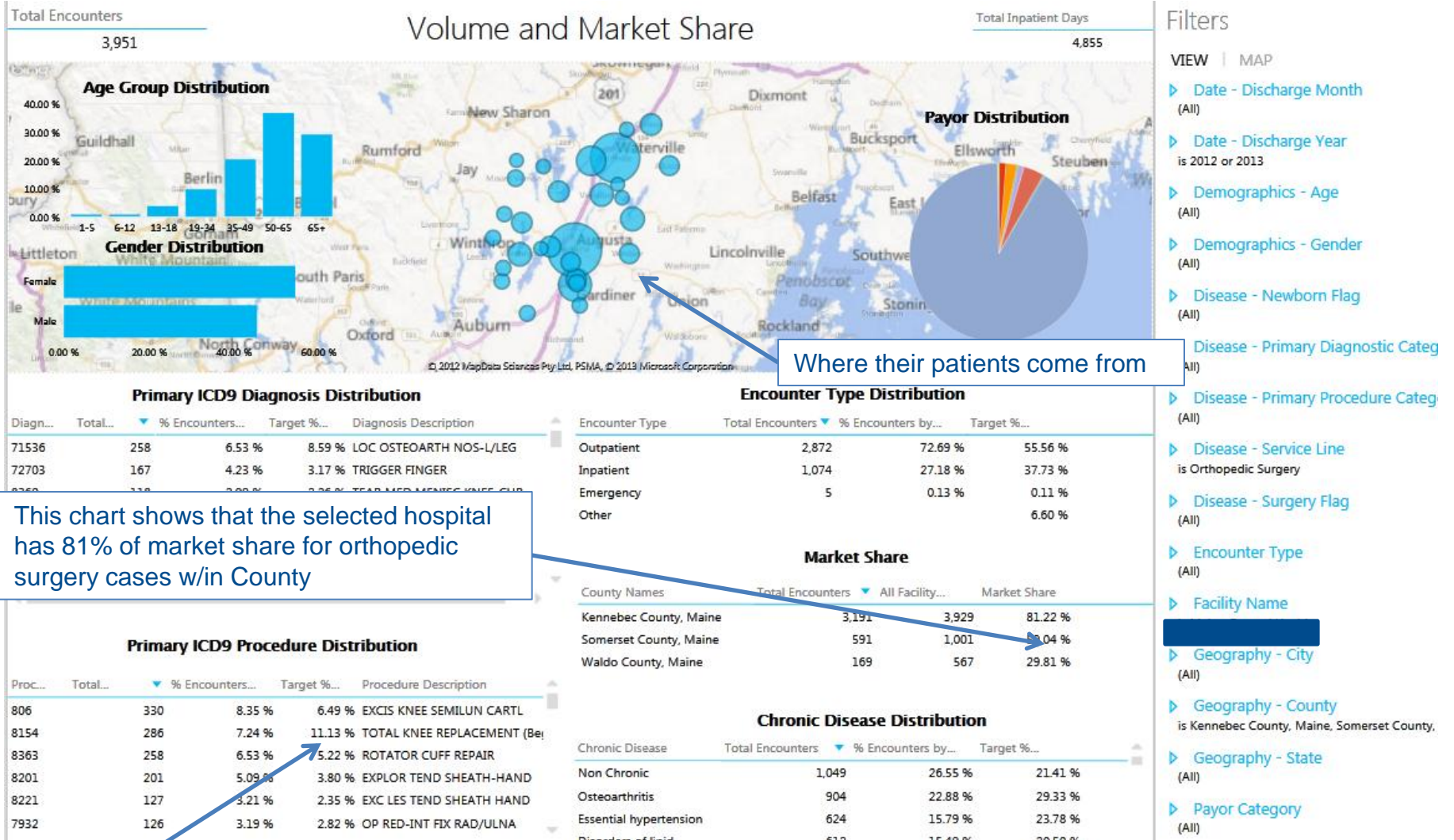
- Connects Hospital and Physician Practices to The National Health Information Network (NwHIN) to Support Secure, Trust-Based, “Push” Exchange of Clinical Information
- Provides Access to Registries of “Authenticated” NwHIN User e-Mail/Secure Messaging Addresses
- Supports Secure Exchange of Clinical Information Across State Lines
- Low Annual Fee of \$144 per User Account

