Lehigh Valley Health Network
LVHN Scholarly Works

Administration & Leadership

Knowledge Integration: The IAIMS Experience at LVH.

Donald L. Levick MD
Lehigh Valley Health Network, donald.levick@lvhn.org

Linda M. Schwartz MDE, AHIP, CM
Lehigh Valley Health Network, linda_m.schwartz@lvhn.org

Bryan G. Kane MD
Lehigh Valley Health Network, bryan.kane@lvhn.org

Follow this and additional works at: http://scholarlyworks.lvhn.org/administration-leadership

Part of the Business Administration, Management, and Operations Commons, Health and Medical Administration Commons, and the Management Sciences and Quantitative Methods Commons

Published In/Presented At

Levick, D. L., Schwartz, L. M., Kane, B. G. (2007, October 1). *Knowledge Integration: The IAIMS Experience at LVH.* Presented at: Lehigh Valley Health Network, Allentown, PA.

This Presentation is brought to you for free and open access by LVHN Scholarly Works. It has been accepted for inclusion in LVHN Scholarly Works by an authorized administrator. For more information, please contact LibraryServices@lvhn.org.

Knowledge Integration: The IAIMS Experience at LVH

The IAIMS Planning Grant at LVH

Integrated Advanced Information Management Systems

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Agenda

- What is IAIMS – Don Levick, M.D., MBA
- The Digital Library – Linda Schwartz, MDE
- EPOC at LVH – Bryan Kane, M.D.
- Clinical Decision Support – Don Levick

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

What is IAIMS?

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

What is the IAIMS Grant?

- Planning Grant from National Library of Medicine awarded to LVH and the Information Services Department
- Total of $150,000
- Used to plan interdisciplinary efforts within and outside of I.S. to align clinical information and data with Network strategic vision

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

IAIMS: Definition

- A managed, networked information environment whose dimensions are dictated by the organization's strategic plan
- The IAIMS environment integrates diverse resources and services to deliver convenient and comprehensive access to information
- Seamlessly integrating an institution's own information resources with relevant information obtained from sources outside the organization

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

The Case for IAIMS

- Progress has been slow in the area of organization change to support information management within and between healthcare organizations
- How best to draw from the common information space the right subset of information and present in the most useful and understandable way

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Examples

- Research and Education: delivering research information to consumers that supports personal health decisions about participation in a clinical trial
- Education and Healthcare: creating clinical cases in real-time for use in education

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Examples

- Tufts University: partnership with NE Med Center based on shared information network; clinical research database; image database; new organization model for managing information resources
- Vanderbilt University: new strategic alliances for development of commercial software; creation of university-wide Information Architect

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Examples

- University of Pittsburgh: introduced campus-wide online access to health sciences library; developed a ‘Clinical Event Monitor’ for Clinical Decision Support (CDS); faculty research database; physician-friendly querying tool for network data warehouse

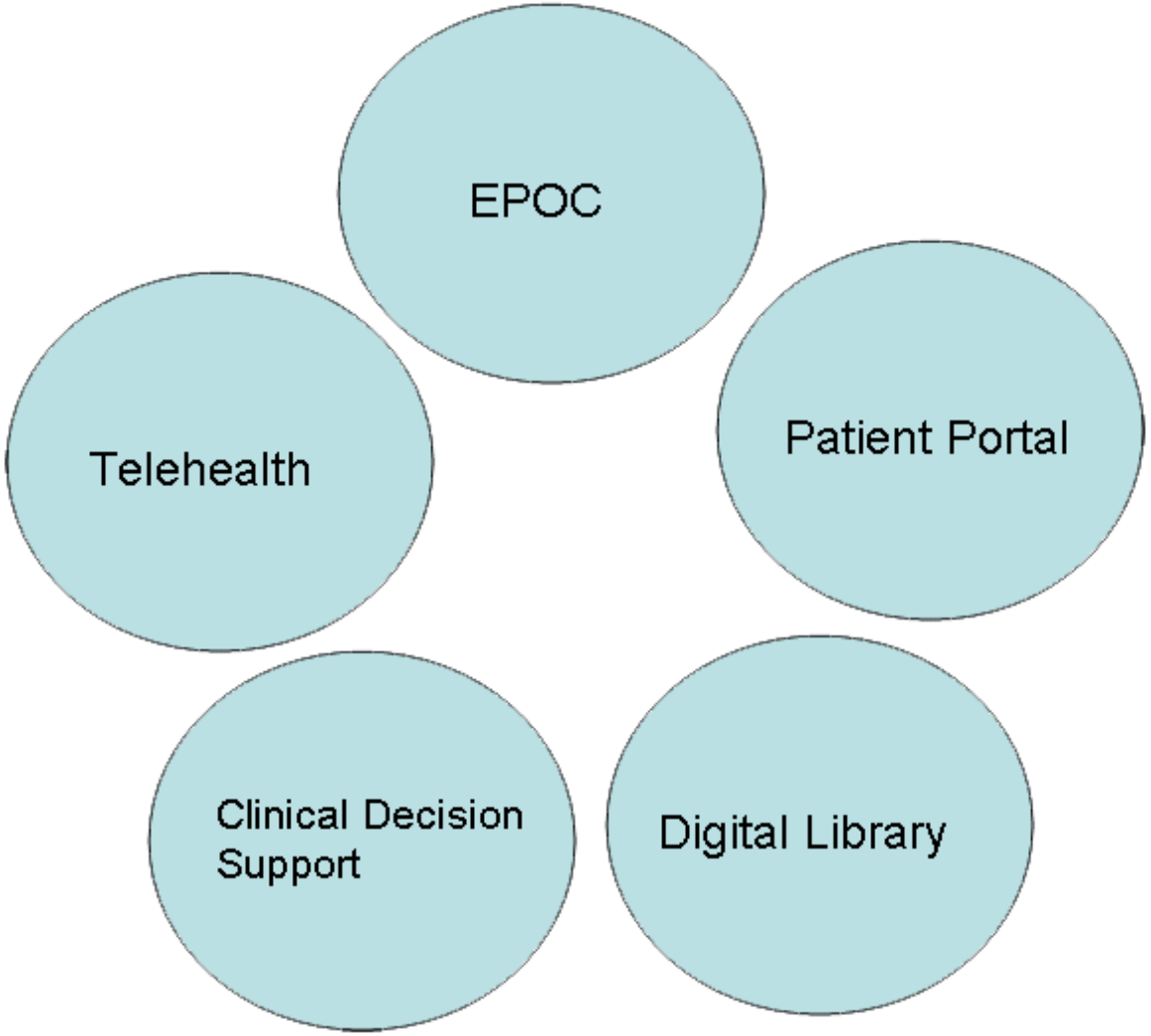
LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

IAIMS at LVH

- Five areas of concentration:
  - Digital Library
  - Clinical Decision Support
  - Telemedicine
  - Evidence at the Point-of-Care
  - Patient Portals

