

Advancing Nursing Advancing the Nation's Health

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Visioning Nursing's Preferred Future

When Nursing Succeeds, Health Care Succeeds

- Initiative on the Future of Nursing
- Health IT enabling Quality Improvement
 - Better care
 - Better health
 - Better value
- Harnessing the power of technologies for Clinical Transformation

Institute of Medicine The Future of Nursing

Report released
October 5, 2010

National Campaign
for Action Launched
November 30, 2010



Landmark Report

A blueprint to:

- Ensure that nurses can practice to full extent of their education and training
- Improve nursing education
- Provide opportunities for nurses to assume leadership positions and to serve as full partners in health care redesign and improvement efforts
- Improve data collection for workforce planning and policy-making

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**INITIATIVE ON THE FUTURE
OF NURSING**

Four Key Messages

#1) Nurses should be able to practice to full extent of their education and training

- Need to remove scope-of-practice restrictions for APRNs
- Need nurse residency program to better manage transition from school to practice

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Four Key Messages

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

- More BSN-trained nurses
- ADN-to-BSN and ADN-to-MSN programs
- Increase student diversity to create workforce prepared to meet demands of increasingly diverse patient population

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Four Key Messages

#3) Nurses should be full partners with physicians and others in redesigning U.S. health care

- Foster leadership skills and competencies
- Nurses must see policy as something they shape

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Four Key Messages

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

- Need balance of skills and perspectives among physicians, nurses and others
- Need more specific workforce data collection both within and across professions

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The Future of Nursing

Leading Change, Advancing Health

Eight Recommendations:

Evidence Based

Blueprint for Action

1. Remove Scope of Practice Barriers

- APRNs must be able to practice to the full extent of their education and training
- All nurses and other health care providers must also assume full scope.

Implications for Technology:

- *Qualify as an eligible provider for meaningful use incentives*
- *Continue to generate evidence supporting quality outcomes (collect, synthesize, analyze quality data)*
- *Use technology to enable better workflows*

2. Expand opportunities for nurses to lead and diffuse collaborative improvement efforts

- Nurses must assume leadership positions to conduct research, redesign and improve practice environments and health systems, then diffuse successful practices

Implications for Technology:

- *Engage nurses with developers and manufacturers in the design, development, purchase, implementation, and evaluation of medical/health devices and HIT products*
- *Generate and apply research findings to improve use of technology to improve care and efficiency*

3. Implement nurse residency programs

- Support nurses' completion of a transition-to-practice program (residency) after completing pre-licensure or advanced practice degree program when transitioning into new clinical practice area

Implications for Technology:

- *Utilize electronic tools for education, simulation, evaluation, and reporting of outcomes of transition programs*

4. Increase proportion of nurses with BSN degree to 80% by 2020

- Academic leaders should partner to ensure funding, monitor progress, and increase diversity of students for future workforce

Implications for Technology:

- *Fully utilize distance education, simulation, and telehealth capabilities to pool faculty resources and reach more students*
 - *Asynchronous, self-paced learning opportunities*
 - *Employer on-site distance learning capabilities*

5. Double the number of nurses with a doctorate by 2020

- With support from private and public sources, academic leaders, and accrediting bodies, add to the cadre of nurse faculty and researchers with attention to increasing diversity

Implications for Technology:

- *Use technology to enable accelerated graduate degrees for nurses to increase production of master's and doctoral nurse graduates*
 - *Collaborative research networks*
 - *Improved access to large data sets*

6. Ensure that nurses engage in lifelong learning

- Collaborate to ensure nurses, students, and faculty continue their education to gain competencies needed to provide care for diverse population across the lifespan

Implications for Technology:

- *All students and nurses will need to demonstrate technology competencies to maintain cutting-edge practice, teaching, and research*
- *Engage personal technologies to facilitate learning programs (just-in-time, asynchronous; point of care)*

7. Prepare and enable nurses to lead change and advance health

- Nurses are prepared to assume leadership positions at all levels—ensure the positions are there!

Implications for Technology:

- *Maximize use of technology for personal and professional growth; stay connected and informed*
- *Use EHRs to build and leverage the knowledge and evidence base for nursing care that improves outcomes*
- *Nursing informatics experts lead delivery model transformation through application of health IT*

8. Build an infrastructure to collect and analyze health care workforce data

- Improve research and the collection of data on health care workforce requirements; data must be timely and accessible to the public

Implications for Technology:

- *Promulgate a standardized minimum data set across states and professions*
- *Establish a monitoring system with most current analytics to mine data and project nursing workforce requirements as new needs evolve*

The Future: Technology Transforming Nursing Practice

- Identification and testing of new and existing technologies intended to support nursing decision-making and care delivery
- Capture costs and benefits of a range of care technologies intended to support nursing decision-making and care delivery
- Identify the contributions that various health care professionals make to the design and development, purchase, implementation and evaluation of devices and information technology products
- Develop a measure of “meaningful use” of HIT by nurses

