



Transformation Through HIT

AEI Briefing
Carolyn M. Clancy, M.D.
Director

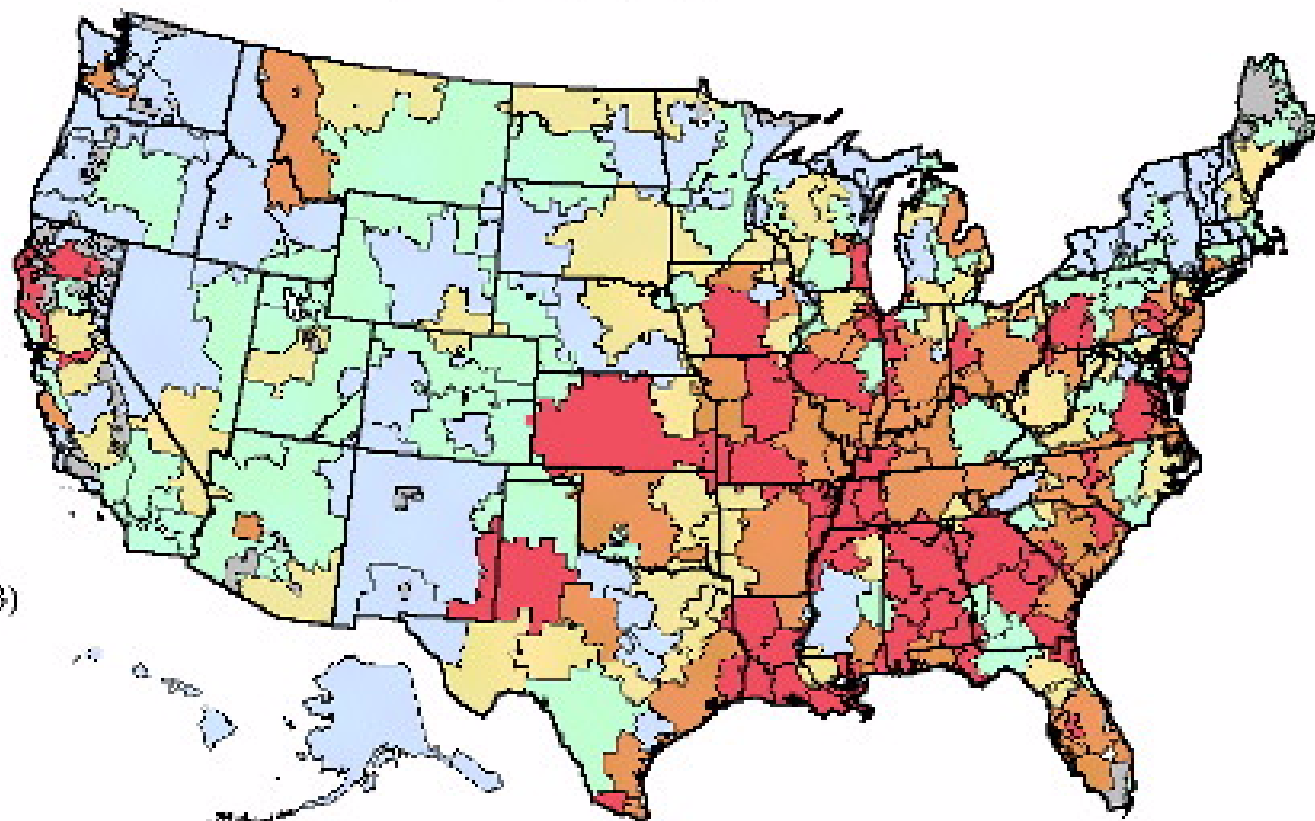
August 12, 2003

Overview

- Diagnosis: A Challenged Delivery System
- Where We Are: Costs and Benefits of HIT
- Clarification and Caveats
- Future Opportunities

VARIATIONS ARE WIDESPREAD

Coronary Angiography



Coronary Angiography Rate
per 1,000 Medicare Enrollees
by Hospital Referral Region (1992-93)

- 19.3 to 37.5 (61)
- 16.6 to < 19.3 (61)
- 14.9 to < 16.6 (61)
- 12.9 to < 14.9 (61)
- 7.9 to < 12.9 (62)



RAND Study: Quality of Health Care Often Not Optimal

Patients' care often deficient, study says.

