ECU REACH:
Clinical Informatics & Analytics Overview

( \text{brain} + \text{computer} ) \geq \text{brain}

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Learning Objectives

• Understand the structure of clinical data in the EHR and the mechanisms available for clinical quality reporting to drive clinical improvement projects
Agenda

• Intro to Clinical Informatics
• Overview of Clinical Data Impact
• Summary of Clinical Data Types and Sources in Epic
• Survey of Epic Clinical Reporting Tools
• Vidant Health Clinical Data Governance and Roadmap
• Ambulatory Analytics 2014-2015
• Questions
“Clinical Informatics is the application of informatics and information technology to deliver healthcare services. It is also referred to as applied clinical informatics and operational informatics.”

» American Medical Informatics Association, 2014

Biomedical and health informatics (BMHI) is the field concerned with the optimal use of information, often aided by technology, to improve individual health, healthcare, public health, and biomedical research.

» Bill Hersh, MD 2014
Physicians in all 24 subspecialties are now eligible to become Board Certified in Clinical Informatics through an exam offered by the American Board of Preventive Medicine.

First exams were held October 2013.
Clinical Data Impact

• Time studies of inpatient physicians find
  – Physicians spend about 15-38% of their time in direct patient care, 50-67% of their time in indirect patient care, divided between reviewing results, performing documentation, and engaging in communication
    • (Ammenwerth, 2009; Tipping, 2010; Kim, 2010; Tipping, 2010; Yousefi, 2011) and emergency (Chisholm, 2011)

• Time studies of ambulatory physicians find
  – Physicians perform about 14-39% of work outside the exam room,
  – and work related to patient when he/she not present consumes 15-23% of physician work day
    • (Gilchrist, 2005; Gonschalk, 2005; Farber, 2007; Chen, 2010)
Clinical Data Types

• Collections of observations (datum)

• Composed of four elements
  – Patient (Joe Pye)
  – Attribute (Respiratory rate)
  – Value of attribute (20 breaths per minute)
  – Time of observation (time of this talk...talking a lot)

• Multiple types
  – Narrative text
  – Numerical
  – Coded data (terminology)
  – Recorded signals
  – Pictures
  – Audio
  – Video
Clinical Data Entry

• **Unstructured**
  – Free text
  – Dictation, Dragon, typed
  – Does not populate database
  – Does not populate reports
  – Does not trigger decision support
  – (EHR is blind to it)
  – Fast, easy, free expression

• **Structured**
  – Menu/button driven entry
  – Interfaced data (i.e., results)
  – Populates database
  – Can be gathered, processed for reports
  – Triggers warnings, alerts, reminders
  – Reduces ambiguity
  – Requires build
  – Often more time consuming
  – Requires consistent use
Overview of Epic Data Sources

Unstructured
- Free Text Notes
  - Dictated, typed and Dragon
  - Ambulatory, Inpatient and Operative Notes
- Interfaced free-text results
  - Pathology reports
  - Blood, urine cultures
  - Radiology reports
- Content entered using copy/paste

Structured
- Structured notes (if linked to data)
  - Notewriter
  - Smarttexts
  - Smartlists
- Orders
- Problem list and encounter dx
- Medications
- Allergies
- Interfaced lab results
- Document Flowsheet Entries
- Health Maintenance
Garbage in, Garbage Out

- Clinical Analytics is only as good as the consistency and quality of the workflows that generate the data.

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“I’m dieting faithfully. For breakfast I follow the Egg Lovers Diet. At lunch, I switch to the Fast Food Diet. For dinner, I do the Steak-n-Pasta Diet. And during TV I switch to the Chip-n-Dip Diet.”

VIDANT HEALTH™
Clinical Data Sources in Epic

**Integrated Data**

- **Chronicles**
  - Integrated transactional database
  - Real-time
  - 100,000+ data elements
  - Intersystems Cache
- **Clarity**
  - Integrated analytical database
  - Updated nightly
  - 100,000+ data elements
  - Microsoft SQL Server or Oracle
- **Warehouse**
  - Combines Epic + non-Epic data
  - Typically updated nightly
  - 15 subject areas
  - Microsoft SQL Server only
Epic Chronicles

• Epic database
• Underlying structure that allows reports and searches
• User-entered data is immediately available in Chronicles for real-time reporting
• Reporting Workbench and Radar report on Chronicles data
Epic Clarity

- Data is extracted weekly from live EHR into Clarity database
- Used for reports on large amounts of long-term data without slowing live EHR
- Used for reports requiring significant analysis
- Open to third-party tools
- Clarity data can be combined with other non-Epic data sources for enterprise-wide reporting
- Can be linked to Reporting Workbench
Epic Registries