The Future: Nurses Transforming Health Care

- Yesterday: *Devices*
 - Better, more rapid diagnoses
- Today: *Devices and Systems*
 - Better data capture, and improving workflow, safety, and learning
- Tomorrow: *Learning Systems and Ubiquitous and Pervasive Computing*
 - Leverage EHRs/Health IT to achieve better outcomes and transform care delivery

National Health IT Perspective

- President's Council of Advisors on Science and Technology (PCAST), December 2010

Realizing the Full Potential of Health Information Technology to Improve Healthcare for Americans: The Path Forward

- Conclusion--information technology can help catalyze a number of important benefits
 - Improved access to patient data
 - Streamlined monitoring of public health patterns and trends
 - Enhanced ability to conduct clinical trials
 - Creation of new high-technology markets and jobs
- HIT can also help support a range of healthcare related economic reforms

National Health IT Perspective

IOM Roundtable on Value & Science-Driven Health Care

Goal: By 2020, 90% of clinical decisions supported by accurate, timely, and up-to-date clinical information reflecting best available evidence.

Vision: to help advance the development of a learning health system in which evidence is generated in a timely manner by capturing results of the care process, and applied effectively and efficiently to ensure best care practices.

- *Digital Infrastructure for the Learning Health Care System: The Foundation for Continuous Improvement in Health and Health Care* December, 2010

Intersection of Health IT and Quality

- Quality Measures

Improve Quality

Value based payments will lower costs

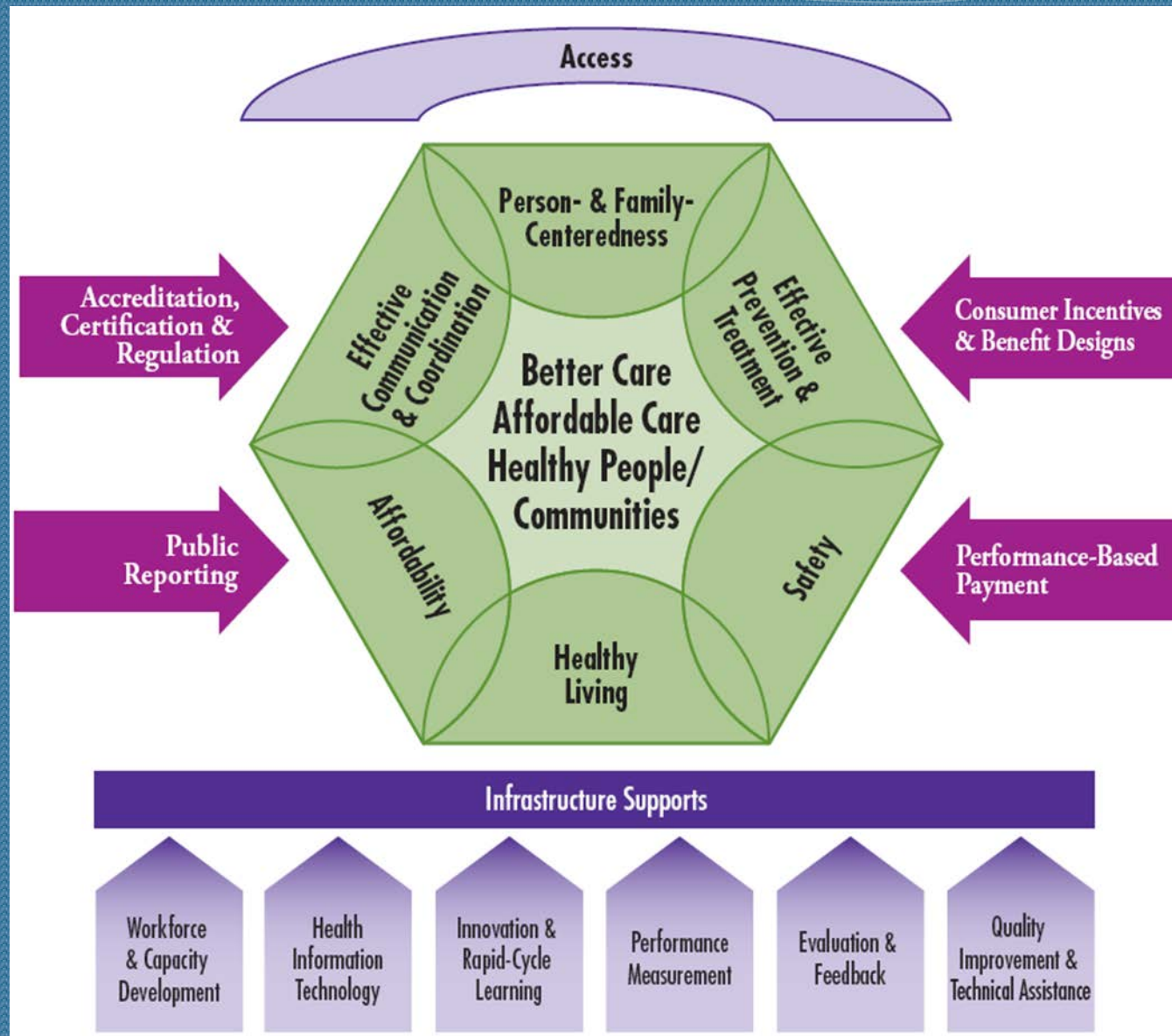
- Meaningful Use

Improve health by changing practice based on outcomes

National Quality Strategy

- **Better Care:** Improve the overall quality--more patient-centered, reliable, accessible, and safe.
- **Better Health (Healthy People/Healthy Communities):** address behavioral, social and, environmental determinants of health; deliver higher-quality care
- **Affordable Care:** reduce the cost of quality health care for individuals, families, employers, and government