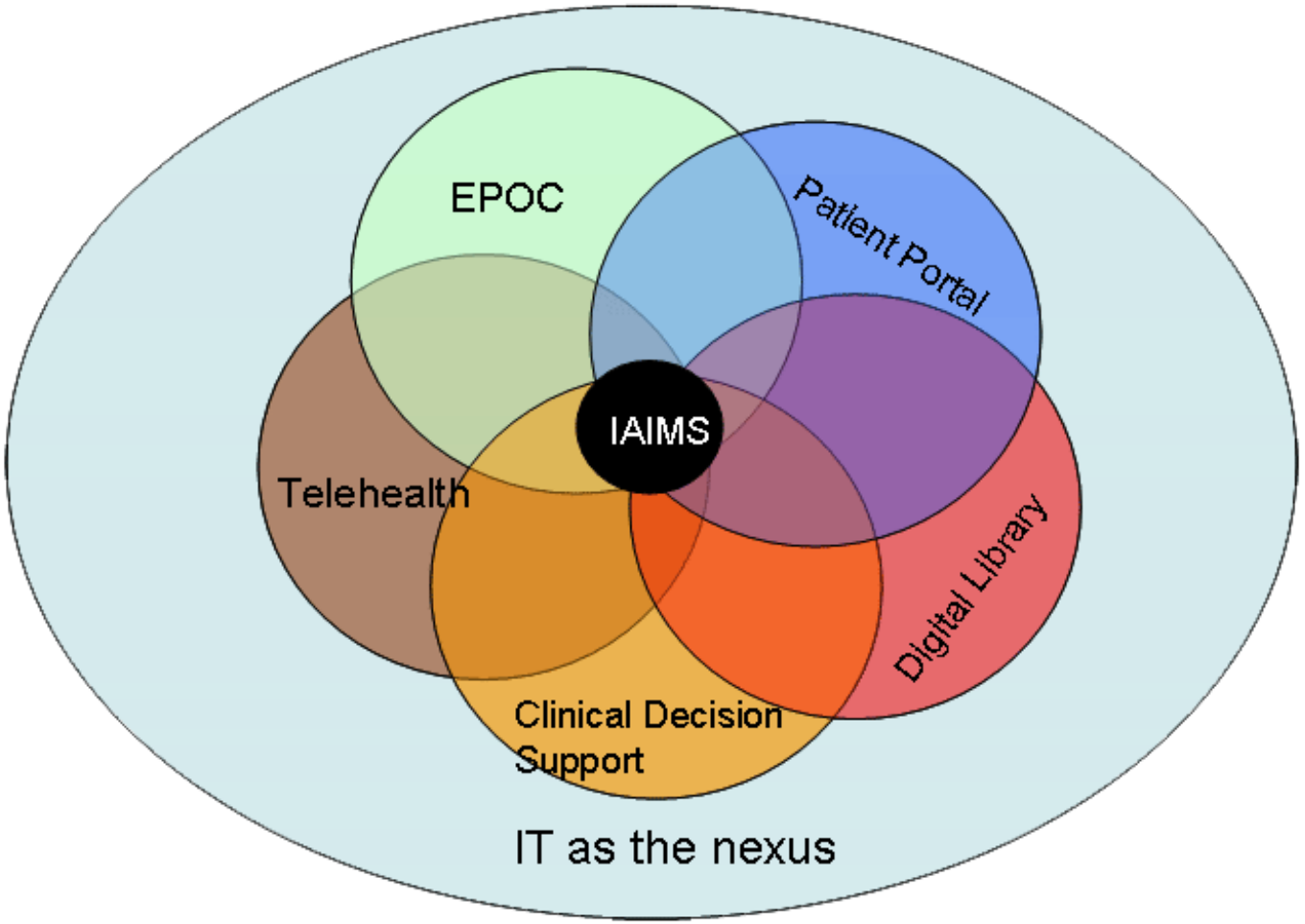
LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Pre-IAIMS Information Integration



LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Ultimate Goal for Integration



LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

IAIMS Activities

- Multidisciplinary meetings
- New collaborations
- Increased awareness of digital resources within the hospital
- Collaboration with other IAIMS institutions
- Potential collaboration with Columbia University Hospital

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

IAIMS Activities

- Sponsoring on-site training of EPOC by University of Virginia
- Domain members sponsored for educational activities
- Multidisciplinary group working to prioritize the expert rules and other forms of clinical decision support

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

IAIMS Fundamental Requirements

- Involvement of all stakeholder organizations at the institution in the development of the plan
- Creation of a plan that addresses the needs of stakeholders in basic mission areas, such as education, research, clinical healthcare and administration

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Institutional Success Factors

- Institutional culture is supportive
  - Committed to IAIMS
- In-house expertise
  - I.S. and library staff
- Financing
- Organization and Management
  - Overlap of committees (for info sharing)
- Programs and Partnerships
  - Working relationships among groups
- Systems and Standards
  - Consistency of systems, hardware, data standards

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Features of an IAIMS Organization

- An information management plan
- An organizational mechanism for coordinating the management and development of the enterprise's information infrastructure
- Stakeholder involvement in planning
- Unified and remote access to the institution's network-based information resources
- Technology to enable the application of knowledge – to improve health, to enable good decisions, to enhance learning, to aid discovery and innovation

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Beneficial Effects of IAIMS

- A change in the way participants think about information networks and resources
- Direct involvement: participation in groups
- Secondary involvement: increasing I.S. related knowledge base and skills of participants
- New collaborations within the organization were formed
- Organizational changes resulting in more coordinated planning, budgeting and implementation of information systems

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

END

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Integrating Evidence Based Resources to Support Patient Safety

Linda Matula Schwartz, MDE, Information Specialist

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Information Domains

Clinical Decision Support

Digital Library

EPOC

Patient Portal

Telehealth

Knowledge Translation

Using research, education, quality improvement and electronic systems development to facilitate the transfer of high quality evidence from research to clinical practice in order to

