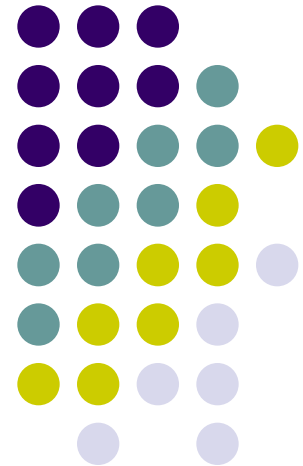# Trends in Clinical Informatics: A Nursing Perspective

Transforming Nursing Practice through Informatics and Technology

Joyce Sensmeier MS, RN-BC,
CPHIMS, FHIMSS, FAAN

Friday, April 29, 2011

NENIC
New England Nursing Informatics Consortium
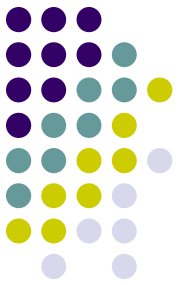*Moving Information THROUGH NURSING*

Objectives

- Describe current informatics issues and the impact on clinical leaders

- Explore practical strategies for successful EHR adoption and optimization

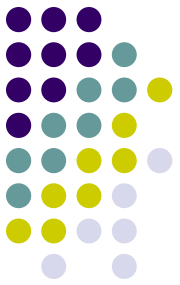- Envision the future of nursing and technology

American Recovery and Reinvestment Act of 2009

- HR 1 -- 111th Congress

- $787 Billion

- Highly partisan vote

- Tax benefits total $288 Billion

- Healthcare gets $147.7 Billion
  - $87B for Medicaid
  - $25B for support for extending COBRA
  - **$19B directly for HIT**
  - $10B for NIH

- Infrastructure allocated $81B

Transforming Health through Meaningful Use of Health Data

"Phased-in series of improved clinical data capture supporting more rigorous and robust quality measurement and improvement"
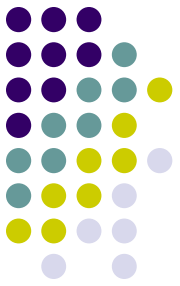
Improved outcomes

Advanced clinical processes

Data capture and sharing

*"These goals can be achieved only through **the effective use of information** to support **better decision-making** and **more effective care processes** that improve health outcomes and reduce cost growth"*
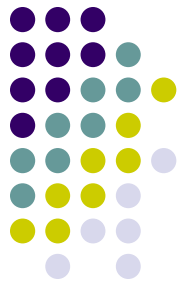
5 Steps for Turning Meaningful Use into an Opportunity for Nursing

➡ Start managing the change now

➡ Standardize in advance of system implementation

➡ Rationalize the documentation workload

➡ Act as stewards of data

➡ Seize the opportunity

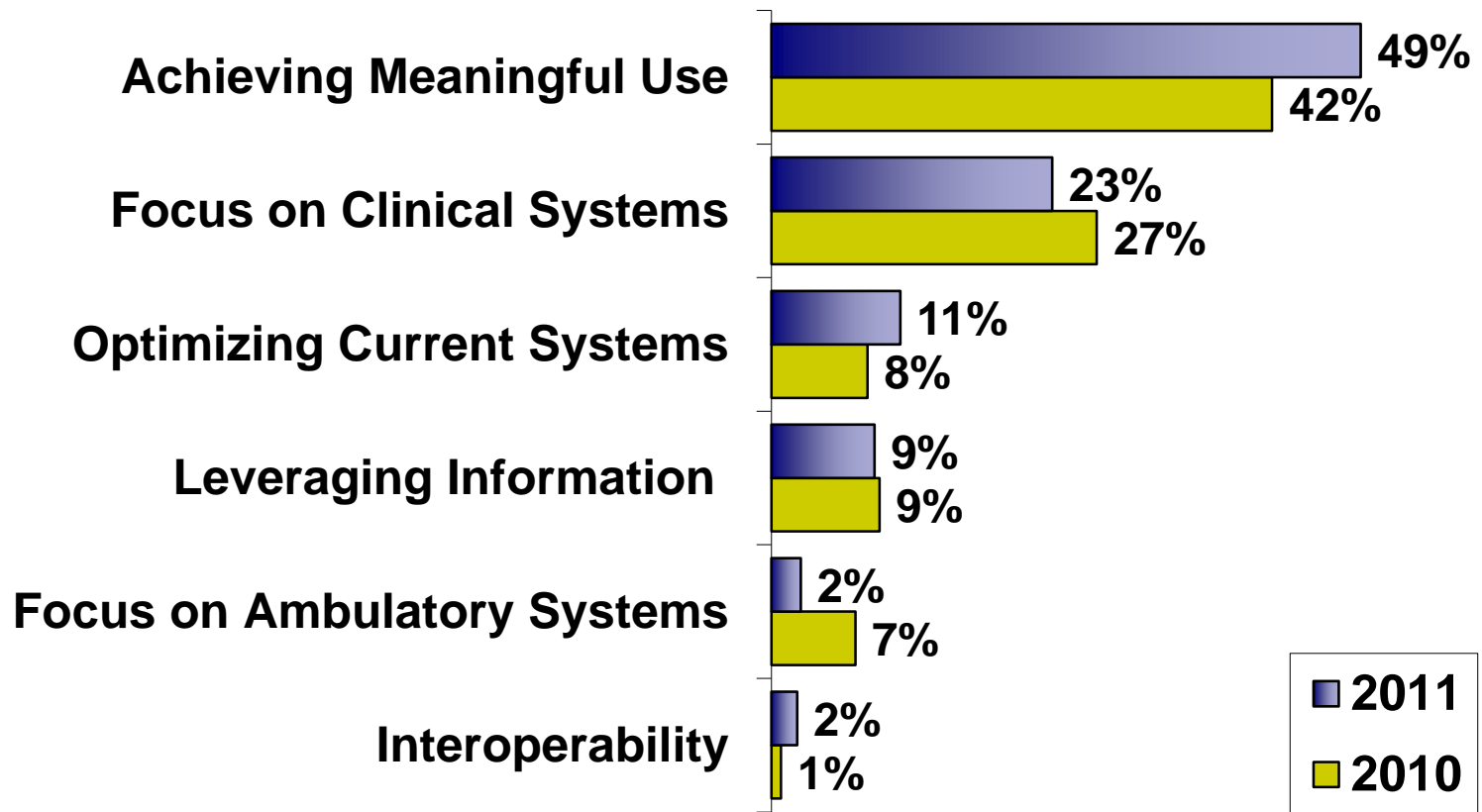Source; Advani, P. Nursing Executive Center, 2010

Implications for the HIT Workforce

- Technology is the greatest tool available to transform and innovate the delivery of nursing care

- Technology solutions exist today that can:
  - Eliminate repetitive and mundane tasks and improve the care environment
  - Improve safety and efficiency