National Quality Strategy



National Quality Strategy—Role of Health IT

- Build a system that supports clinical practice, research, public health, and health of individuals
- Make health information exchange a reality
- Expand the use of EHRs
- Promote better use of health IT by engaging clinicians, employers, consumers, and others
- Demonstrate that health information technology improves quality.

Partnership for Patients

- Public-private partnership established in 2011 that will help improve the quality, safety and affordability of health care for all Americans
- Goal: make hospital care safer, more reliable, and less costly

Partnership for Patients

Alarming status:

- 1 in 20 patients has an infection acquired during the course of care
- 1 in 7 Medicare beneficiaries experiences harm during hospitalization (\$4.4 billion annually)
- Nearly 1 in 5 Medicare beneficiaries is readmitted to the hospital within 30 days (2.6 million seniors; \$26 billion/year)

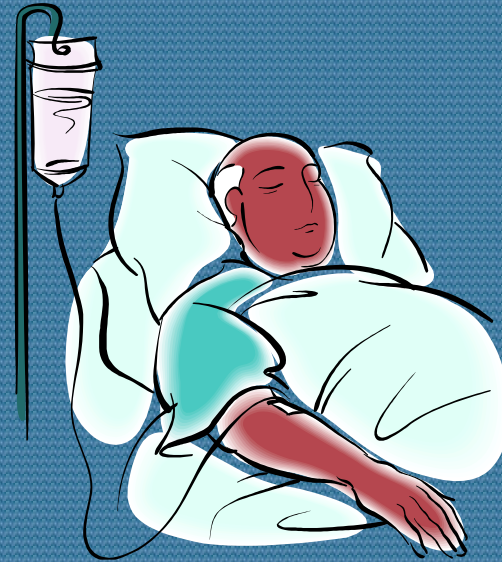
Partnership for Patients

Better Care, Lower Costs

- *Keep patients from getting injured or sicker.* By the end of 2013, preventable hospital-acquired conditions would **decrease by 40%** compared to 2010.
 - 1.8 million fewer injuries to patients
 - more than **60,000 lives saved** over the next three years.

Partnership for Patients

- *Help patients heal without complication.* By the end of 2013, a 20% decrease in hospital readmissions (related to a complication during a transition across care settings) from 2010
 - more than 1.6 million patients recovering from illness will not suffer a preventable complication requiring re-hospitalization within 30 days of discharge



Partnership for Patients

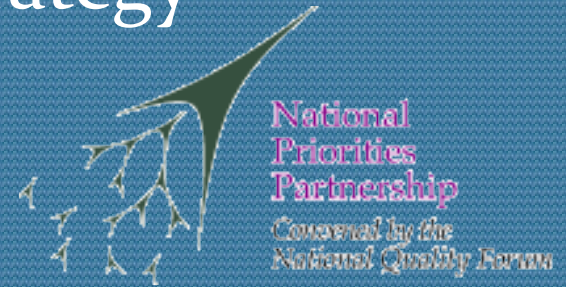
- Hospital Engagement Networks (HEN)
 - 26 sites funded (state, regional, or national hospital system organizations)
 - \$218 million in funding
 - identify and spread proven solutions to reduce hospital acquired conditions to other hospitals and providers
 - Develop learning collaboratives to improve safety
- Additional \$10 M for development of a patient safety curriculum for HENs as well as activities to engage patients and families to help advance the Partnership aims

Partnership for Patients

- Improving care transitions
 - Reducing complications occurring during transitions in care requires collaboration
 - Medication errors, poor communication, poor coordination are key factors
- Community Care Transitions program
 - \$500 M from Affordable Care Act 4/11
 - Community-based organizations eligible
 - Health care and social services provider can propose a Medicare fee for service payment for care transition—must meet unique community needs

National Priorities Partnership

Advise HHS on national quality strategy



Priorities:

- **Patient and Family Engagement**
 - Engage patients and families in managing their health and making decisions about their care.
- **Safety**
 - Improve the safety and reliability of America's healthcare system
- **Care Coordination**
 - Ensure patients receive well-coordinated care within and across all healthcare organizations, settings, and levels of care

National Priorities Partnership

- **Palliative and End-of-Life Care**
 - Guarantee appropriate and compassionate care for patients with life-limiting illnesses
- **Equitable Access**
 - All have access to affordable, timely, high-quality care
- **Overuse**
 - Eliminate overuse and ensure appropriate care
- **Population Health**
 - Improve the health of the population
- **Infrastructure Supports**
 - Tools such as health IT to address needed underlying system changes necessary to attain all priority area goals