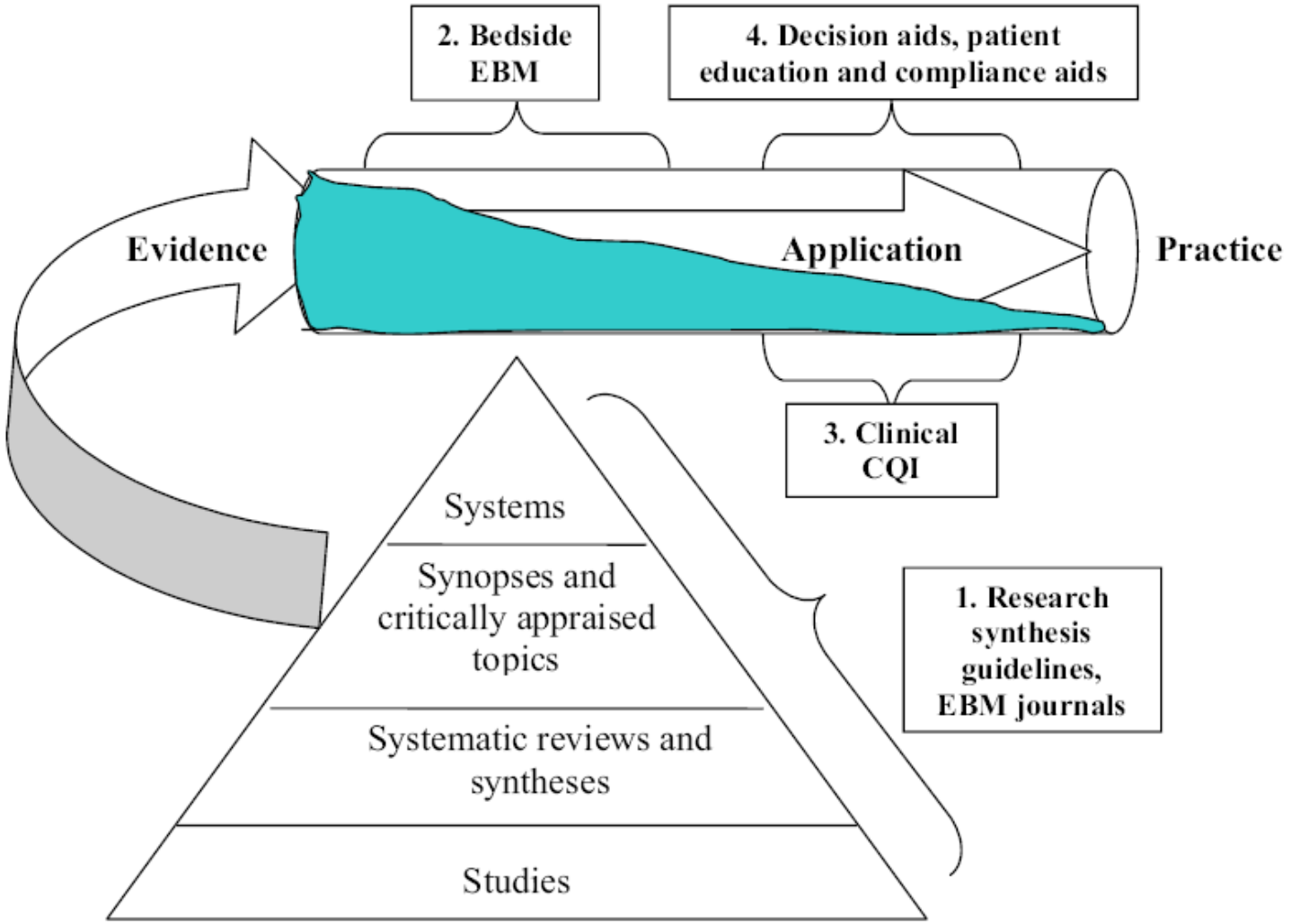
-- reduce errors

-- increase use of proven knowledge

-- decrease use of inappropriate therapies

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Moving from Awareness to Adherence



Lang, E.S., Wyer, P.C., & Haynes, R.B. (2007, Mar.). Knowledge translation: closing the evidence-to-practice gap. *Annals of Emergency Medicine*, 49(3):355-363.

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Digital Library Mission

1. Identification of appropriate knowledge-based information (KBI) products

   - **Bibliographic Databases**
   - **Evidence Based Content**
   - **Electronic Books and Journals**
   - **Clinical Calculators and Decision Support Tools**
     - **Pediatric weight-based dosing calculator**
   - **Clinical Guidelines from Professional Organizations**
   - **Consumer Health content**
   - **Expert Rules/Core Measure Programs**
   - **Medical Images**

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Digital Library Mission

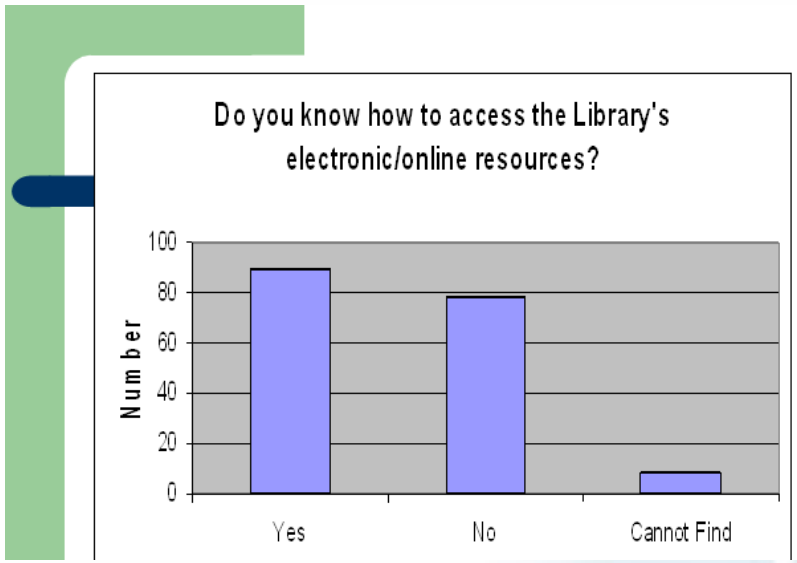
2. Plan for content evaluation process of KBI programs

   - Identify key stakeholders in clinical areas to act as content evaluators

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Digital Library Mission

3. Education on use of KBI programs accessible through the Digital Library



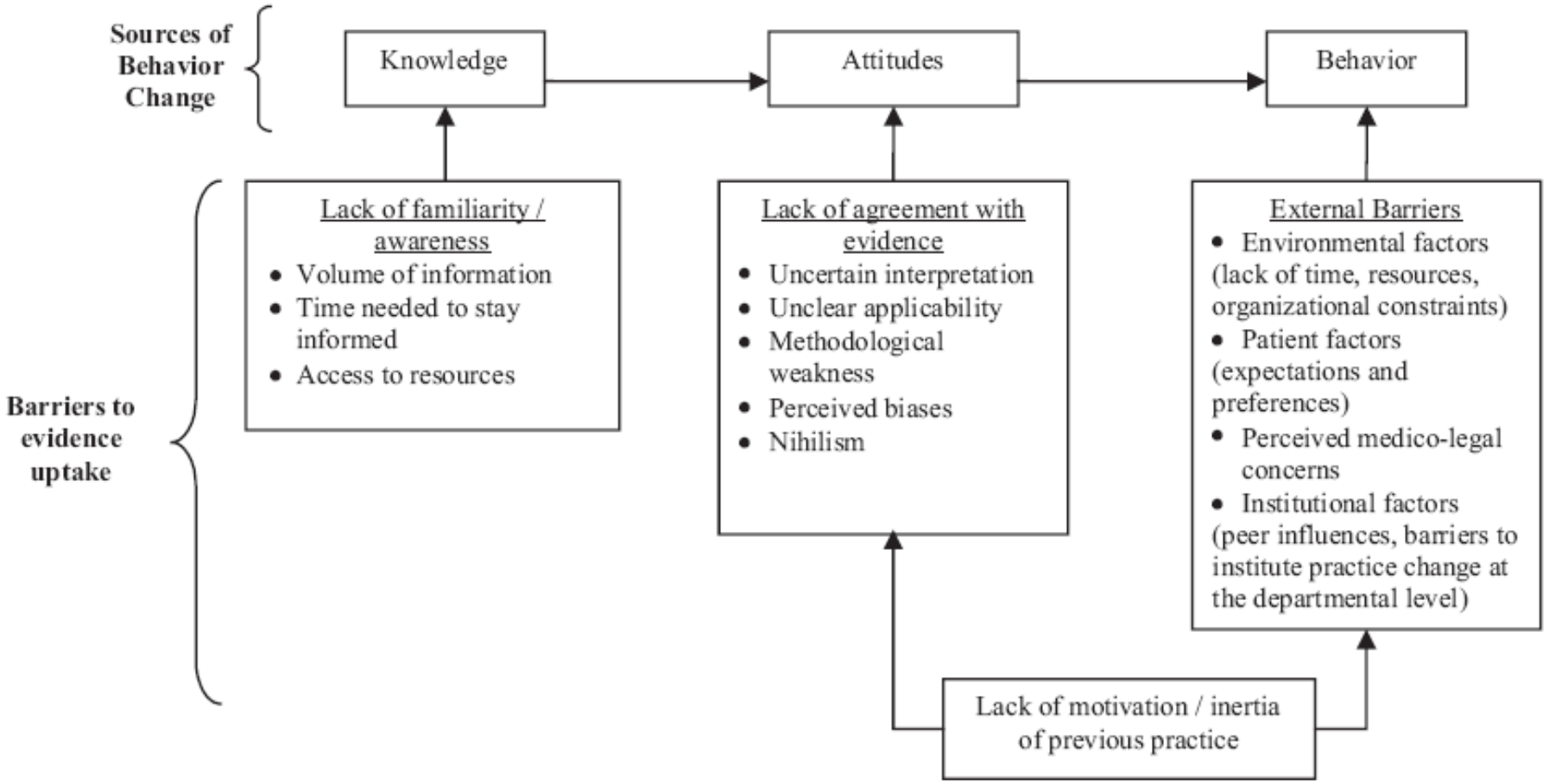
LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Survey Results: Common Issues for KBI Domains