- Greater input in development and testing of technology by nurses will speed adoption and reduce learning curve
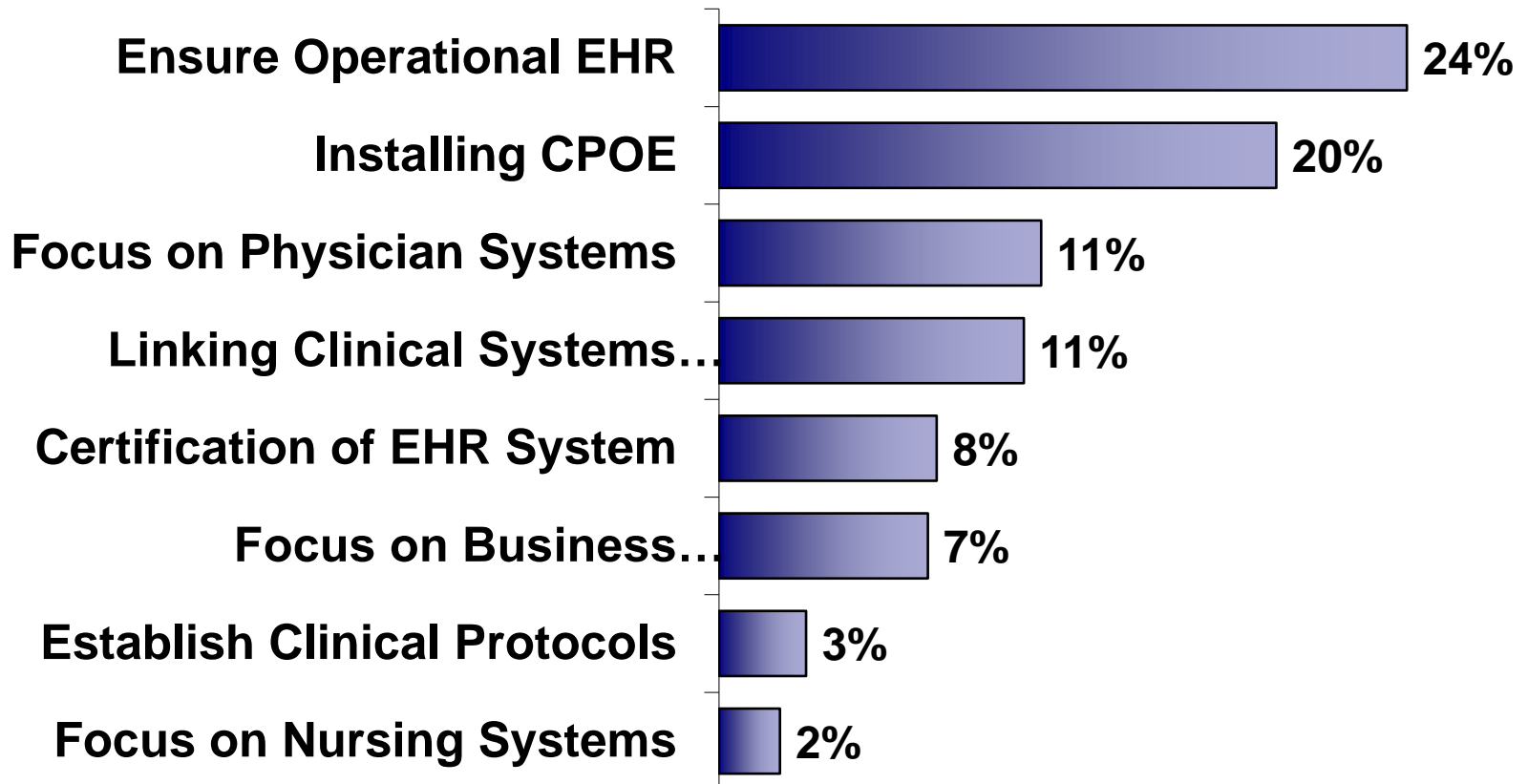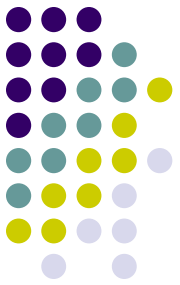
Source; Cipriano, P. , Nurse Scholar in Residence, IOM 2011