National Priorities Partnership

Nursing and the National Priorities Partnership: Aligning Efforts to Transform America's Healthcare

- Role of HIT
 - Enable evidence-based practice
 - Support public reporting through quality measurement
 - Enhance work design to increase efficiency and effectiveness
- HIT is the “steel thread running through the 8 priorities”
- Potential for EHRs to transform health care with widespread adoption

National Priorities Partnership

Nursing and the National Priorities Partnership: Aligning Efforts to Transform America's Healthcare

- Challenges for EHRs
 - integration of current evidence into HIT systems
 - data entry requirements
 - unclear priorities for what should be measured
- Future goals for HIT:
 - real-time capture of data related to quality measurement
 - standardized nursing vocabularies
 - clinical decision support with nursing research findings to reflect best practices

Hospital Inpatient Value-Based Purchasing Program

- Affordable Care Act
- Launched April 29, 2011
- Effective FY 2013
- \$850 million available
- Reward hospitals for the quality of care they provide to Medicare recipients; help reduce costs
- First shift from reimbursement for volume

Hospital Inpatient Value-Based Purchasing Program

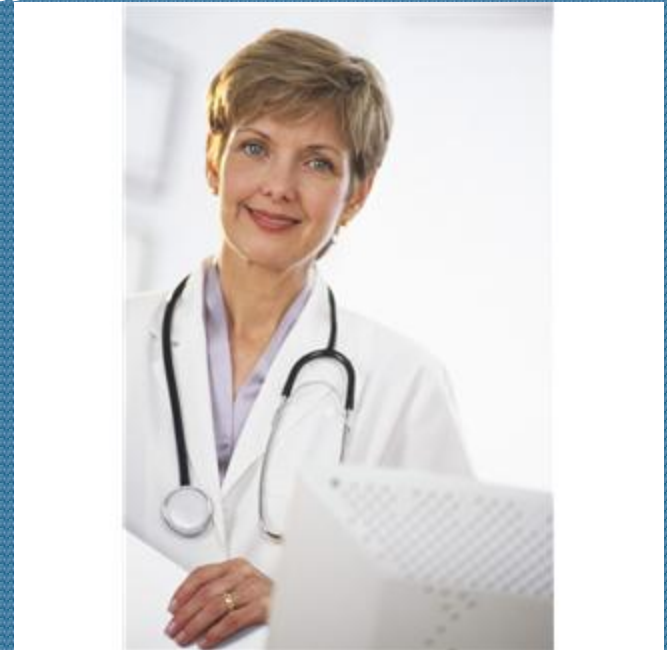
- Sample Initial Measures:
 - Heart attack care within 90 minutes
 - Prevent DVT in surgical patients within 24 hours
 - HF patients receive discharge instructions
 - Hospital facilities are clean and well maintained
- Future measures:
 - Enhanced patient experience
 - Best clinical practices
 - Improved outcomes
 - Prevention of hospital acquired conditions

Accountable Care Organizations “ACOs”

- Shared savings program based on coordinating care from primary care to end of life, and improving value (↓ costs)
- ACOs would have to meet quality standards in four domains:
 - patient/caregiver care experiences
 - care coordination and patient safety
 - preventive health
 - at-risk population/frail elderly health

Leading Edge Technologies: Bringing Value to Nurses and Patients

- Technology makes care safer and more efficient
 - Removes human potential for errors
 - Provides for a single set of clinical data
 - Saves time
 - Saves money
 - Saves lives



Nurses provide care *everywhere* but...

while the technology to support the care and enhance workflow exists in some places, it is *not* everywhere.

Then and Now

- Yesterday—technology improved diagnosis; early gains in safety (still evolving)
 - Point of Care Testing—bedside and “near patient”
 - Enhanced standard equipment such as stethoscopes, thermometers, glucometers, closed suctioning systems, etc.
 - Automated vital signs, sensors/probes
 - Automated delivery of fluids, medications
 - Life-Safety critical systems

Then and Now

- Today
 - Automatic capture and storage of patient data
 - Facilitate nurse's workflow
 - Moving and lifting equipment
 - Mobile devices for communication; documentation
 - Assisted decision making
 - Integrated alerts
 - Devices provide preventive care (positioning; alarms)
 - Just in time learning and resources delivered in various media
 - Technology permeates all settings

Technology Assisted Care

Nurses/Devices Collect Data 

Electronic Storage/Analytics 

Act on Data to Improve Quality

Understanding Workflow Improvements

(California HealthCare Foundation, 12/08)

Evaluate and improve workflow with application of technologies

- Organize work and incorporate clinical knowledge (evidence) and decision support at the point of care (improve safety and quality)
- Remove nurse from unnecessary chain of tasks (increase efficiency)
- Empower patients and others to assume new roles (interactive systems-improve efficiency)
- Route and prioritize messages and requests to enable immediate responses to patients and other caregivers/staff (improved communication increases safety)

Making Care Safer and More Efficient: The Business Case

SAFER

- Improved safety--reduced opportunities for error
- Improved system reliability
 - Medication administration
 - Communication among care givers
 - Timely acquisition of equipment/supplies
 - Patient identification
- Return RN to bedside for additional direct care time

EFFICIENT

- Reduce Nursing Demand by
- Eliminating waste in nursing workflow
 - Fewer Interruptions due to missing medication, supplies, equipment
 - Making information accessible
- Reduce physical burden of work to improve retention

How can new technology empower innovative approaches to transforming care?