- Lack of knowledge about what resources are available
- Ease of access to resources
- Speed of getting results
- Education on how to use resources
- Access to full text – especially PDFs
- Information specific to specialty areas

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Barriers to Adherence



Lang, E.S., Wyer, P.C., & Haynes, R.B. (2007, Mar.). Knowledge translation: closing the evidence-to-practice gap. *Annals of Emergency Medicine* 49(3):355-363.

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

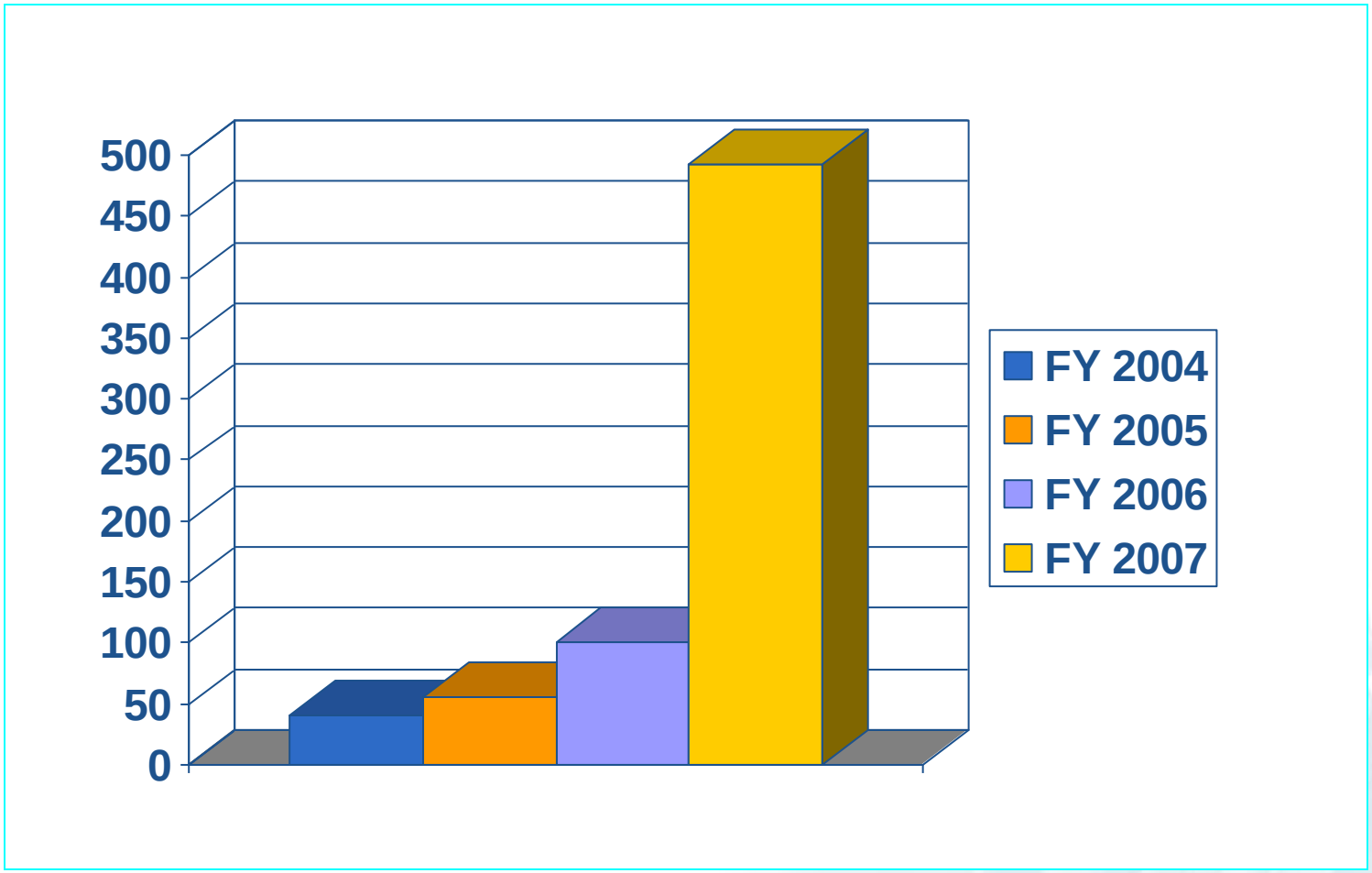
Digital Library Mission

3. Education on use of KBI programs accessible through the Digital Library

   - **Joint EBPx workshops with Nurse Researcher**
   - **Meetings with clinical teams for EBM projects**
   - **Orientations for new residents**
   - **Creation of online tutorials and program guides**