22nd Annual HIMSS Leadership Survey Top IT Priority—Next Two Years

Achieving Meaningful Use
- 49%
- 42%

Focus on Clinical Systems
- 23%
- 27%

Optimizing Current Systems
- 11%
- 8%

Leveraging Information
- 9%
- 9%

Focus on Ambulatory Systems
- 2%
- 7%

Interoperability
- 2%
- 1%

Legend:
- 2011
- 2010

Sponsored by Citrix Systems
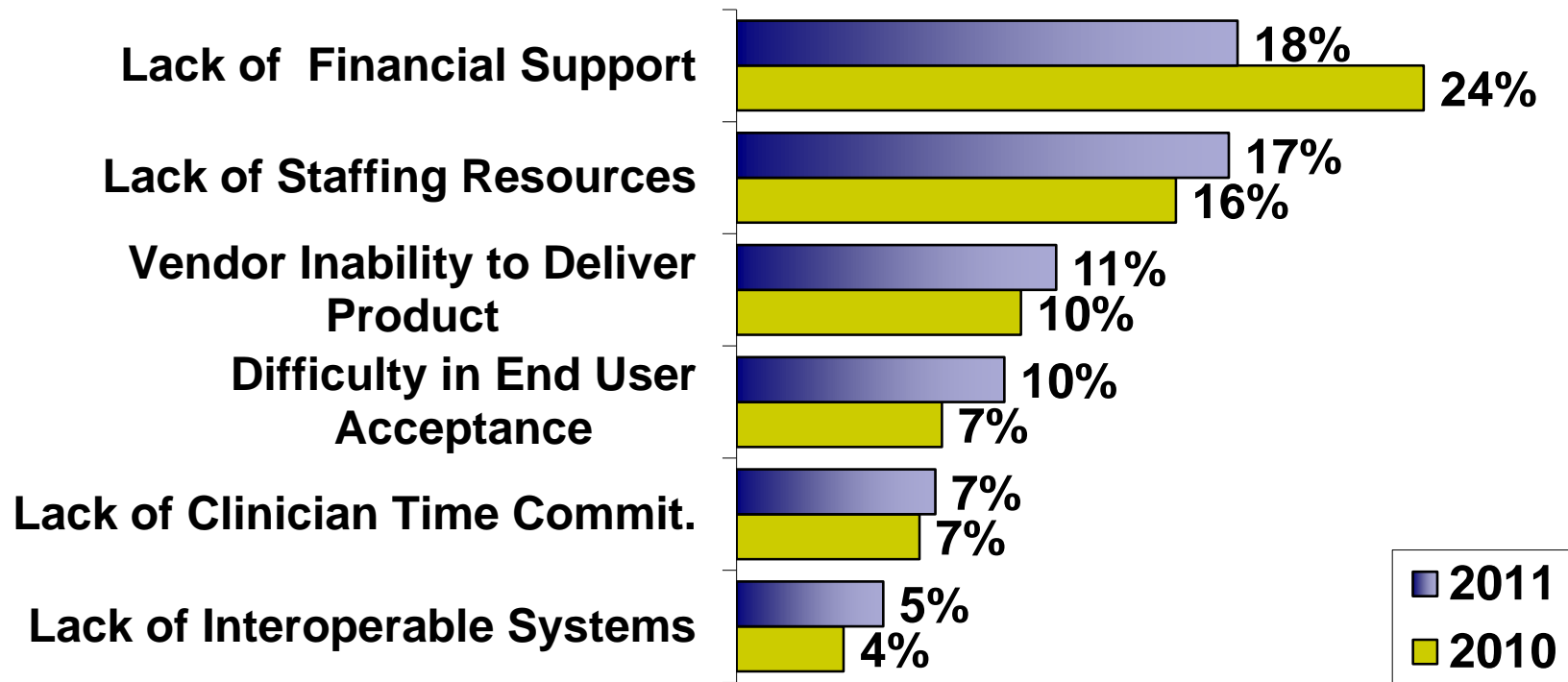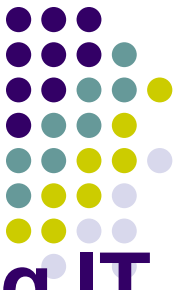
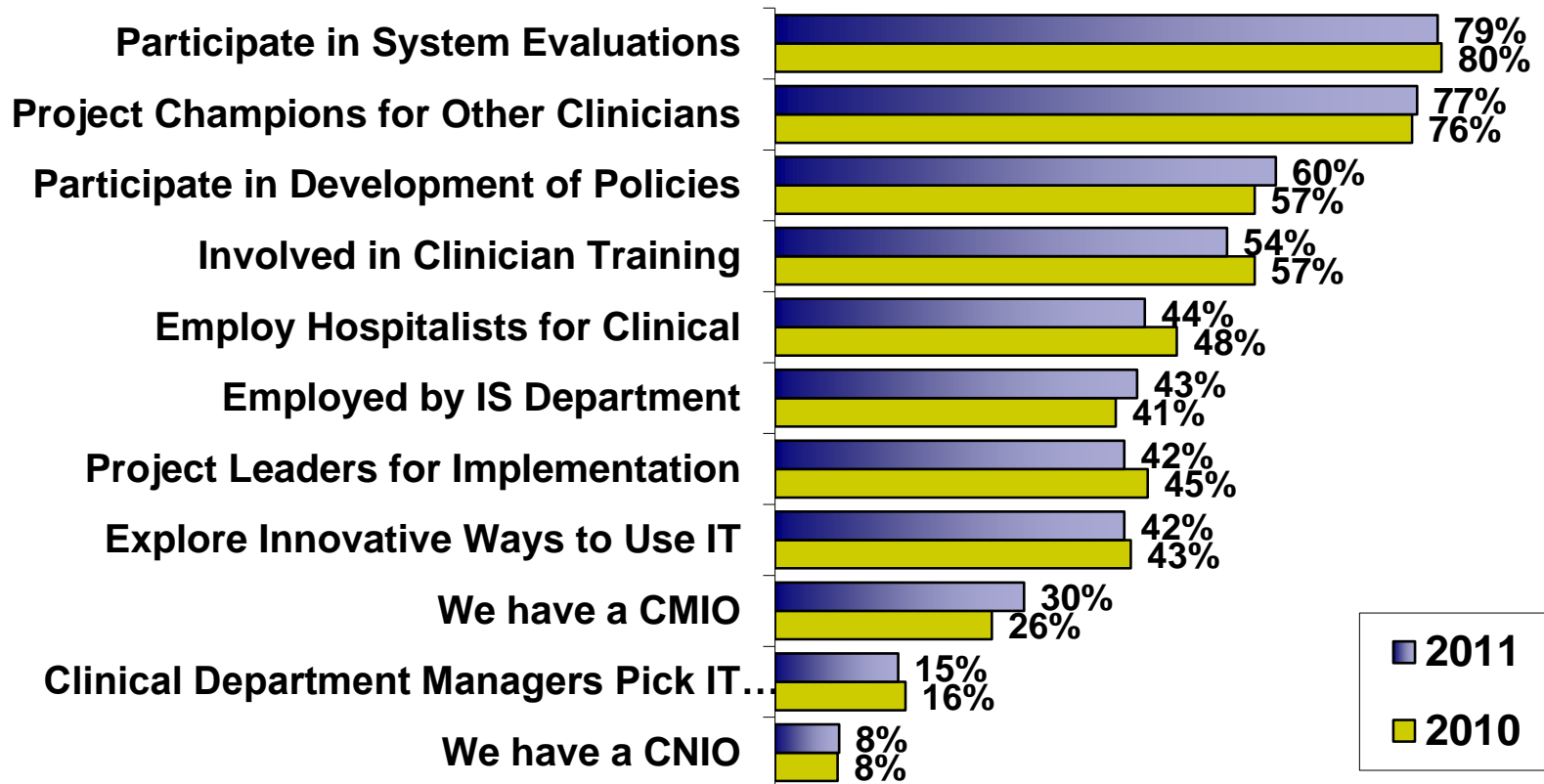# 22nd Annual HIMSS Leadership Survey Primary Clinical IT Focus

Sponsored by Citrix Systems

22nd Annual HIMSS Leadership Survey
Most Significant Barriers to Implementing IT

Lack of Financial Support
- 18% (2011)
- 24% (2010)

Lack of Staffing Resources
- 17% (2011)
- 16% (2010)

Vendor Inability to Deliver Product
- 11% (2011)
- 10% (2010)

Difficulty in End User Acceptance
- 10% (2011)
- 7% (2010)

Lack of Clinician Time Commit.
- 7% (2011)
- 7% (2010)

Lack of Interoperable Systems
- 5% (2011)
- 4% (2010)

Legend:
- 2011
- 2010

22nd Annual HIMSS Leadership Survey
Role of Clinicians

Role	2011	2010
Participate in System Evaluations	79%	80%
Project Champions for Other Clinicians	77%	76%
Participate in Development of Policies	60%	57%
Involved in Clinician Training	54%	57%
Employ Hospitalists for Clinical	44%	48%
Employed by IS Department	43%	41%
Project Leaders for Implementation	42%	45%
Explore Innovative Ways to Use IT	42%	43%
We have a CMIO	30%	26%
Clinical Department Managers Pick IT…	15%	16%
We have a CNIO	8%	8%

22nd Annual HIMSS Leadership Survey 2011 IT Staffing Needs (Top Ten)

Staffing Need	Percent
Clinical Application Support	39%
Clinical Informaticist	24%
Network and Architecture Support	21%
Process/Workflow Design	17%
Clinical Transformation	15%
Systems Integration	14%
User Training	14%
Clinical Champions	12%
System Design	12%
IT Security	12%