Data Warehouse and Reporting Tools

- Leverage Transactional Data Flowing Into the Exchange to Support Quality and Population Health Analysis as well as State, Federal, and Health Plan Reporting
- Near Real Time Data Set to Support Market Share Analysis, Patient Origin Studies, etc.
- Foundation for Community-Wide Health Reform Reporting
- Near real-time clinical risk profiling
 - Readmission
 - Inpatient Utilization
 - ER Admission
 - High Cost

HIN Analytic and Reporting Dashboard Views

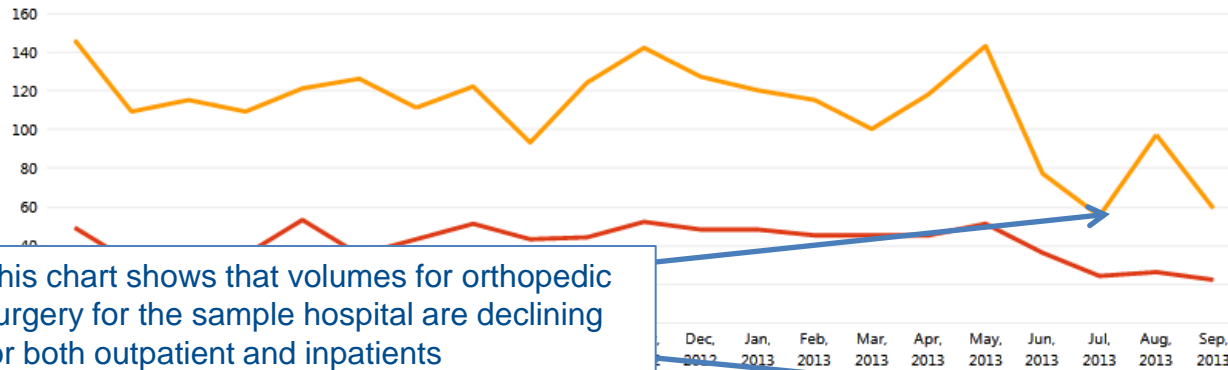
Volume and Market Share Dashboard



Volume and Market Share Trending

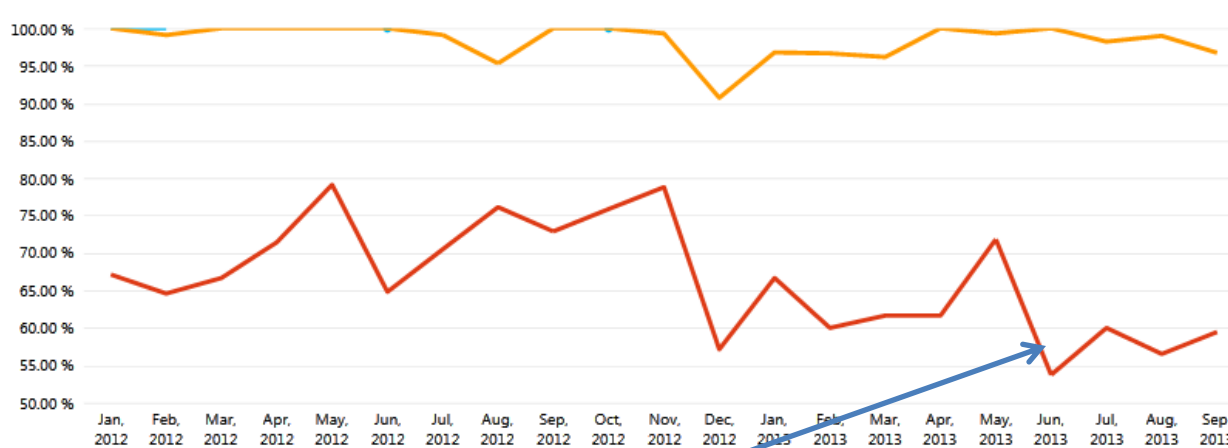
Volume and Market Share Trend

Total Encounters by Discharge Month, and Encounter Type



This chart shows that volumes for orthopedic surgery for the sample hospital are declining for both outpatient and inpatients

Market Share by Discharge Month, and Encounter Type



and market share for inpatient orthopedic surgery within their service area is declining.