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Increased Training



LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

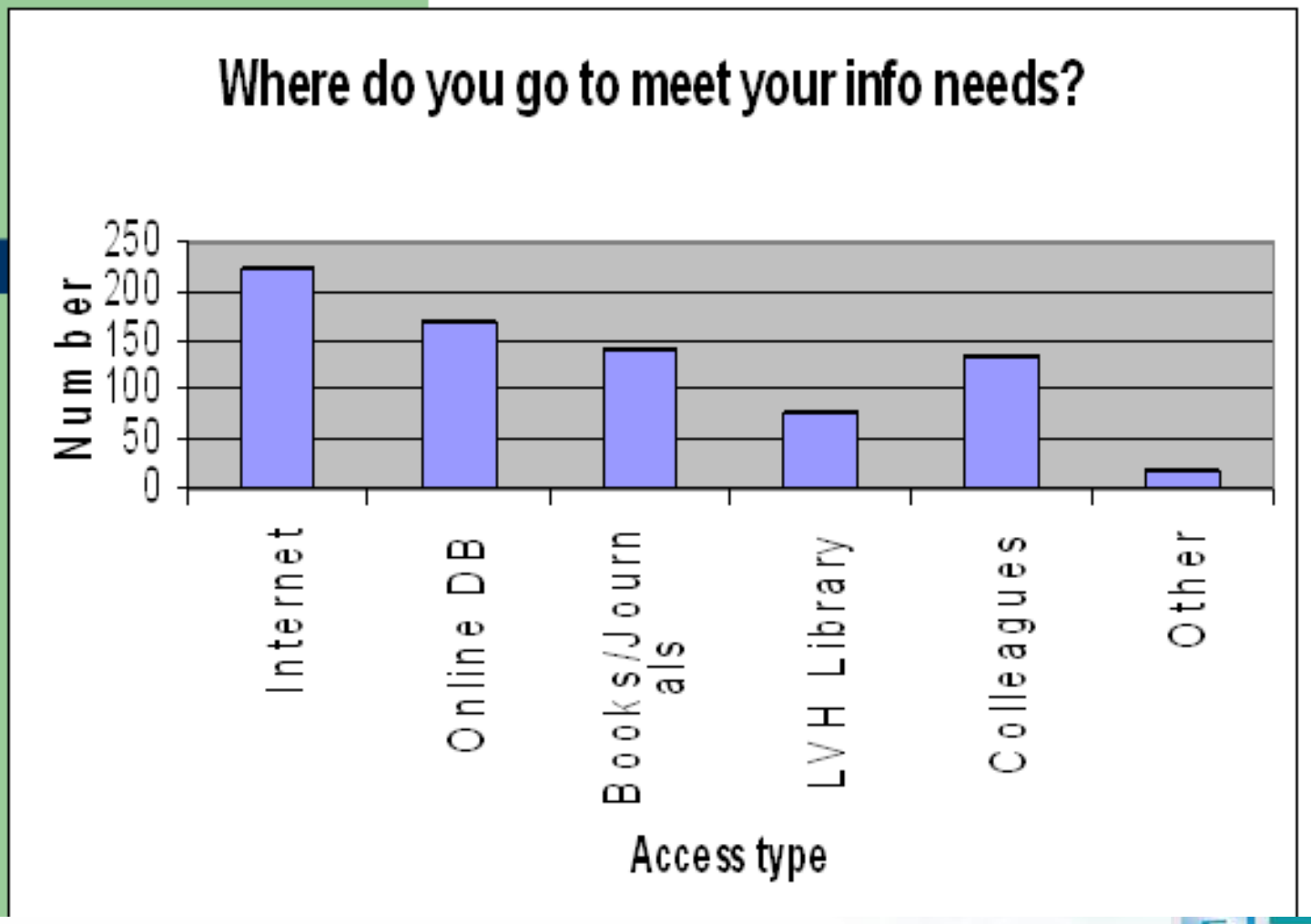
Digital Library Mission

4. **Identification of a seamless interface to organize access to multiple KBI resources including POC access**

- **VISIBILITY! – Library website, branding**
- **Conversion of print to electronic access**
- **A-Z Journal List**
- **Electronic book list by subject**
- **Electronic Current Awareness Program**
- **Creation of subject guides by specialty**
- **InfoButtons Technology**
- **Federated Search Tools**

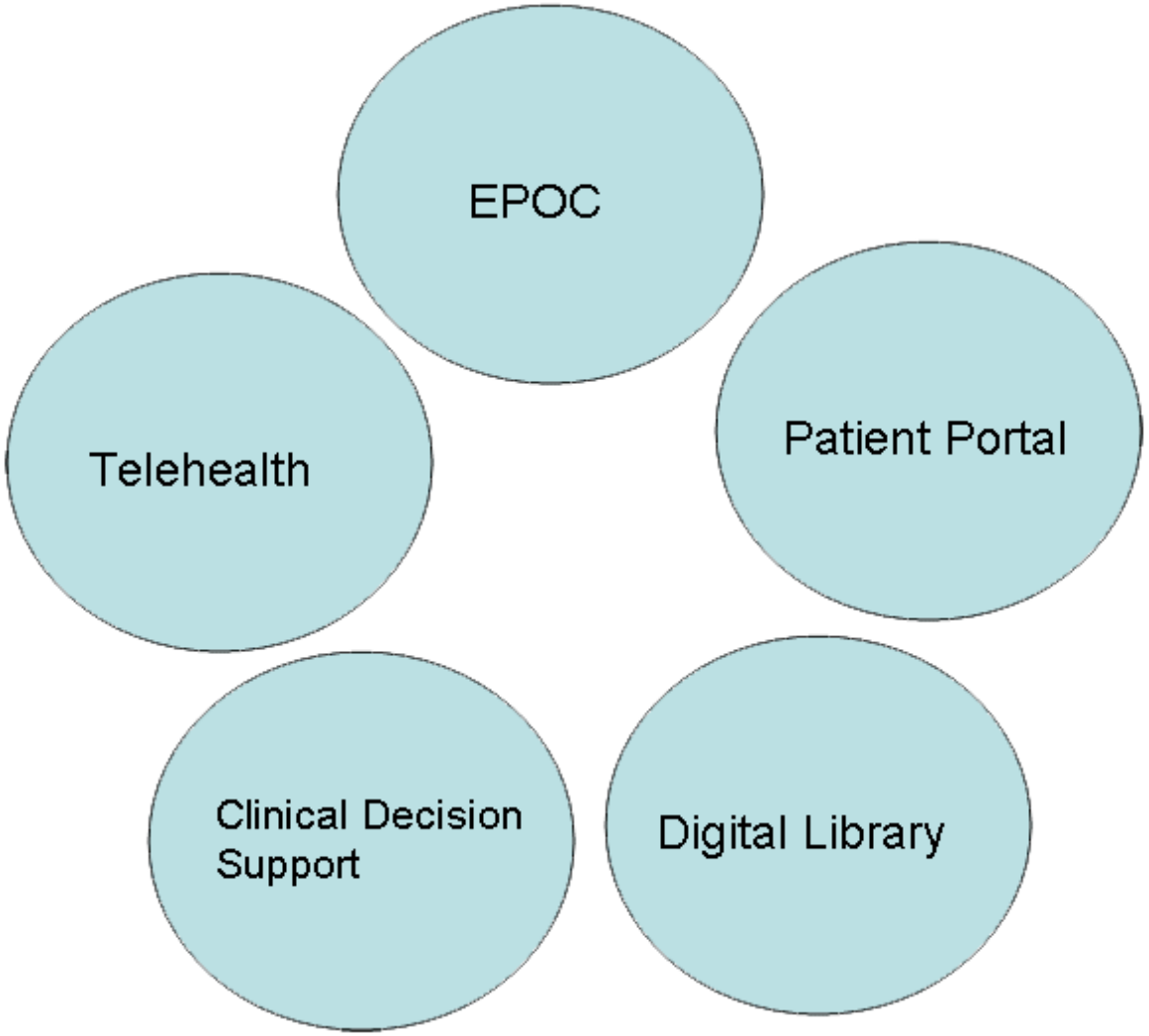
LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Survey Results