Sponsored by Citrix Systems
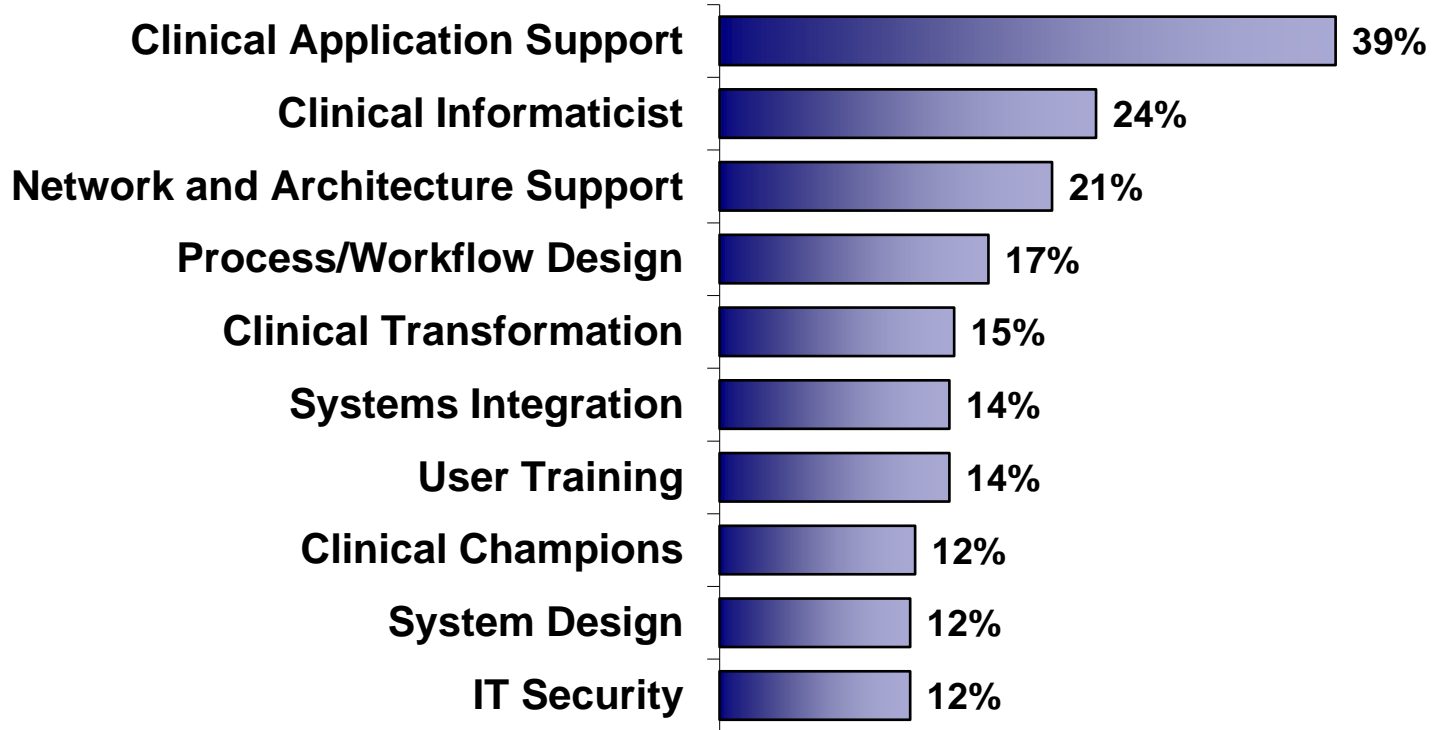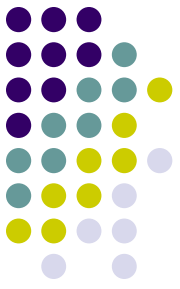
Areas in Which Healthcare Organizations Lack Qualified Candidates

Industry Staffing Needs

Legend:
- Clinical Informatics
- Implementation Expert
- Software Maintenance Expert
- Executive
- Consultant
- Network Professional
- System Security
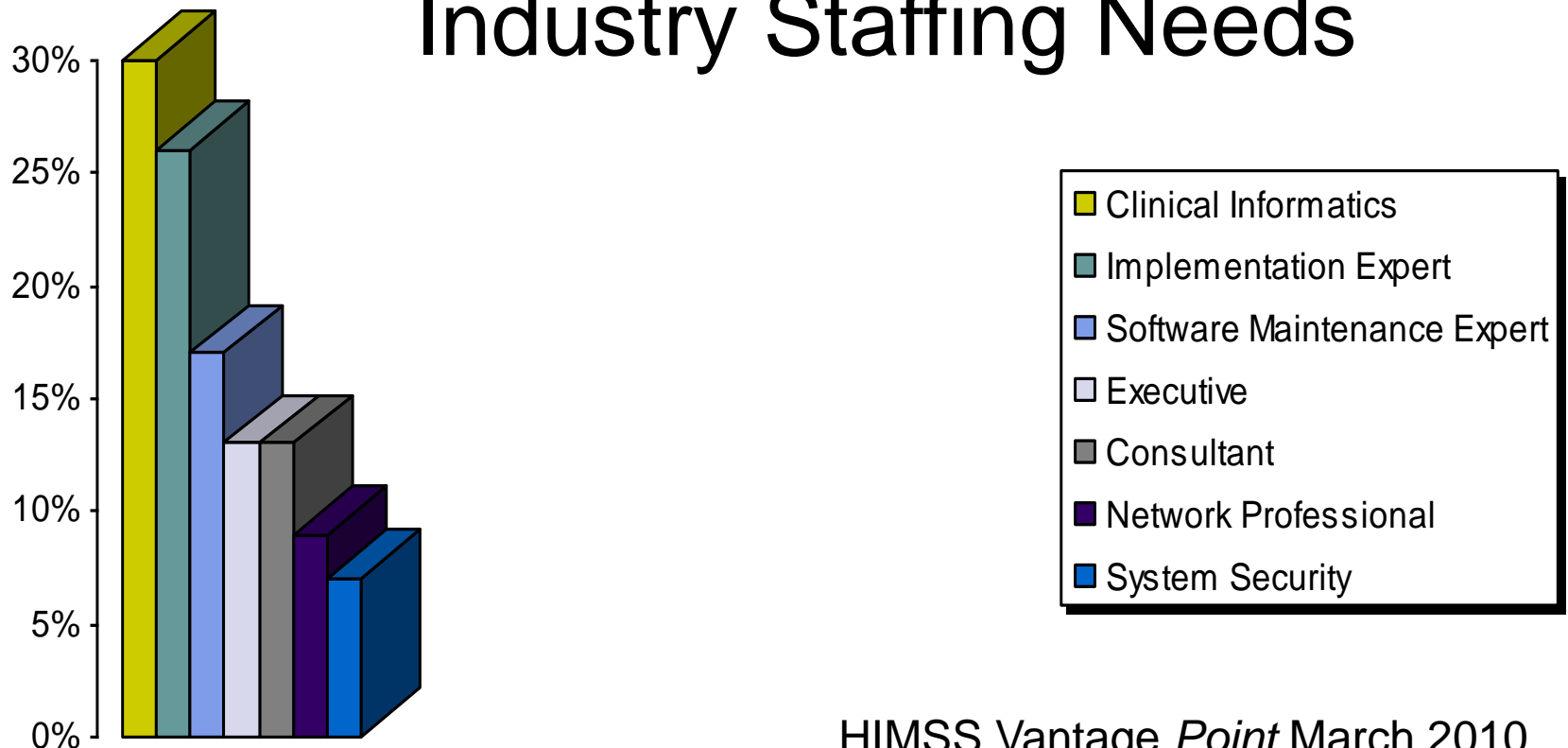
HIMSS Vantage *Point* March 2010

149 Respondents

2011 NI Workforce Survey
Top Three Job Responsibilities

Job Responsibility	2011 Results	2007 Results	2004 Results
Systems Implementation	57%	45%	67%
Systems Development	53%	41%	52%
Quality Initiative		21%	25%
Liaison		32%	32%
Strategic Planning		16%	15%
Informatics Education		15%	23%
Vendor Communication		13%	13%
Nursing Education			N/A