Filters

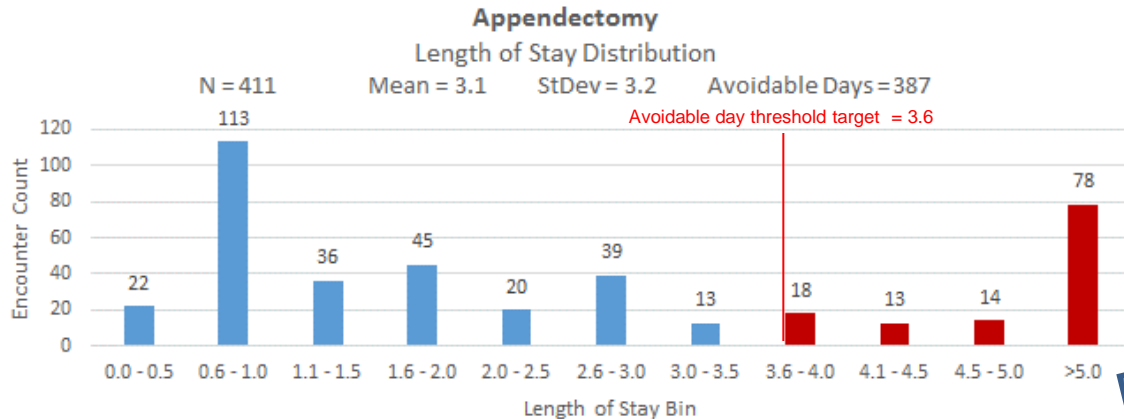
VIEW

- ▶ Date - Discharge Month (All)
- ▶ Date - Discharge Year is 2012 or 2013
- ▶ Demographics - Age (All)
- ▶ Demographics - Gender (All)
- ▶ Disease - Newborn Flag (All)
- ▶ Disease - Primary Diagnostic Category (All)
- ▶ Disease - Primary Procedure Category (All)
- ▶ Disease - Service Line is Orthopedic Surgery
- ▶ Disease - Surgery Flag (All)
- ▶ Encounter Type (All)
- ▶ Facility Name
- ▶ Geography - City (All)
- ▶ Geography - County is Kennebec County, Maine
- ▶ Geography - State (All)
- ▶ Payor Category (All)

Encounter Type
— Emergency
— Inpatient
— Outpatient

Encounter Type
— Emergency
— Inpatient
— Outpatient

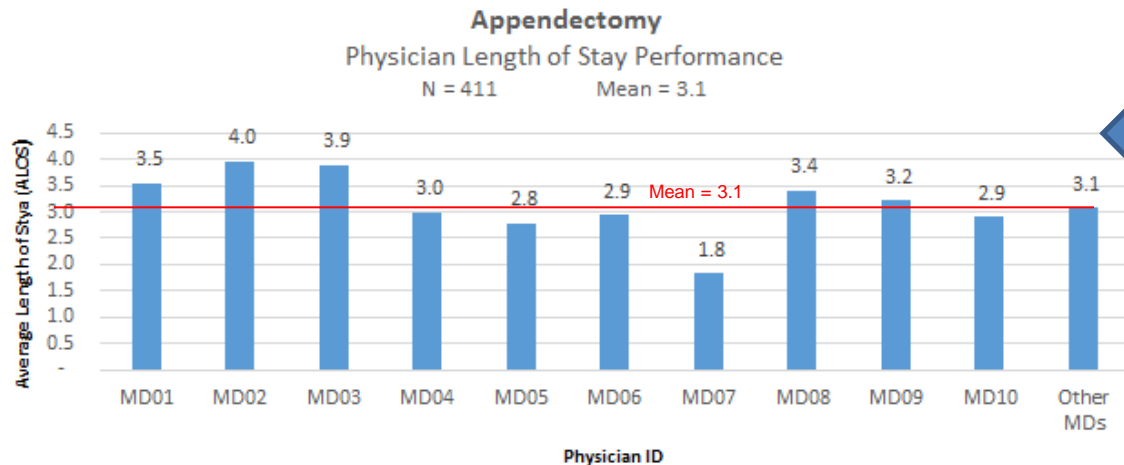
Variation Management: Length of Stay



The Variation Management module combines HIN HL7 data with Hospital billing data.