TH VALLEY
HOSPITAL
AND HEALTH NETWORK

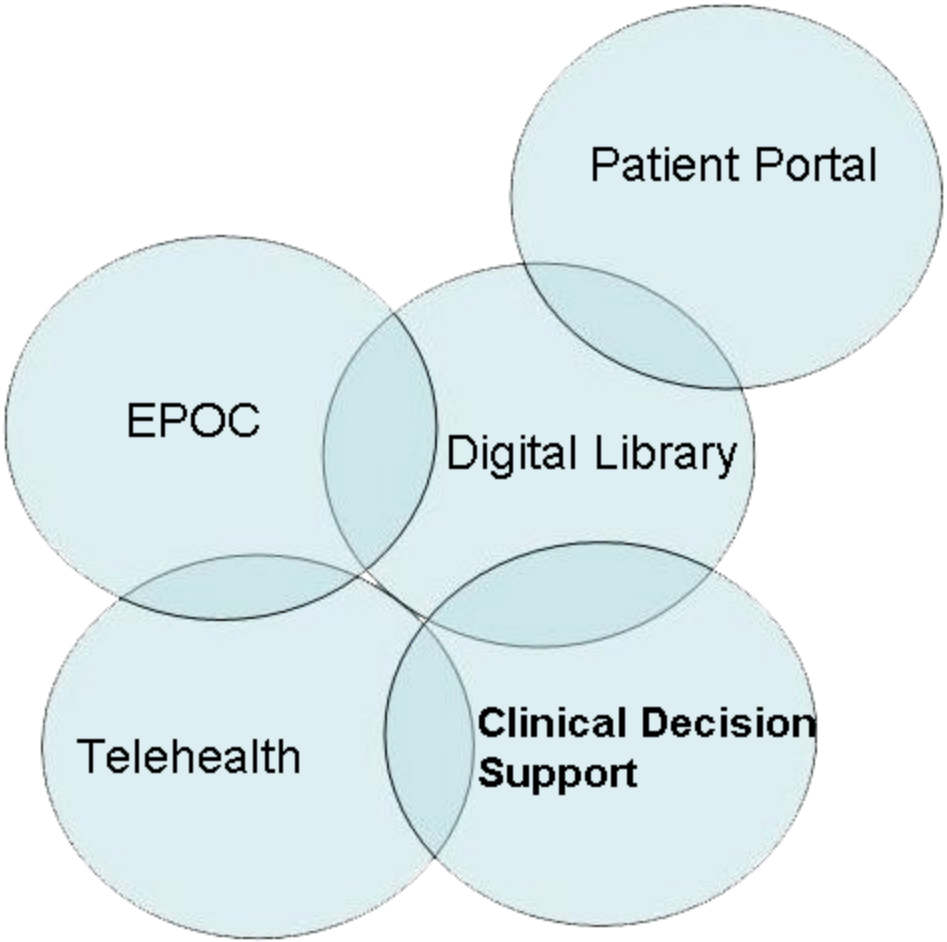
Pre-IAIMS Information Integration



LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

IAIMS Integration at 6 Months:

Library as Pivotal Content Source for Three Domains



LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Seamless Integration Interface

Features

- Ability to integrate a variety of KBI content at POC
- Ability to harvest context (patient, provider, institution) from CAPOE/EHMR
- Ability to tailor the resources offered to a user based on context
- Cross platform access – desktop, handheld, wireless

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Key Factors for Investigation of InfoButtons

- Identification of leading edge research projects
- Identification of a trend in vendor initiatives
- Literature review
- Discovery of proposed status as NISO HL7 interoperability standard for exchanging data with CAPOE/EHMR
- Discovery that GE/IDX (CareCast) is currently investigating an InfoButton interface
- Evidence of success – Columbia NY Presbyterian and Intermountain HC, Kaiser Permanente
- Opportunity to partner with leading expert

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Future Thinking

- Capability of requesting librarian assistance from POC – Recommendation from Clinical Decision Support domain

- Context triggered clinical images to support clinical care

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Future Thinking

With a seamless interface, mining the log data for provider context from the search queries could be beneficial as an indicator of:

1) **Need for additional KBI resources**
2) **Content to be included in POC access**
3) **Areas in which nursing or medical education can be targeted**

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Information Integration Impact on Patient Safety

- IOM (Crossing the Quality Chasm) identified efficient, rapid information support as critical in safe patient care
- Rapid, Just-In-Time education with evidence based information reduces reliance on “hallway consultations”
  - Static links – institutional and external documents
  - Dynamic searching of KBI databases
- Information tailored to quality and patient safety initiatives, e.g. safety, goals, core measures

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Information Integration Impact on Patient Safety

- Fostering a culture of inquiry and analysis of clinical decisions
- Identification of appropriate tools to address specific safety issues – e.g., PEPID, to address pediatric dosing
- Ensuring reference material currency via centralized online access

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Information Integration Impact on Patient Safety

- Incorporation of specialized information not readily available e.g., complimentary and alternative medicine
- Integration of patient education requests into the medical record with documentation of teaching
- Provision of quality patient/consumer health information

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

E.P.O.C. Efforts at Lehigh Valley Hospital

Bryan G. Kane, MD, FACEP
Lehigh Valley Hospital
Department of Emergency Medicine

Goals

- **Define evidence-based medicine**
- **Demonstrate use of EBM for a clinical question**
- **Identify EBM resources at LVHHN**

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Historical Perspective

JC

- Sir W. Osler 1875
- Sir J. Paget noted students in a bakery 1835
- Early US experience conducted in German, French or English

EBM

- McMaster Report 1992
- Shift from personal experience to “conscientious, explicit, and judicious use of current best evidence”

Linzer, Postgrad Med Journ, 1987

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

What is EBM?

- **Develop answerable question**
- **Efficiently acquire best evidence**
- **Critically appraise evidence**
- **Interpret the results for an individual patient**

Green, JGIM, 2000 Feb, 129-33.

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

EBM: A Way To Think About Your Patients

- **C**onvenient
- **R**elevant
- **I**ndividualized
- **S**elf-assessed
- **I**nteresting
- **S**ystematic

Box 1: The process of EBM

1. Convert information needs into answerable questions.
2. Track down with maximum efficiency, the best evidence with which to answer questions (whether from the clinical examination, the diagnostic laboratory, from research evidence, or other sources).
3. Critically appraise that evidence for its validity (closeness to the truth) and usefulness (clinical applicability).
4. Integrate this appraisal with clinical expertise and apply the result in clinical practice.
5. Evaluate one's performance.

Hardern, J Accid Emerg Med,

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

So You Have a Clinical Question…

- **Does a best practice related to health care professional attire exist?**
- **Does evidence related to patient-provider introductions exist?**

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Hunter vs. Gatherer

- **Information management**
- **Information grazing vs. searching**
- **Primary vs. secondary sources**

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Journal Watch Emergency Medicine Alert for January 26, 2007 - Inbox for bkane@ptd.net - Netscape 7.2

File Edit View Go Message Tools Window Help

Get Msgs Compose Reply Reply All Forward Next Junk Delete

Subject: Journal Watch Emergency Medicine Alert for January 26, 2007
From: jw-emergency-medicine@alerts.stanford.edu
Date: 1/26/2007 8:02 PM
To: kane@aya.yale.edu

Emergency Medicine for January 26, 2007

Decreasing CPR Interruptions in Out-of-Hospital VF Arrest

Summary and Comment | Subscription Required

Fewer interruptions were associated with improved outcomes.

By Aaron E. Bair, MD, FAAEM, FACEP
January 26, 2007
Covering: Rea TD et al. *Circulation* 2006 Dec 19; 114:2760-5

Bend in ETT Stylet Affects Ease of Intubation

Summary and Comment | Free

Bends greater than 35 degrees might increase risk of difficult intubation.