660 Respondents

☐ **2011 Results**   ■ **2007 Results**   ☐ **2004 Results**
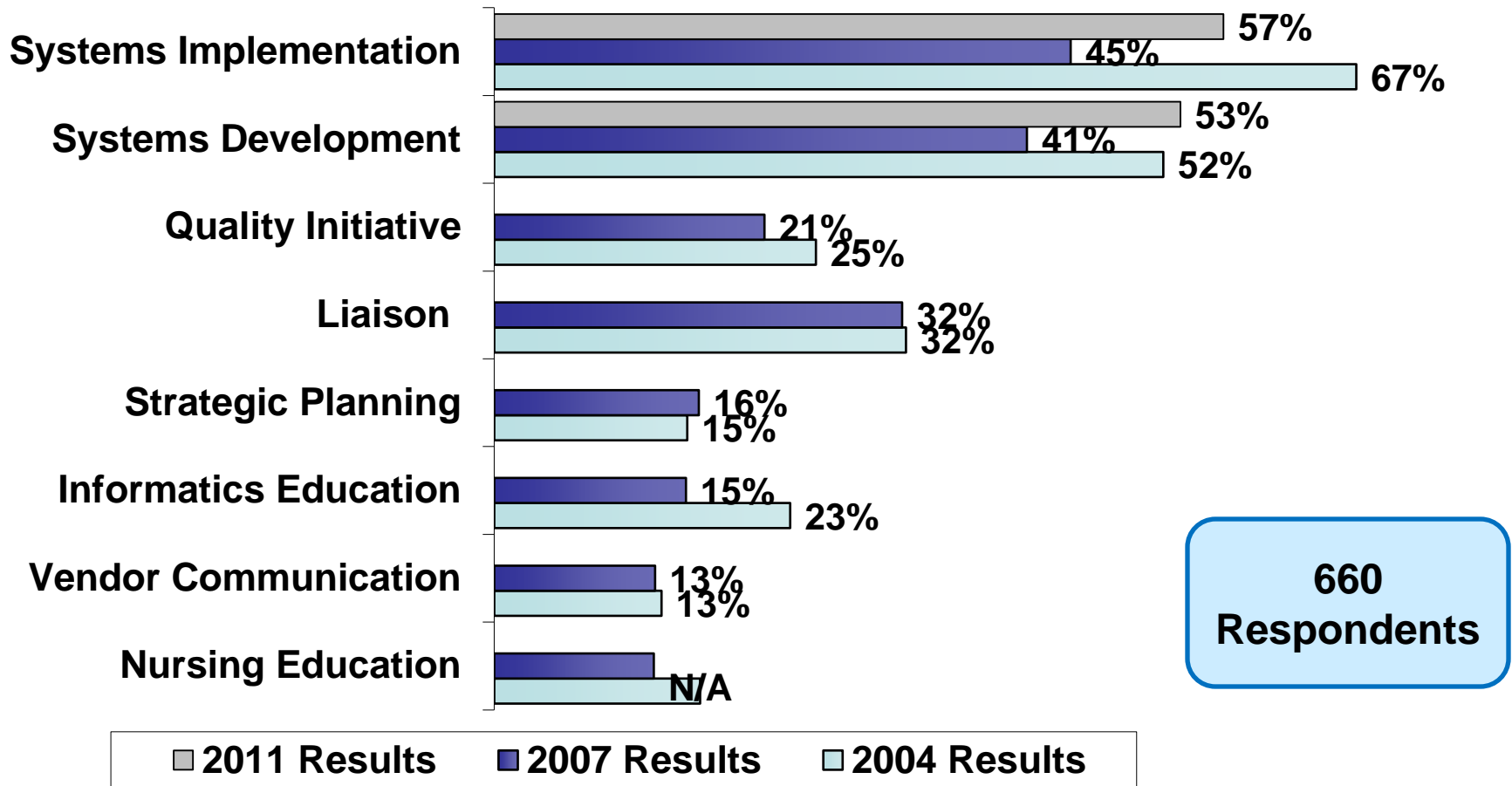
Data from the 2011 HIMSS Nursing Informatics Workforce Survey
© HIMSS

2011 NI Workforce Survey Largest Barrier to Success

Availability of Financial Resources — 65% (2007), 18% (2004)
User Acceptance — 29% (2007), 16% (2004)
Lack of Integration — 24% (2007), 7% (2004)
Organizational Strategic Plan — 21% (2007), 9% (2004)
Staffing Levels — 20% (2007), 7% (2004)
Administrative Support — 19% (2007), 16% (2004)
Software Design — 15% (2007), 12% (2004)
Time Management — 11% (2007), 0% (2004)

■ 2007 Results   □ 2004 Results
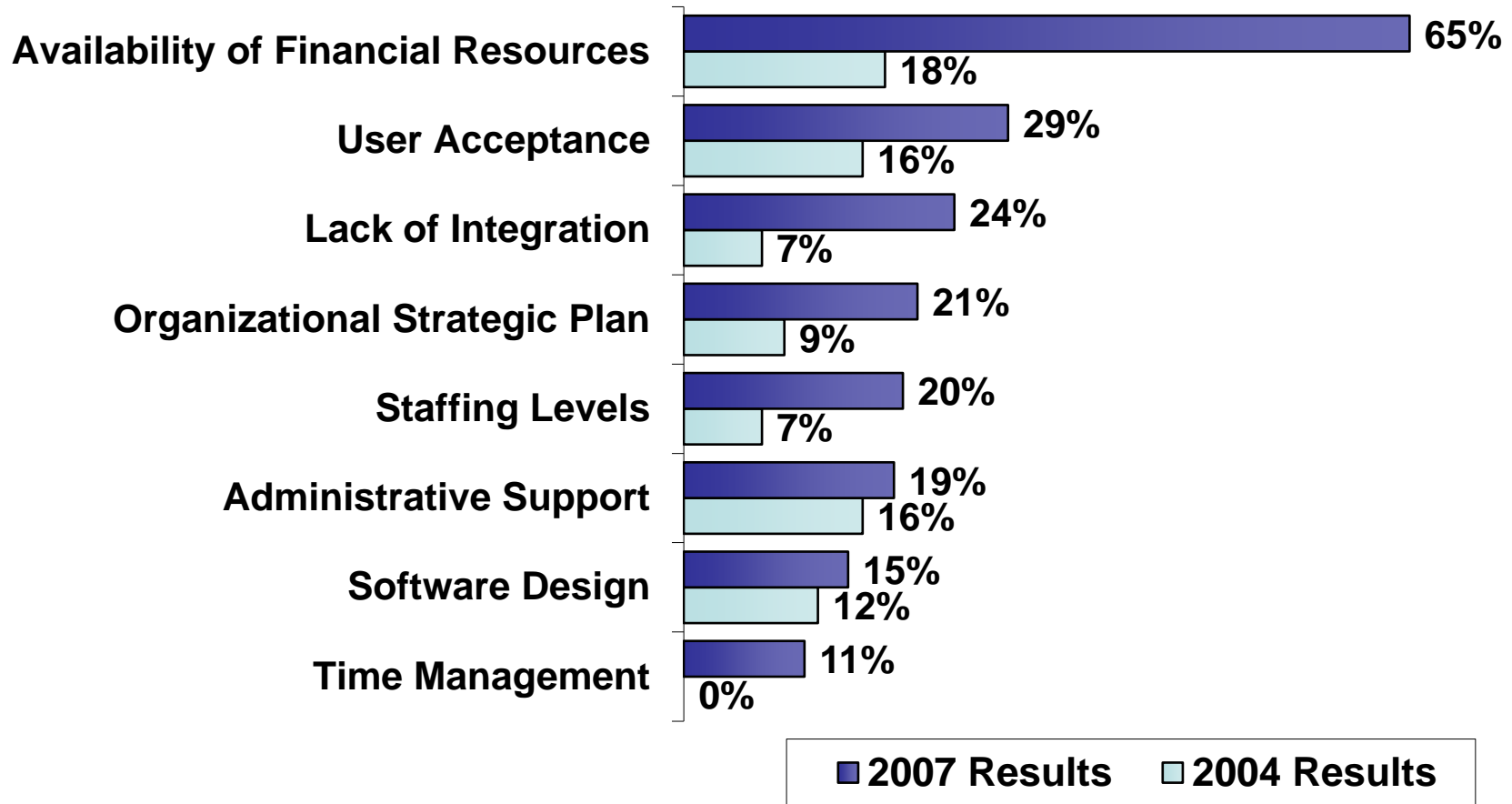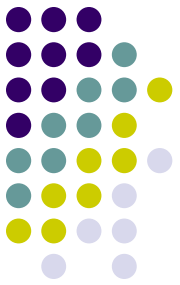
Data from the 2011 HIMSS Nursing Informatics Workforce Survey
© HIMSS