Variation is measured across length of stay, total cost, resource costs (laboratory, radiology, pharmacy, etc), and orders depending on the availability and integrity of the data.

The modules show overall performance, as shown by a distribution chart with threshold targets. The targets are set based on the amount of variation present.



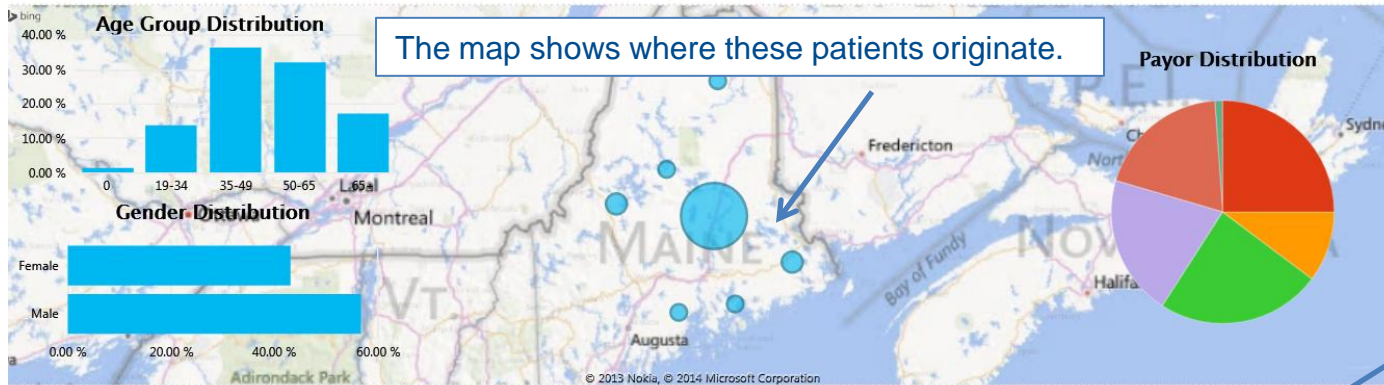
Physician performance is also measured to determine if the variation is partly physician driven

Readmission Risk Management Dashboards: Readmission Risk Profile

Total Inpatient Encounters

31,195

Readmission Risk Profile



The map shows where these patients originate.

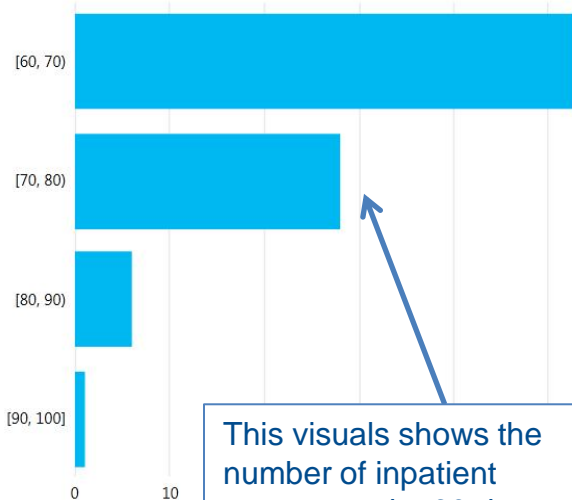
Filters

VIEW | MAP

- ACO (All)
- Date - Admission Month (All)
- Date - Admission Year is 2013 or 2014
- Date - Discharge Month
- Disease - Newborn Flag (All)
- Disease - Primary Diagnostic Category (All)
- Disease - Primary Procedure Category (All)
- Disease - Service Line (All)
- Disease - Surgery Flag (All)
- Facility Name
- Geography - City (All)
- Geography - County (All)

These charts show distribution of patients by chronic disease, service line, and diagnostic category

Risk - Inpatient 30 Day Readmission



This visual shows the number of inpatient encounters by 30 day readmission risk level.