By Diane M. Birnbaumer, MD, FACEP
January 26, 2007
Covering: Levitan RM et al. *Acad Emerg Med* 2006 Dec 13:1255-8

ICU Discharge at Night Increases Mortality and Readmission

Summary and Comment | Subscription Required

Only half of nighttime discharges were due to emergent admissions in this large Canadian study.

By Tiffany M. Osborn, MD
January 26, 2007
Covering: Priestap FA and Martin CM. *Crit Care Med* 2006 Dec 34:2946-51

Rx Labels Frequently Misunderstood

Summary and Comment | Subscription Required

Low literacy prevents understanding of even seemingly simple labels.

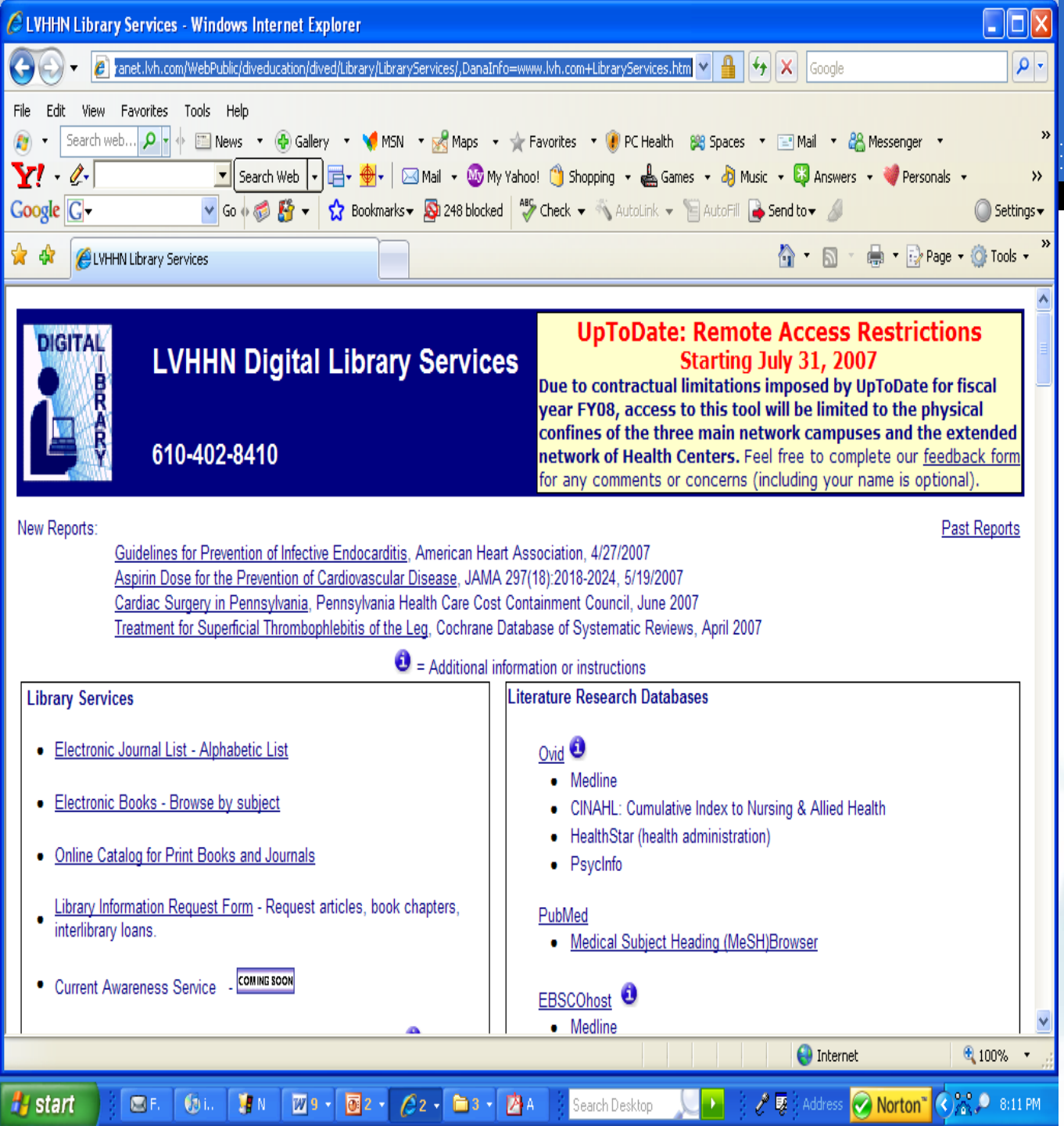
By J. Stephen Bohan, MD, MS, FACP, FACEP
January 26, 2007
Covering: Davis TC et al. *Ann Intern Med* 2006 Dec 19; 145:887-94
Schillinger D. *Ann Intern Med* 2006 Dec 19; 145:926-8

start N... Mi... Jo... 2 I... u... iT... 2 N Address Search Desktop Norton 4:49 PM