Patient Protection and Affordable Care Act (ACA)

- Builds on changes in the ARRA

- Establishes a Patient Bill of Rights

- Provides one-stop-shopping for healthcare insurance needs at a federal government website

HealthCare.gov

- Begins work with the States on state-based insurance plans

- HHS to develop tools and leverage technologies to empower consumers and clinicians to take more control of consumer's healthcare needs

Nursing and the Empowered Consumer

The Internet-empowered "Informed patient" will level the relationship between patient and clinician to one of equal partners in decision-making and care management

Expert clinical knowledge is no longer the sole domain of the health professional

Transition from patient orientation to a consumer orientation changes what people want from their providers, healthcare organizations and systems

Source: Nursing and Informatics for the 21st Century (2010) Second Edition
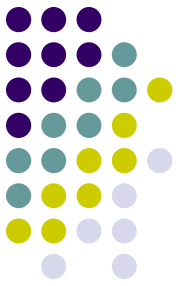
Empowered Consumer??

- 86 % of consumers don't access their medical records electronically

- Only 14% said they currently access their medical records electronically

- Nearly half (49%) call the doctor's office to request paper medical records

- Is this due to providers' inability to provide the records electronically or consumers' lack of awareness of available tools?
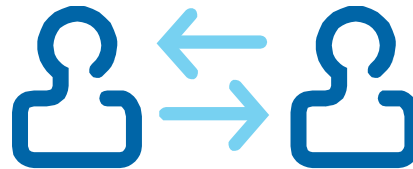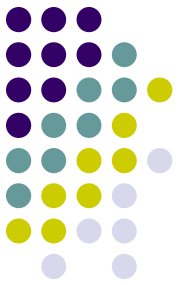
Where are Consumers Getting Health Information?

- **12%** Consumer-driven organizations (e.g., Patients Like Me, Daily Strength, Angie's List)

- **16%** Health service and manufacturing companies (e.g., Johnson & Johnson, Mayo Clinic)

- **16%** Government organizations (e.g., Centers for Disease Control and Prevention, Food and Drug Administration)

- ***56% Media/information service companies (e.g., Dr. Oz, The Doctors, iVillage, WebMD)***

Source: PwC Health Research Institute: Top health industry issues (2010)

eHealth Initiative's Top Trends for 2011

- The combination of:
  - National dialogue on healthcare
  - Meaningful Use criteria
    - Incentives toward patient engagement
  - Variety and maturation of digital patient engagement tools
    - Smart devices, patient portals

2011 is the tipping point for patient engagement!

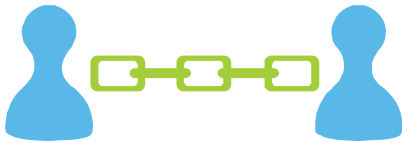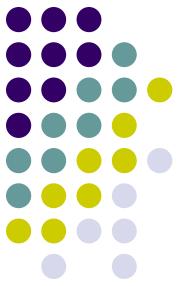# The Evolution to Patient-Centered Care

Potential Consumer Roles:

Acting as Agents of Change

Participating in Shared Decision-Making

Verifying Facts and Providing Context

**Integrating Better Health into the Full Context of Their Lives**

The Medical Home

> *"A patient-centered, comprehensive approach to care that coordinates all facets of a patient's care and medical history"*
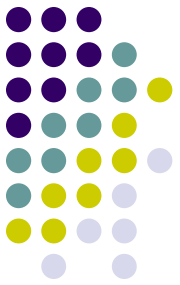
Makes patients active participants in treatment decisions and improves communication between a patient's health care providers

Source: PennLive: Rising Trends in Healthcare (2011)
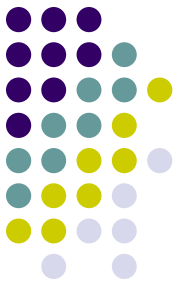
PHRs Making Slow Progress

- Four in five U.S. adults believe that online Personal Health Records (PHRs) would be beneficial in managing their health and healthcare

- 10 percent of the public has a form of electronic PHR

- PHR Types:
  - Stand-alone
    - Health data populated by the consumer
  - Tethered to an EMR system
    - Controlled by physicians
  - Non-tethered
    - Internet-based PHRs largely controlled by consumers
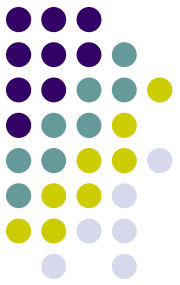
- 20 Internet-based PHRs on the market as of Feb. 2010

Source: Markle Foundation (2010). Markle survey on Health in a Networked Life.

The Value of Patient Portals

Providers report saving:

- 63 cents every time they don't have to mail a lab result (HealthPartners)

- $17 every time they can handle a billing query online rather than by phone, and $7 for every appointment scheduled online (NorthShore University Health System)

- 25% reduction in # of patients who have to come into the office for a surgical follow-up visit (Geisinger Health System)

Source: Gardner, E. (2010). Will patient Portals Open the Door to Better Care?

Objectives

- Describe current informatics issues and the impact on clinical leaders
- **Explore practical strategies for successful EHR adoption and optimization**
- Envision the future of nursing and technology

Named in honor of **Dr. Nicholas E. Davies -** an Atlanta-based practice physician committed to the ideal of improving patient care through better health information management

Encourages and recognizes excellence implementation of EHR systems

- Implementation
- Strategy
- Planning
- Project Management
- Governance
- Value and ROI
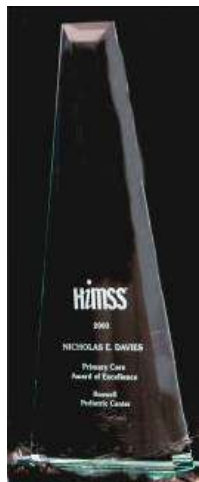
Program Objectives

➢ Promote the vision of EHR systems through concrete examples

➢ Understand and share documented value of EHR systems

➢ Provide visibility and recognition for high-impact EHR system

➢ Share successful EHR implementation strategies

Awards given – as of 2010

1995 – Organizational Awards (29 recognized)
2003 – Ambulatory Awards (21 recognized)
2004 – Public Health Awards (14 recognized)
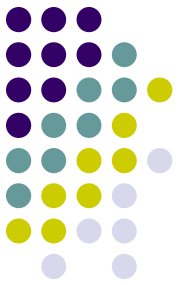2008 – Community Health Organization Awards (7 recognized)