- Capitalize on early adopters--drive change, get buy-in
- Technology should not fit the status quo (same as automating poor manual systems)
- Build on current capabilities but extend the boundaries (wireless, portable devices at the point of 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.

- **Selected Process
Transforming Technologies**

Wireless Communications

- Minimize multiple modes of communication
- Remove wasted time with fixed devices
- Access the right person
- Solutions: (need DAS-distributed antenna system)
 - VOIP (voice over Internet protocol)—uses wireless LAN
 - Point-to-point communication
 - Connectivity with other technologies
 - *Messaging or event-management middleware application*
 - *Messaging integration solution*
 - *Workflow communication solution*

Location Tracking & Awareness in Healthcare

1. Asset Tracking

- Clinical equipment
- Wheelchairs
- Beds
- Medical assets
- IT assets, WOWs



YTD ROI :

- Return on investment; less than 1 year

2. Staff tracking

- Process/workflow improvement
- Caregiver safety



3. Patient tracking

- Tracking patient flow through departments or processes
- Mental illness facilities- wanderers
- Nursing homes/elderly care



Real-time location systems--“RTLs”

- Coordinate patients' needs with equipment
- Coordinate & communicate with other staff
- Benefits



Eliminate “hunting and gathering” time and delays
Reduce equipment losses and “hoarding”
Redesign roles and responsibilities for equipment tracking
Greater efficiency for coordination of care

Wireless patient monitoring solutions--hospitals

- Technologies provide for continuous monitoring
- Integrated into bed, mattress pad
 - Weight measurement
 - BP, Heart rate, Respiratory rate
 - Body movement
- Integrates with nurse-call or other communication system to alert RN (converged wireless)



Smart Devices

Translation feature

Turning

Vibration/percussion

Motorized



Smart Technology

- When a machine performs as an intelligent person would
- Nurses can make any smart technology/system act dumb
- Does not replace critical thinking skills and nursing judgments

Medical Device Data Systems

- Push Technology

Example:

- Bar Code Medication Administration
 - Bar coded patient armband
 - Bar coded unit-dose medications
 - Electronic medication administration record (e-MAR)
 - Built in logic to match information from bar codes to patient med profile

Medical Device Data Systems: Bar Code Medication Administration

- Improved medication safety
 - Identify any discrepancy
 - Warn clinician
 - Legible information
 - Checks for duplicate orders; avoid missing medication
 - Identified allergy and drug interactions
 - Alerts check with latest lab values
 - Dosing alerts
 - Correct medication for patient, dose, route, time

Telehealth and m-Health (*mobile* Health)

- Telehealth
 - Embedded cellular connectivity in end-user devices
 - Links individual to a caregiver
- RPM = remote patient monitoring
- AAL = Ambient Assisted Living
- PRS = Personal emergency response system
- MPM = Mobile personal monitoring
- Remote Monitoring Centers follow patients at home

Medical Body Area Networks

- 40 MHz bandwidth allocated
 - 2360-2400 MHz (shared use with Aerospace industry)
- Benefits
 - Transmit variety of vital signs and data points
 - Full mobility of patient; can be adjusted by care givers
 - Alert providers before problems escalate
- Devices will require FDA approval