• Rules-based identifying and tracking system for complex patient populations
• Created in Chronicles for real-time interventions
• Extracted to Clarity as a pre-created report framework
• Registries support report writing, improve query performance, and provide reproducible results from report to report
• Epic has pre-created registries for chronic disease and wellness
Due to copyright, Epic EHR screenshots and images have been redacted. An original copy can be requested for Vidant Health and ECU Physicians Providers who are licensed to use the Epic EHR.
Reporting Tools - Workbench

• Self-service, flexible tool available to end users

• Users can
  – run administrator-created reports with real-time data
  – build reports from templates
  – access saved results

• Epic provides a library of standard templates for reports
  – Clinical summaries
  – Task lists for users or require follow-up in the Epic application.
  – The Batch Scheduler helps you to schedule these reports regularly at a time that is best for system performance.
Reporting Tools – Crystal Reports

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• Crystal Reports is a reporting tool
• Used for reporting on large amounts of long-term data
• Can schedule using Epic-Crystal integration
• You can also drill down in Crystal reports to see more specific levels of granularity
• Running Crystal reports does not hurt the performance of your production environment because they are exclusively on your Clarity reporting database
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Reporting Tools - Dashboards

• Centralized access point to deliver report results and data visualizations

• Users can:
  – assess metric data
  – compare organizational performance against industry benchmarks
  – jump to common Hyperspace activities
  – edit a Reporting Workbench report

• Dashboard components can also contain:
  – stand-alone visual displays of information with threshold icons and trending data
    • monitor Key Performance Indicator metrics
    • potentially replaces the need for specific reports

• Users can personalize dashboards
Epic-Released Content

• Epic creates reports for general use by their customers
• Released reports, combined with foundation system configurations can streamline analytics delivery timelines
• Reporting Workbench has templates that allow super users to create reports quickly by choosing from pre-selected options
• Epic’s UserWeb hosts the Data Handbook, the hub for information about leveraging released reporting content and creating custom reports
  – It includes Epic’s Report Repository
Epic Report Repository

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- Website of all of Epic’s reports
  - Descriptions and screenshots
  - Reports can be imported from Epic for faster implementation
  - This is the recommended starting point for all new report requests
Clinical Data Governance

• Vidant Health is developing clinical data governance for ongoing prioritization of new requests for analytics
• There are hundreds of outstanding requests for reports
• System quality initiatives have been determined based on high-impact clinical disease & clinical processes, including sepsis, diabetes, patient-centered medical home, readmission risk management and care coordination
• Harmonization of diagnosis definitions, data dictionaries, standard reports, etc., is underway
New Report Requests

• Vidant Health has prioritized aligning current clinical reports along Epic-released foundation reports
• Standard clinical report dashboards, core disease reports and self-service reports are under development
• Future report requests will be prioritized and queued
• Aligning analytics needs with existing reports or prioritized report families will avoid delays in project implementation
Ambulatory Analytics 2014-2015

• Physician Dashboards
  – Meaningful Use & PQRS
  – My Panel Metrics
    • Diabetes
    • CAD
    • CKD
    • CHF
    • COPD
    • Obesity
    • Pediatric Immunizations
    • Wellness & Cancer screening

• Clinic Dashboards
  – Inbasket monitoring
  – Messaging queues and volume
  – Visit statistics
  – Meaningful Use
  – Clinic coverage & scheduling
  – EHR use proficiency
  – Clinic productivity
Ambulatory Analytics 2014-2015

• Self-service Report Examples
  – My Patients with <X>
    • Asthma, Diabetes, CAD, CHF, COPD, etc.
  – My Patients Overdue for <x Health Maintenance Topic
    • My Female Patients 50-74 w/ Overdue Mammogram Health Maintenance
    • My Patients 51-80 with Overdue Colorectal Cancer Screening
    • My Patients 0-2 Years w/o Lead Screening in Past 2 Years
  – My Patients with <X> Problem List Diagnosis
  – My Patients with <X> Problem List Dx not Seen in Past <Y> Months
  – My Patients with <X> Problem List Dx not on Medication in <Y> Group
    • My Patients with Diabetes Not on Anti-diabetic Medication
  – My Patients with Diabetes with High <X>
    • HgbA1C, LDL, Triglycerides, Creatinine
Questions?

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Planning Clinic Quality Projects in Epic

- Identify problem to be solved
- Review clinical workflows that generate data
- Identify clinical data targets for measuring outcome
- Harness existing analytics tools already live (ideally)
- Reengineer clinical workflows as appropriate
- (Review needed Epic-released tools using Data Handbook)
- (Submit request through appropriate clinical governance)
- There are no “IT Projects”. There are only IT-enabled clinical projects.
For more information

- Portions of this presentation were adapted from slidesets provided by Vidant Health Office of the CMIO, Epic Systems and AMIA’s 10x10 Program.
- https://userweb.epic.com/
- http://www.amia.org/education/10x10-courses
- http://skynet.ohsu.edu/~hersh/