Return on Investment Examples
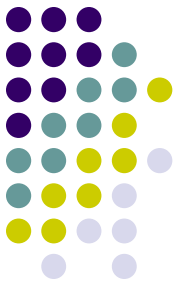
- Hard ROI
  - NorthShore Healthcare saw a $2.5 million increase in revenue after solidly linking charge capture directly with orders
  - Wayne Obstetrics reported that time devoted to document patient encounters decreased by four hours a week while its patient volume increased 225 percent
  - NorthShore Healthcare reduced reliance on paper forms saving $1.94 million a year in printing and procurement costs
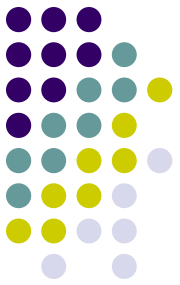
Return on Investment Examples

- Soft ROI
  - Queens Health Network experienced 50% fewer pharmacists interventions in medication orders in ambulatory care because of improved legibility, systems alerts and more complete prescriptions
  - Citizen's Memorial physicians could send a "Message to Nursing" with specific instructions or information on a patient
  - Ohio State University Health System found after its implementation that it could better comply with institutional policies regarding do-not-resuscitate orders, restraint orders and advance directives

Getting ROI out of Clinical Systems

- **NorthShore Healthcare** implemented an EMR with CPOE capability at three hospitals and 50 outpatient clinics/offices - - 2004 Davies Award Winner

  System users = 6,200

  - Number of delays in administering medication has fallen by 70%

  - Omitted administration of drugs has dropped 20%

  - Test results for mammograms now take one day, down from as long as three weeks

  - Cardiographics reports also take one day, down from as long as 10 days

  - Spent $7.5 million on training and $35 million capital on hardware, software, and implementation

EMR Adoption Model^{SM} 2009 – 2010

		2009 Final	2010 Final
Stage 7	Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP	0.7%	1.0%
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	1.6%	3.2%
Stage 5	Closed loop medication administration	3.8%	4.5%
Stage 4	CPOE, Clinical Decision Support (clinical protocols)	7.4%	10.5%
Stage 3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	50.9%	49.0%
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable	16.9%	14.6%
Stage 1	Ancillaries – Lab, Rad, Pharmacy – All Installed	7.2%	7.1%
Stage 0	All Three Ancillaries Not Installed	11.5%	10.1%

Change Management Strategies for an Effective EMR Implementation
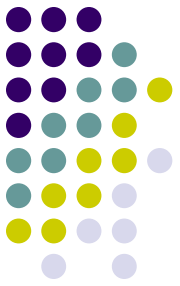
- Leadership
  - Establishing a Foundation for Change
- Willingness
  - Building commitment
- Ability
  - Developing Requisite Skill

Source: McCarthy, C. & Eastman, D., Change Management Strategies for an Effective EMR Implementation, 2010
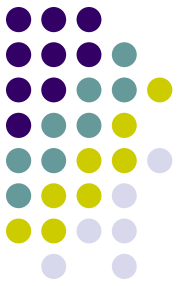
The Business Case for Change Management

"EMR technology disrupts the status quo, and along with the many opportunities it promises, it also brings a whirlwind of seemingly never-ending changes, which can have an entirely different effect on different people"

Source: McCarthy, C. & Eastman, D., 2010

Change Management Defined

The human-focused work of engaging and preparing people to succeed in the new world of EMRs

"A process designed to deal directly and intentionally with the human factors involved in not just planning and implementing an EMR, but guiding the behavioral change to achieve the anticipated benefits"

ANALYSIS
SOLUTION
PROCESS
OBJECTIVES
TEAMWORK
VISION
SALES

Source: McCarthy, C. & Eastman, D., 2010

A Word about Resistance..

- Don't focus too much energy on the resisters

- Some of them may need to go away

- Treat resisters with respect, listen to them and get them involved

- Focus the majority of your efforts on the people who want to succeed
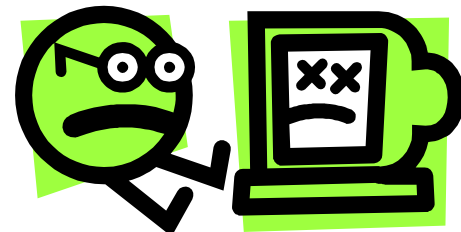
Training Strategies

- An effective user training program is user-centric, meaning it is role and workflow based, not system based

- Demonstrate relevant workflows in the new EMR system

- Highlight critical system skills

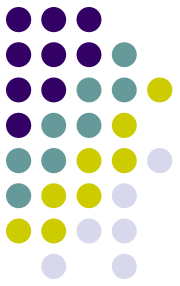- Put energy into ensuring users are comfortable in their roles and able to use the system efficiently
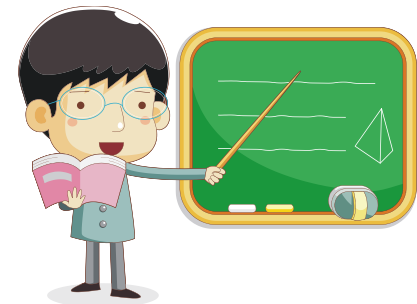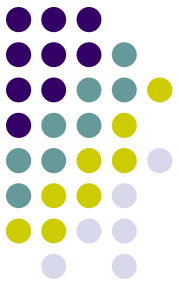
Objectives

- Describe current informatics issues and the impact on clinical leaders
- Explore informatics strategies to achieve patient centered care
- **Envision the future of nursing and technology**

The TIGER Initiative Foundation

- **NEW TIGER Website** @ www.thetigerinitiative.org

- Forming a 501c3 independent entity with initial support from HIMSS

- Partnerships and Collaborations growing in Nursing, Interdisciplinary and Allied Health to over 100 groups interested

- *Nursing Informatics: Where Technology and Caring Meet* Book Published (Thanks to Marion Ball and TIGER Editors)

Envision the Future of Nursing & Technology

The Alliance for Nursing Informatics (ANI) is a collaboration of organizations that represents a unified voice for Nursing Informatics, sponsored by AMIA and HIMSS
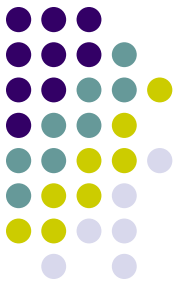
ANI represents more than 5,000 nurses, bringing together 28 separate nursing informatics groups that function separately at local, regional, national and international levels

Each of these organizations has its own established programs, publications and organizational structures for its members

Source: ANI Testimony to the October 2009 Forum on the Future of Nursing

# The Future of Nursing: Leading Change, Advancing Health

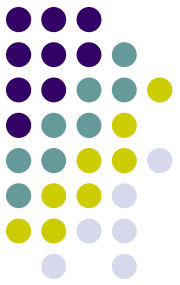Nurses constitute the largest segment of the nation's health care workforce at 3.1 million

In their front-line roles, nurses can play a vital role in helping realize the objectives set forth in the 2010 Affordable Care Act

A number of barriers prevent nurses from being able to respond effectively to rapidly changing health care settings and an evolving health care system

These barriers must be overcome to ensure that nurses are well-positioned to lead change and advance health
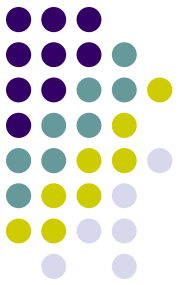
1) Nurses should practice to the full extent of their education and training

2) Nurses should achieve higher levels of education and training through an improved education system that promotes seamless academic progression

3) Nurses should be full partners, with physicians and other healthcare professionals in the redesigning of health care in the United States

4) Effective workforce planning and policy making require better data collection and an improved information infrastructure

Implications for Informatics

Nurses must be supported by a healthcare environment that adequately enables their knowledge-based work as:

- Leaders in the Effective Design and Use of EHR Systems
- Integrators of Patient Information
- Full Partners in Decision Making
- Care Coordinators Across Disciplines
- Advocates for Engaging Patients and Families
- Contributors to Standardize EHR Infrastructure

Source: ANI Testimony to the October 2009 Forum on the Future of Nursing
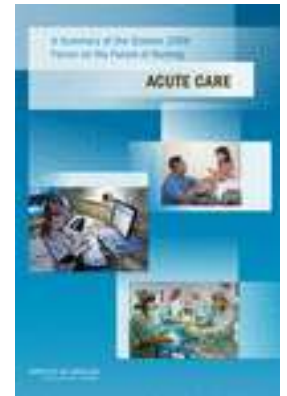
Improving Nursing Care Through Technology
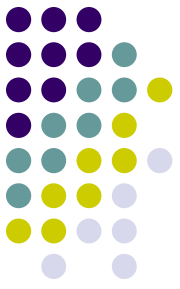
- Technologies can create better work environment for inpatient nurses:
  - Improve efficiency, safety and quality
  - Add value to the way nurses coordinate and provide care
    - Alarm/event messaging
    - Biomedical device integration
    - Medication administration

Source: California HealthCare Foundation, www.chcf.org, 2008

Improving Nursing Care Through Technology

- Nurses do not want to be passive consumers of technology

- Nurses want devices that are integrated, voice activated, handheld, use biometrics, provide translation, are portable, are wireless, auto populate, and are "smart"

- Greater nurse satisfaction leads to greater patient satisfaction

Source; Cipriano, P. , Nurse Scholar in Residence, IOM 2011

Time and Motion Study
How Nurses Spend Their Time

7.2% of nursing practice time is spent on **patient assessment**

17.2% of nursing practice time is spent on **medication administration**

27.5% of *all* reported nurse time is spent on **documentation**

Nurses spend **30.8%** of their time **in the patient rooms** and **38.6%** of their time at the **nurse station**

During a typical **10-hour day,** a nurse travels **1-5 miles**

Closed Loop Medication Delivery System Workflow

CPOE

Medication Order Verification
Pharmacy Management System

Clinician Views Orders on Handheld or in EHR

Bar Coding of Drugs
(Re-Packaging)

Clinician Retrieves Medication from Cabinet

Completed Electronic Documentation sent to eMAR/EHR

Clinician Confirms Infusion Order and Begins Infusion via Smart Pump

Clinician Scans Medication to Verify 5 Rights
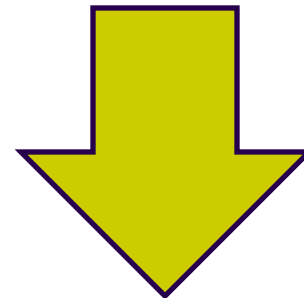
Clinician Scans Patient ID

AHRQ Study on Bar-Code Technology with eMAR

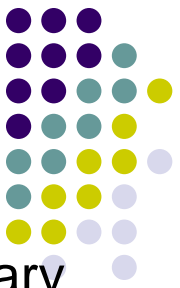Reduces Medication Administration Errors (such as wrong dose)
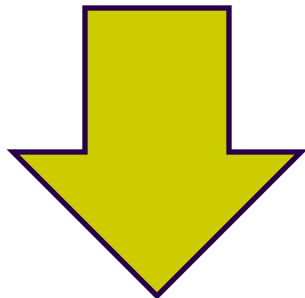
Reduces Timing Errors (an hour or more off schedule)

41 percent reduction

27 percent reduction

Source: New England Journal of Medicine, 2010

Bedside Monitoring Device Integration (BMDI)

- Ascension Health and Kaiser Permanente created inter-disciplinary teams, removing internal silos and engaging the C-suite to get more time back to nurses

- Example: Bedside Monitoring Device Integration at Ascension Health

PAN-ZigBee Network Device Proximity Measured to 3 Centimeters of Bed

Cerner Millennium 2007

Basic Bed Data

For Beds:
Pt Weight
HOB
Turn Assist
Alarms/Alerts
Response Times

Cerner CareAware (NaviCare Pt Safety Integrated)

Cerner MD Bus

Hill-Rom Connectivity Hub Mounted & Powered on Bed

RS 232

RS 232

RS 232

Patient Monitors IV Pumps Ventilators

Source: Hendrich, A. 2008

Growth in the Nursing Market

Nursing Applications with Highest Expected Purchase Rates for Hospitals over the Next 24 Months

- Nursing Documentation
  - Supports quality outcomes reporting
  - Makes CPOE more effective
    - Vital signs
    - Flow sheet data
- eMAR
  - Closed Loop Medication Administration
 - Impact on patient safety

Source: HIMSS Analytics™ Database 2009

Transforming Practice through Technology & Informatics will:
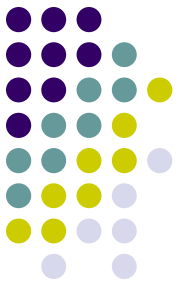
- Improve safety and efficiency
- Free clinicians from tasks
- Bring evidence for decisions to point of care
- Empower patients to be involved in care
- Enable nurses to:
  - Integrate data into health information
  - Consult in the home, LTC, Assisted living
  - Coordinate care across settings

Source; Cipriano, P. , Nurse Scholar in Residence, IOM 2011

Leading Change, Advancing Health
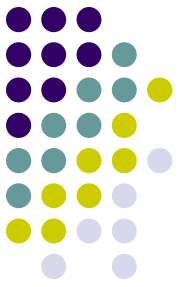
- Knowledge Management
  - Who, what, when, where, how
- Process Management
  - Scheduling and management of routine tasks
  - Process optimization
- Clinical and Business Intelligence
  - Forecasting trends and future needs
  - Suggesting process solutions
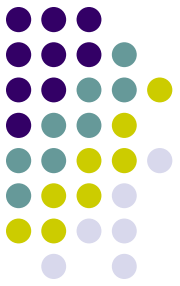 - Clinical decision support
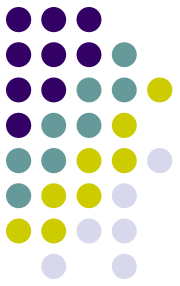
Current State of the Art - Laboratory
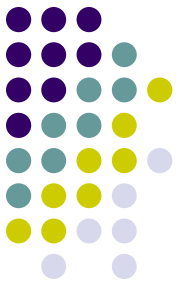
Source: Felder, R. A., 2010

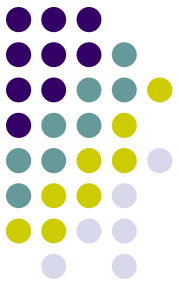# The Future in Automation - Laboratory

Source: Felder, R. A., 2010

Leading Change, Advancing Health… through Informatics

Together we can advance the national agenda to lead change and create value with innovation to ensure better quality healthcare in the U.S.

Questions?????

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Resources and References

➤ Alliance for Nursing Informatics

http://www.allianceni.org

➤ Clinical Informatics

http://www.himss.org/ASP/topics_clinicalInformatics.asp

➤ Davies Award Program

http://www.himss.org/davies/

➤ HIMSS Analytics EMR Adoption Model

http://www.himssanalytics.org/hc_providers/emr_adoption.asp

➤ HIMSS Nursing Informatics Community

http://www.himss.org/ni

➤ Institute of Medicine - The Future of Nursing

http://www.iom.edu/Reports/2010/The-Future-of-Nursing-Leading-Change-Advancing-Health.aspx