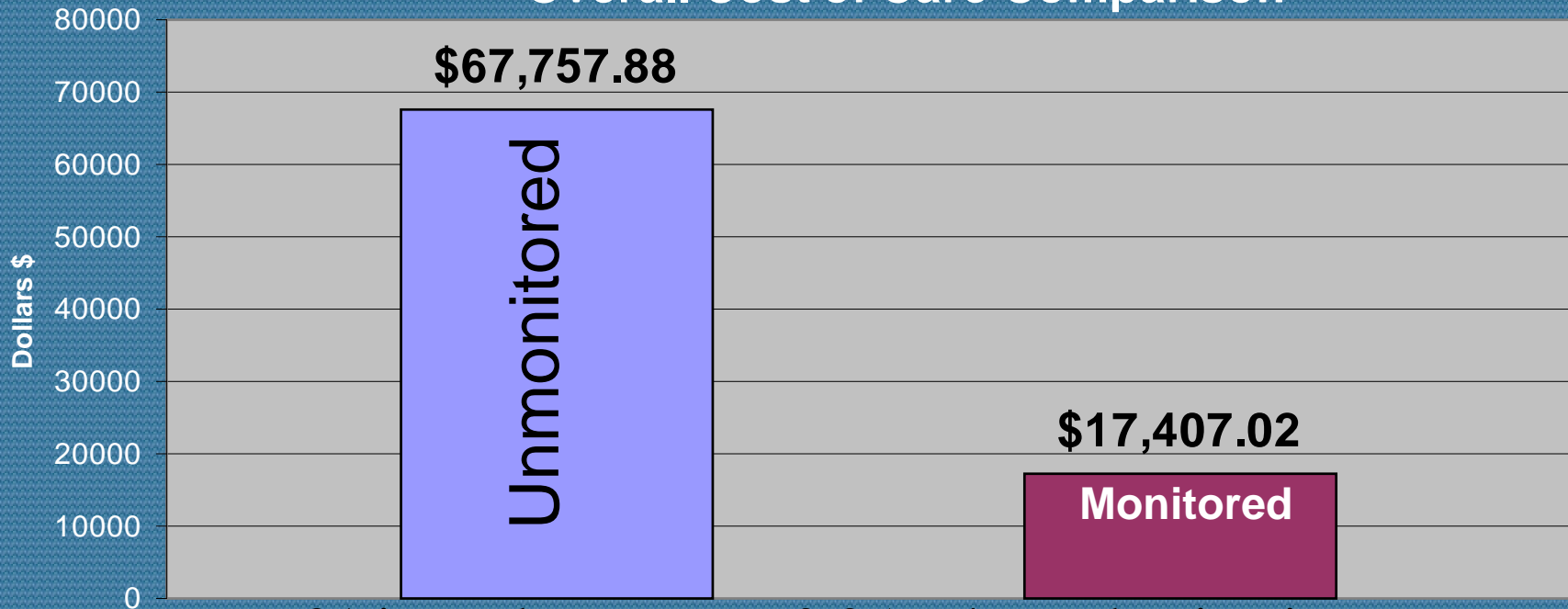
Wireless monitoring in the home

Effect of Telehome Monitoring

Passive monitoring of elders reduces cost of care by 74%

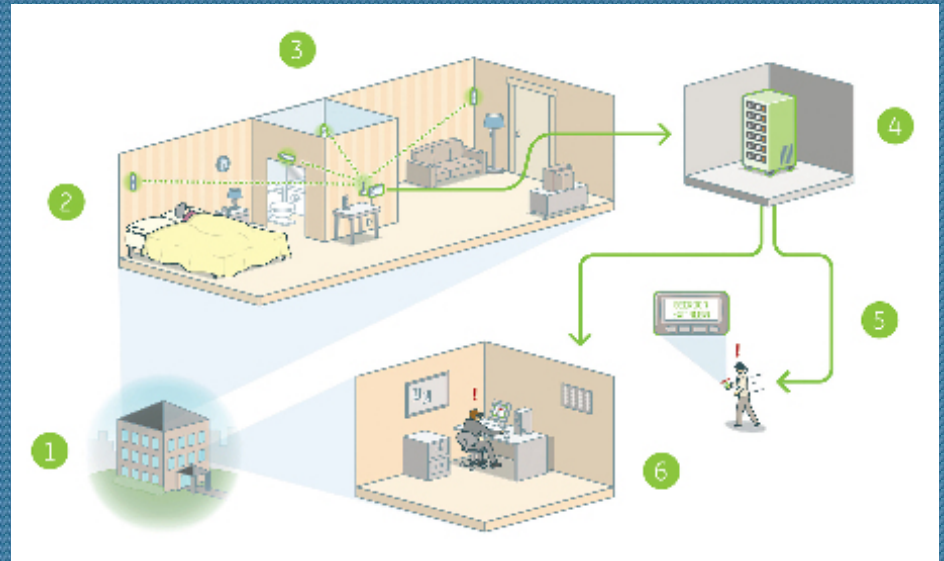
(Journal of Telemedicine and E-Health, 2007, 13(3): 279-286)

Overall Cost of Care Comparison



N=21 in each group, $P < 0.05$, 74% reduction in costs

Home network monitoring



Quiet Care System

(Living Independently Group and GE Healthcare)