Chronic Disease Distribution

Chronic Disease	Total Encounters	% Encounters...	Target %...
Non-ChronicDisease	58	65.91 %	60.68 %
Essential hypertension	25	28.41 %	24.66 %
Other nervous system...	25	28.41 %	23.69 %
Coronary atherosclerosis and...	21	23.86 %	19.90 %

Service Line Distribution

Disease - Service Line	Total Encounters	% Encounters...	Target %...
Unknown	66	75.00 %	70.87 %
Medical - circulatory system...	5	5.68 %	7.38 %
Medical - digestive system...	3	3.41 %	4.47 %
Medical - endocrine and...	2	2.27 %	2.62 %

IP Encounter Distribution - Primary Diagnosis Category

Disease - Primary Diagnostic...	Total Encounters	%...	Target %...
Abdominal pain			0.29 %
Acute and unspecified renal failure			0.49 %
Acute cerebrovascular disease			0.29 %

Readmission Risk Management Dashboards: Readmission Risk Patient List

Multiple filters to retrieve a patient encounter list and associated risk scores

Admission Date From <input type="text" value="2/19/2014"/>	Admission Date To <input type="text" value="3/5/2014"/>	Discharge Date From <input type="text"/>	Discharge Date To <input type="text"/>	Gender <input type="text"/>	Sort Direct <input type="text" value="Descending"/>
Patient First Name <input type="text"/>	Patient Last Name <input type="text"/>	Patient MRN <input type="text"/>	Age Group <input type="text"/>	ZIP <input type="text"/>	
Payor Category <input type="text"/>	State <input type="text"/>	County <input type="text"/>	City <input type="text"/>		
Readmission Risk Score <input type="text"/>	Facility <input type="text"/>				