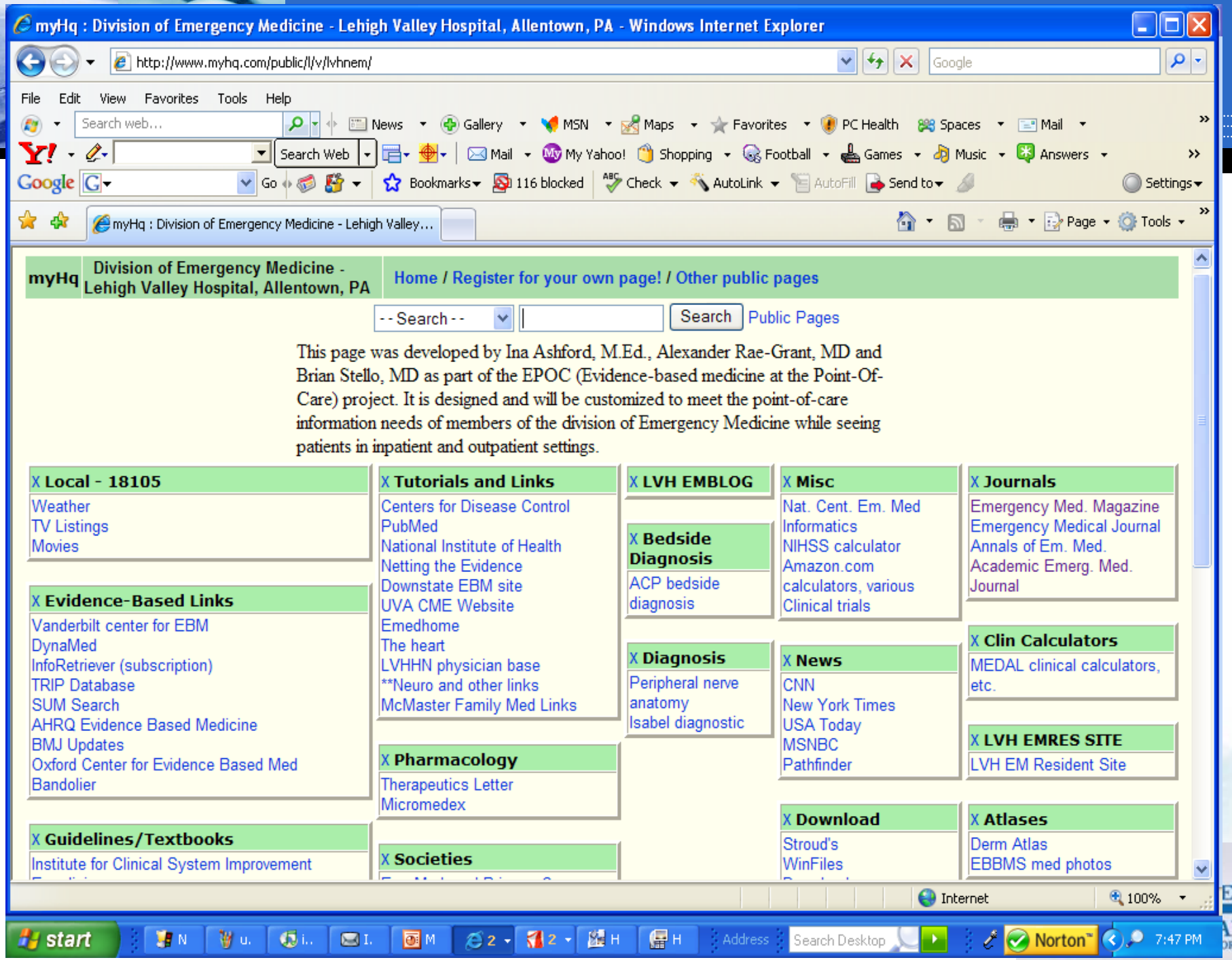
Resources

- **Departments**
  - **Non-Clinical**
    - **Library Services**

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK



LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK


myHq : Division of Emergency Medicine - Lehigh Valley Hospital, Allentown, PA - Windows Internet Explorer
http://www.myhq.com/public/l/v/lvhnem/
File Edit View Favorites Tools Help
myHq : Division of Emergency Medicine - Lehigh Valley...
myHq
Division of Emergency Medicine - Lehigh Valley Hospital, Allentown, PA
Home / Register for your own page! / Other public pages
-- Search --
Search
Public Pages
This page was developed by Ina Ashford, M.Ed., Alexander Rae-Grant, MD and Brian Stello, MD as part of the EPOC (Evidence-based medicine at the Point-Of-Care) project. It is designed and will be customized to meet the point-of-care information needs of members of the division of Emergency Medicine while seeing patients in inpatient and outpatient settings.
X Local - 18105
Weather
TV Listings
Movies
X Evidence-Based Links
Vanderbilt center for EBM
DynaMed
InfoRetriever (subscription)
TRIP Database
SUM Search
AHRQ Evidence Based Medicine
BMJ Updates
Oxford Center for Evidence Based Med
Bandolier
X Guidelines/Textbooks
Institute for Clinical System Improvement
X Tutorials and Links
Centers for Disease Control
PubMed
National Institute of Health
Netting the Evidence
Downstate EBM site
UVA CME Website
Emedhome
The heart
LVHHN physician base
**Neuro and other links
McMaster Family Med Links
X Pharmacology
Therapeutics Letter
Micromedex
X Societies
X LVH EMBLOG
X Bedside Diagnosis
ACP bedside diagnosis
X Diagnosis
Peripheral nerve anatomy
Isabel diagnostic
X Misc
Nat. Cent. Em. Med Informatics
NIHSS calculator
Amazon.com
calculators, various
Clinical trials
X News
CNN
New York Times
USA Today
MSNBC
Pathfinder
X Download
Stroud's
WinFiles
X Journals
Emergency Med. Magazine
Emergency Medical Journal
Annals of Em. Med.
Academic Emerg. Med. Journal
X Clin Calculators
MEDAL clinical calculators, etc.
X LVH EMRES SITE
LVH EM Resident Site
X Atlases
Derm Atlas
EBBMS med photos
Internet
100%
start
Norton
7:47 PM

Search Engines

physician greeting evidence based - PubMed Results - Windows Internet Explorer

http://www.ncbi.nlm.nih.gov/sites/entrez

File Edit View Favorites Tools Help

physician greeting evidence based - PubMed Results

NCBI

PubMed www.pubmed.gov

A service of the National Library of Medicine and the National Institutes of Health

My NCBI [Sign In] [Register]

All Databases PubMed Nucleotide Protein Genome Structure OMIM PMC Journals Books

Search PubMed for physician greeting evidence based Go Clear Save Search

Limits Preview/Index History Clipboard Details

About Entrez

Text Version

Entrez PubMed
Overview
Help | FAQ
Tutorials
New/Noteworthy
E-Utilities

PubMed Services
Journals Database
MeSH Database
Single Citation Matcher
Batch Citation Matcher
Clinical Queries
Special Queries
LinkOut
My NCBI

Display Summary Show 20 Sort by Send to

All: 2 Review: 0

Items 1 - 2 of 2 One page.

1: Makoul G, Zick A, Green M.

Related Articles, Links

An evidence-based perspective on greetings in medical encounters.
Arch Intern Med. 2007 Jun 11;167(11):1172-6.
PMID: 17563026 [PubMed - indexed for MEDLINE]

2: Kim S, Farber S, Kolko BE, Kim W, Ellsbury KE, Greer T.

Related Articles, Links

Faculty and student participation in online discussions of palliative care scenarios.
Fam Med. 2006 Jul-Aug;38(7):494-9.
PMID: 16823675 [PubMed - indexed for MEDLINE]

Done Internet 100%

start FW:Re... 3 Mic... Norton... 3 Mic... 4 Int... evidence based Address Norton 2:30 PM

VALLEY SPITAL TH NETWORK

Some Areas of Excellence

- **Library Services**
- **Family Practice**
  - **Faculty**
  - **Residents**
  - **Outpatient clinic**
- **Nursing**

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Just a Few Barriers?

- **Behavior**
  - New and different
  - Inserted into patient encounter
- **Technology**
  - Computers
  - Digital native vs. immigrant
- **EBM skill-set**
  - MeSH headings
  - Literature appraisal

Does All This Matter?

- **35 attendings and 12 residents**
- **Community hospital**
- **Syllabus, text and 7 hours of lecture**
- **262 consecutive pre, 275 post**
- **EBM "best Rx" from 74 to 82% (p=.046)**
- **Use of RCT Rx from 49 to 62% (p=.016)**
  - ***Strength of evidence improved as well***
  - ***Cardiac specific 87 to 98% (p=.02)***

Straus et al, JGIM, 2005 Apr, 340-

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

End

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Clinical Decision Support at LVHN

Don Levick, M.D., MBA

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

Current State of CDS

- Current state at LVH
- National initiatives
- Where CDS is headed

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

CDS at LVH

- Expert rules embedded into LastWord
- Event triggers in MetaVision
- Web resources
  - EPOC
  - Standard reference based resources
- Nursing protocols
- CAPOE order sets

Examples

- Order Set
- Protocol
- Expert Rules
- Resource Page

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

National Initiatives

- Pay For Performance (P4P)
- Core Measures
- Chronic Disease Management
- CMS Requirements
- Regulatory/Review Agencies
  - JCAHO
  - LeapFrog

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

The Next Steps

- Zynx
- Context sensitive expert rules
- Diagnosis triggered order sets
- Embedded evidence based links
- Protocols that drive orders based on results or documentation

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK

End

LEHIGH VALLEY HOSPITAL AND HEALTH NETWORK