Personal Home Monitoring PC based Chronic Care

“Home ClinQ” Collects data from multiple devices

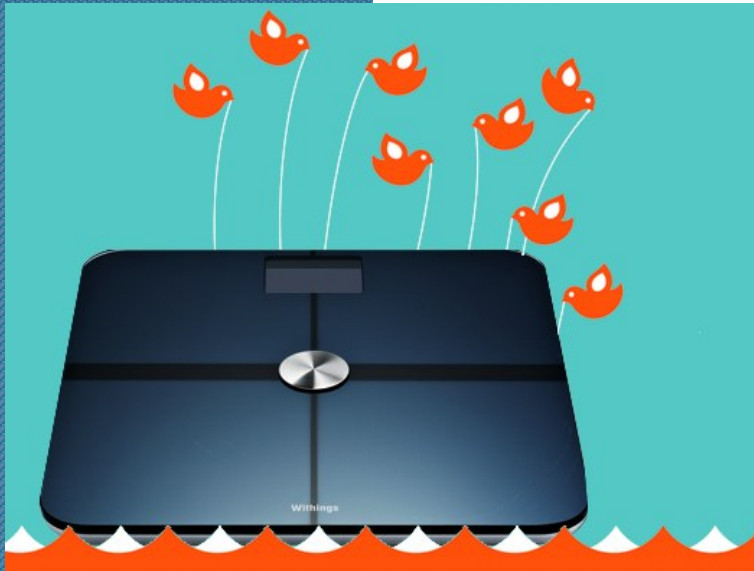


Scales with data upload

Tanita



LifeSource



BodyTrace



Withings—connects to Twitter

Sensors to monitor vital signs

AVIVO Mobile Patient Management System
(Corventis PiiX device)

Measures: heart rate and variations, respirations, fluid status, movements i.e. posture and activity



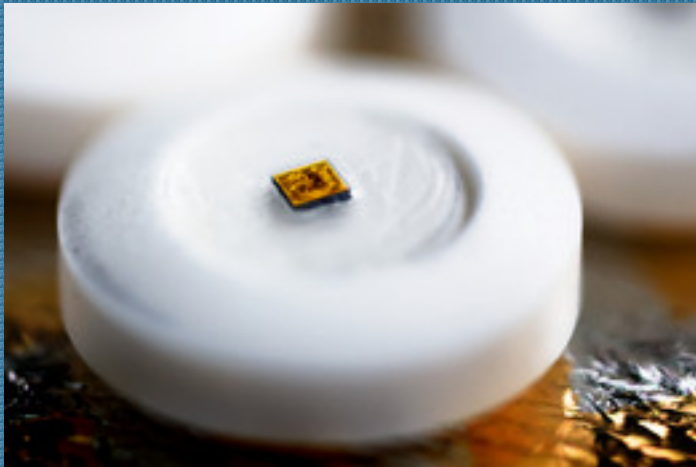
Pill bottles as Reminders

Vitality Inc.
Teams with
AT&T—cell phone
sends reminder



MedMinder
Smart Pill Box

Edible communication device



Proteus chip:
Sends message
that pill has been
ingested

Novartis

mHealthSmart Phone Applications

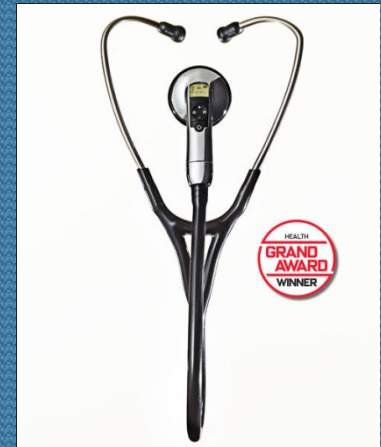
- “Augmented Reality”
- EMR
- Images (PACS)
- m-Health monitoring
- GIS software mapping (syndromic surveillance)
- Data interactivity
- Mobile testing (traditional; accelerometers)
- Video (learning reference apps)
- Clinical Guidelines
- Evidence based references

Gizmos and Gadgets--What else?

- AirStrip OB—real time remote access to fetal heart tracings, vital signs, notes, etc. (FDA approved) iPhone/BB
- Nanotechnology embedded into clothing



- Bang & Olufsen/3M stethoscope



- ED Wait times--free app updates q 5"

Gizmos and Gadgets—the future?

- Ford Motor Company—“the car that cares”
 - Digital Coach technology (Healthrageous)
 - “First Assist” (OnStar) emergency health care instruction
 - Glucose level monitoring and alerts (3-5 yrs; Medtronic)
 - Allergy app turns on air recirculation based on pollen counts (IMS Health)

Future development:

- Voice requests for health information and updates
- Seat sensors to detect electrical heart rhythms/problems
- Stress reduction responses

Building Nursing Knowledge

- Intellectual Capital
- Expert Knowledge-based Information Technology Tools
 - Best-practice data bases
 - Clinical data repositories
 - Electronic health records
 - Clinical decision support systems
 - Alerts
 - Point of care technologies

Informatics Infrastructure for Evidence-Based Practice

Building Blocks to support the building, accessing, and application of evidence in care settings

- Standardized terminologies and structures
- Digital sources of evidence
- Data exchange standards
- Informatics processes
- Informatics competencies

Bakken, S. (2001) An informatics infrastructure is essential for evidence-based practice. *Journal of the American Medical Informatics Association* 8(3), 199-201.