Apply Filters

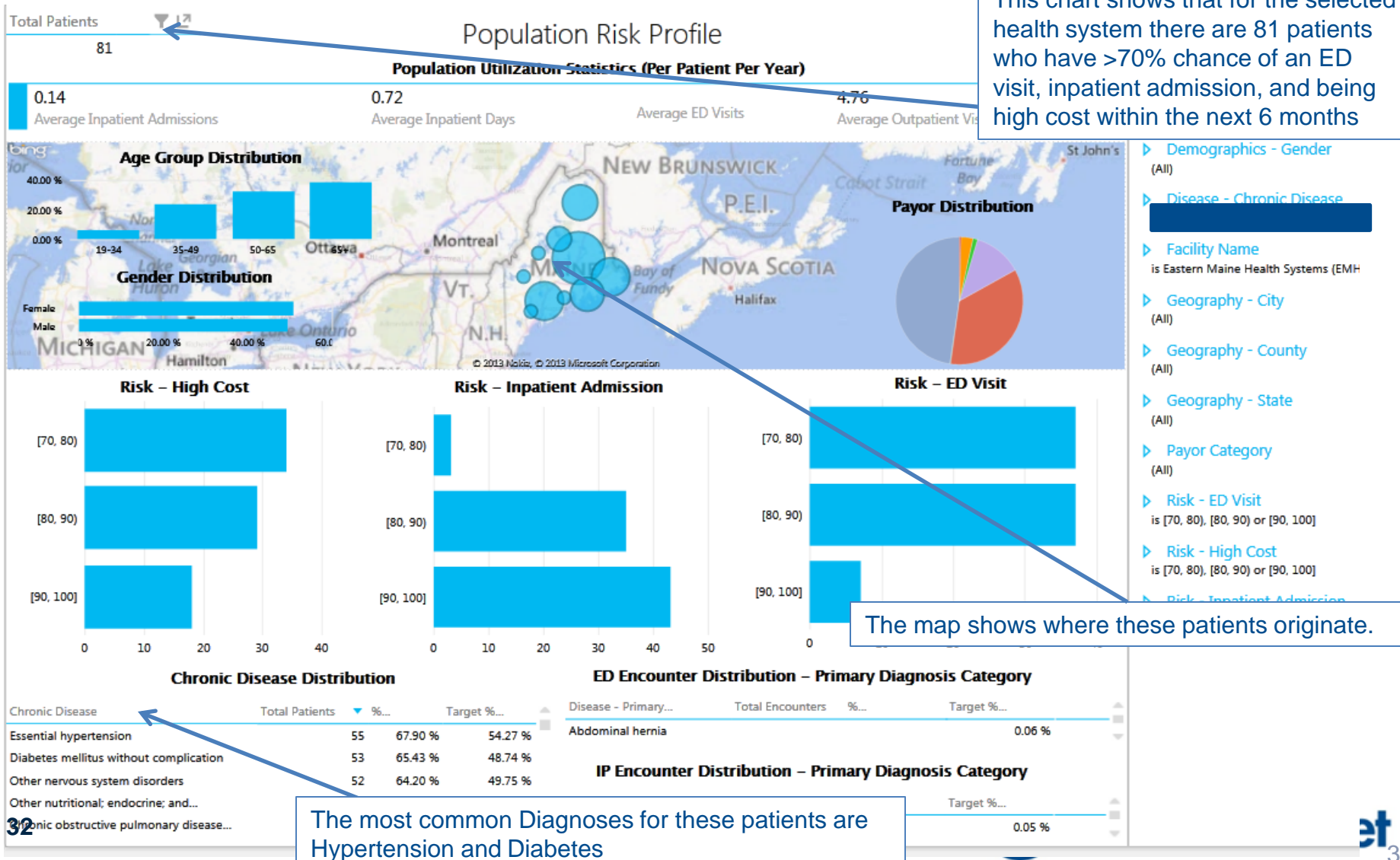
Facility: HBI Admins

Total Patients	Total Inpatient Encounters
804	835

Actions -

Score*	Patient Name	Age	Gender	Facility MRN	Facility Encounter ID	Admission Date	Discharge Date	Inpatient LOS	Primary Diagnosis	Primary Procedure	Payor
60		66			161273883	03/03/2014					MARTINS POINT HLTH CARE-MAI ADVANTAGE PART A
59		48			161031398	02/21/2014	02/21/2014	0.0			SELF PAY - PATIENT REQUEST
51		22			161285267	03/02/2014	03/02/2014	0.3			MAINECARE MANAGED CARE
49		68			161316211	03/01/2014					AETNA MEDICARE PLAN-HMO-PA
49		62			160429346	02/24/2014	02/28/2014	4.3			BC FEDERAL
48		76			161008867	02/21/2014	02/24/2014	3.0			MEDICARE PART A
48		82			161047873	02/22/2014	03/01/2014	7.1			MEDICARE PART A
47		64			161218037	02/27/2014	03/02/2014	3.5			SELF PAY
47		55			160955936	02/19/2014	02/27/2014	7.5			MAINECARE MANAGED CARE
44		29			161219233	02/27/2014	02/27/2014	0.5			SELF PAY
44		62			160929410	02/19/2014	02/21/2014	2.1	42731 ATRIAL FIBRILLATION		MEDICARE PART A
44		31			161053558	02/23/2014	02/26/2014	3.4	2771 DIS PORPHYRIN METABOLISM		MAINECARE MANAGED CARE
43		40			161297700	03/01/2014					ULTRABENEFITS, INC.
43		80			161052162	02/22/2014	02/25/2014	3.0			MEDICARE PART B
43		85			161051693	02/22/2014	02/27/2014	5.0			HANCOCK COUNTY HOMECARE
43		54			161056692	02/25/2014	02/27/2014	2.0			MEDICARE PART A
43		41			159527464	02/28/2014	03/02/2014	2.3			PATIENT ADVOCATES LLC
43		78			161235916	02/27/2014					MEDICARE PART A
43		68			161005533	02/20/2014	02/24/2014	3.7	25002 DIABETES MELL TYPE II UNCONT (Begin 1993)		MEDICARE PART A
42		60			160958245	02/20/2014	02/23/2014	3.6	4871 FLU W RESP MANIFEST NEC		MAINECARE MANAGED CARE
42		50			160958484	02/20/2014	02/23/2014	3.3	5849 ACUTE RENAL FAILURE NOS		MEDICARE PART A
42		69			161047477	02/22/2014	02/26/2014	4.5	51881 RESPIRATORY FAILURE (Begin 1987)	9390 CONT POS AIRWAY PRESSURE (Begin 1988)	MEDICARE PART A

Population Risk Management Dashboards: Population Profile



Population Risk Management Dashboards: Individual Patient Summary

Patient Summary

Patient Information

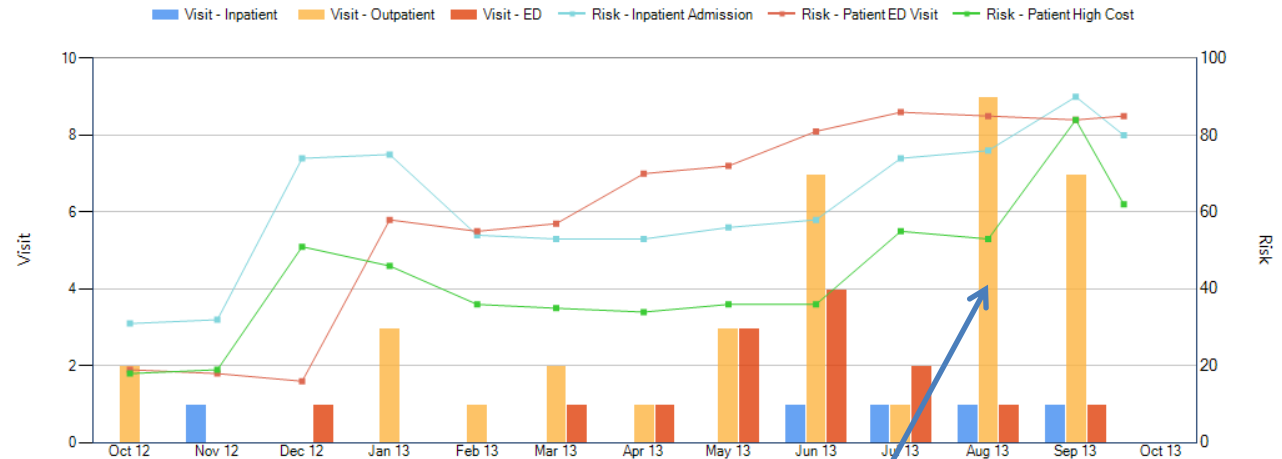
First Name : 295871
 Last Name : 295871
 Middle Name : A
 Age : 59
 Gender : F
 Date Of Birth : 02/03/1954
 Date Of Death :

Patient Current Risk Profile

High Cost Risk Score : 75
 IP Admission Risk Score : 89
 ED Visit Risk Score : 84
 Last 30 Day Readmission Risk Score : 42
 Last IP Encounter Discharge Date :

Patient Previous 12 Months History

Inpatient Admissions : 5
 Inpatient Total Patient Days : 21
 ED Visits : 14
 Outpatient Visits : 36



The summary above shows that this 59 year old female had 5 inpatient admissions, 14 ED visits, and 36 outpatient visits in the last 12 month period.

The chart shows the timing of each encounter along with the risk scores increasing over time.

HealthInfoNet Data Use and Request: By Participants and Non Participants

1. Participant request for clinical data for treatment and/or operations purposes
2. Participant request for meeting reporting requirements
3. Request by Participant for providing clinical data to patients via PHR
4. Request for utilization data authorized as public
5. Request by a non-Participant for provider specific data not considered public

HIN State Innovation Model (SIM) Grant Activities

- Provide **automated notifications** to MaineCare care management staff as well as participating provider care managers when MaineCare patients are admitted to Emergency Departments and Inpatient Settings (Approval by HIN data use committee received 3/13)
- Continuing HIN's **Behavioral Health HIT** efforts:
 - Paying for HIE subscription fees for participating behavioral health providers
 - Supporting HINs technical needs in managing the opt-in model
 - Providing EHR adoption incentives to BH Providers to support their purchase and implementation of EHRs and connect to HealthInfoNet
- Developing and deploying the "**blue button**" **approach** to allowing patients who access their medical records through provider-base personal health portals, to access their HealthInfoNet data
- **Measuring clinical quality of care** delivered for MaineCare patients and reporting those quality measures to provider and MaineCare (pending approval by the HealthInfoNet Data Use Oversight Committee and validation by participating organizations)

Pharmacy HIE Opportunities

- HIN currently contracts with Sure Scripts / Rx Hub medication information from adjudicated claims
 - Drugs paid for in cash are missing and HIN has no way of collecting immunization data from pharmacies (and retail clinics)
- Pharmacies are moving toward Medication Therapy Management (MTM)
 - Access to HIN will support better decision making by pharmacists
 - HIN data can assist in conducting medication reconciliation with patients
- Pharmacy information systems are often not optimally designed to support clinical encounters
 - Pharmacists currently spend time seeking clinical information from providers/labs when filling prescriptions
 - Can HIN support the development of a pharmacy medical record?
 - HIN is currently planning the deployment of a statewide secure messaging structure – how can this be leveraged to support pharmacy needs?
- Are there other areas of potential collaboration?

Questions/Comments?

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