Evidence Based Practice: Optimizing Nursing Care

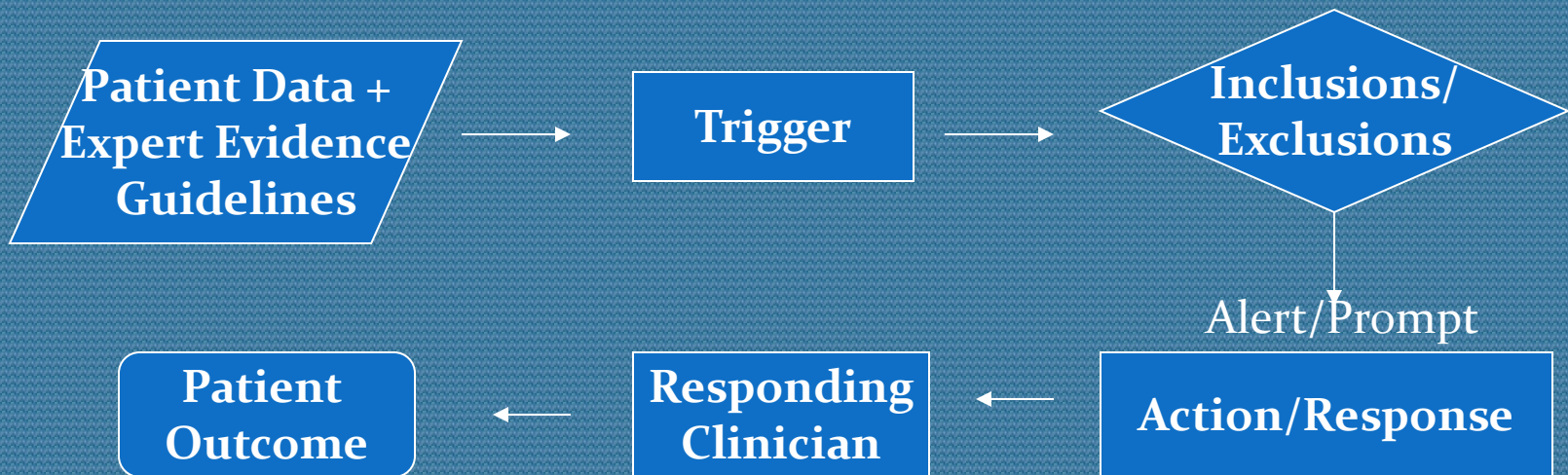
- Technology transforming and supporting workflow
- EHR as ultimate knowledge-based tool
- Decision support at the point of care
 - Push technology
- Medical device data systems--connectology

Clinical Decision Support

- Definition
 - Timely use of evidence-based knowledge in combination with patient or population specific information to improve care processes and outcomes
- Benefits
 - Increase adherence to guidelines and protocols
 - Expand surveillance and monitoring of disease conditions and health patterns
 - Reduce risks and prevent harm

Clinical Decision Support Data Use Model

- Contains data, information, and knowledge evidence
- Interdependent with other professionals



Embedded Nursing Knowledge: Quality Measures

Kaiser Permanente and the Department of Veterans Affairs collaborative initiated the “Tipping Point”

- Improve quality outcomes through evidence based nursing practice
- Measure the impact of nursing care on patient outcomes by capturing select data in EHR
- Embed quality measures sensitive to nursing care in meaningful use criteria for adoption

Embedded Nursing Knowledge: Quality Measures

- ANA taking the lead with Alliance for Nursing Informatics to introduce “**pressure ulcer prevention**” as a quality measure sensitive to nursing care for adoption in meaningful use incentives
- 3Million adults per year treated for pressure ulcers (hospital, LTC, home)
- Cost in excess of \$15Billion/year
- Goal to ↓Cost, ↓Patient and Staff burden
- Move from prevalence to *prevention*

From Then and Now to *Tomorrow*

- HIT Enablers—tomorrow's tools of the trade
 - Meaningful Use of EHRs
 - Clinical Decision Support
 - Data Repositories
 - Building Evidence
 - Creating New Knowledge
 - Mining data with analytics
 - Health Information Exchange
- Nursing and Team Quality Measures
 - Measure Applications Partnership
 - Cross Cutting Measures

From Then and Now to *Tomorrow*

- Ubiquitous and Pervasive Computing
- It's how you use the data
 - Care Transitions Coordination—the newest frontier
 - Tipping Point—Pressure Ulcer Prevention Measure
 - Consortium for Data Sharing
 - Patient and Care Giver Engagement/Activation
- Predicting the Best Outcomes
 - Big Data
 - Analytics
 - IBM “Watson”
 - Business Intelligence

Summary

- HIT and Leading edge technologies available today can:
 - Improve quality, safety and efficiency
 - Free clinicians from tasks
 - Bring evidence for decisions to point of care
 - Empower patients to be involved in care
 - Allow nurses to learn anywhere, any time
- With shift to mHealth nurses will:
 - Integrate data into health information
 - Manage chronic and acute conditions of outpatients
 - Consult in home, LTC, Assisted living
 - Use technology to expedite care

Summary and Key Actions

- Nurses are transforming care through use of Health IT across settings
 - Health IT is the enabler to measure and report about care and outcomes
 - Controversy and barriers will continue to pose challenges, but implementation of EHRs will continue as a primary health care transformation strategy
 - Acting on information about quality/outcomes, will enable transformation of payment systems (reliant on Health IT)
 - Nurses can and must be integral players shaping the future landscape