Proper treatment given half the time.

On average, doctors provide appropriate health care only half the time, a landmark study of adults in 12 U.S. metropolitan areas suggests.

Medical Care Often Not Optimal

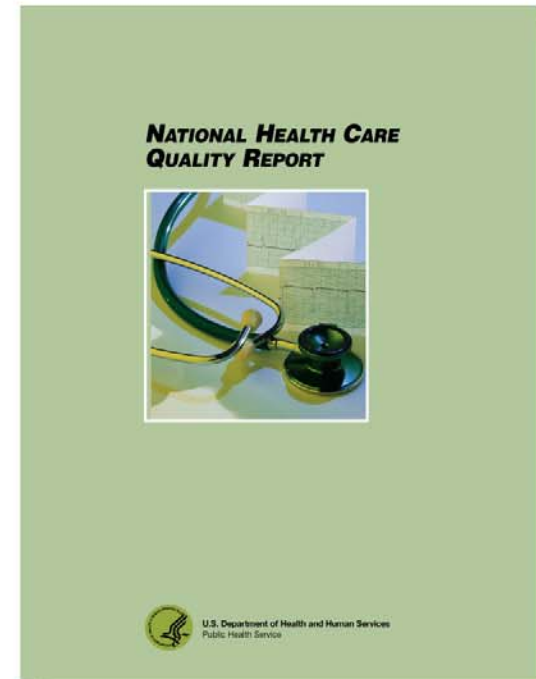
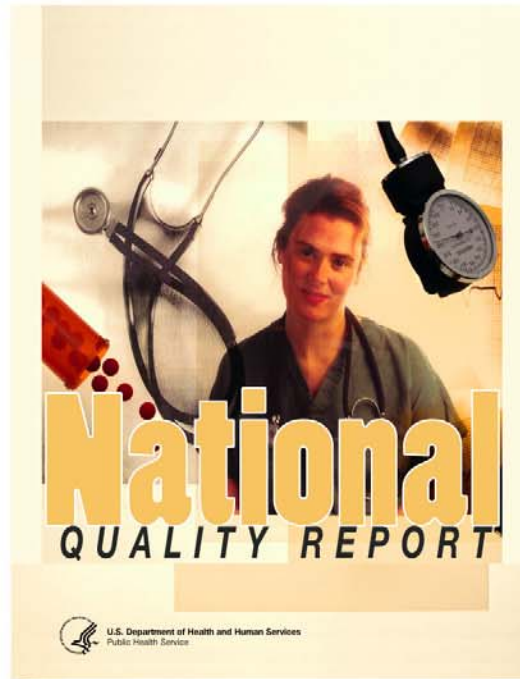
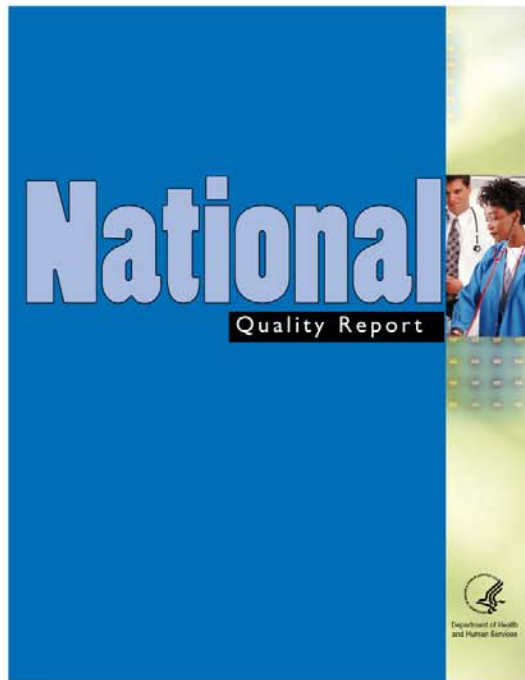
Failure to Treat Patients Fully Spans Range of What Is Expected of Physicians and Nurses

Study: U.S. Doctors are not following the guidelines for ordinary illnesses

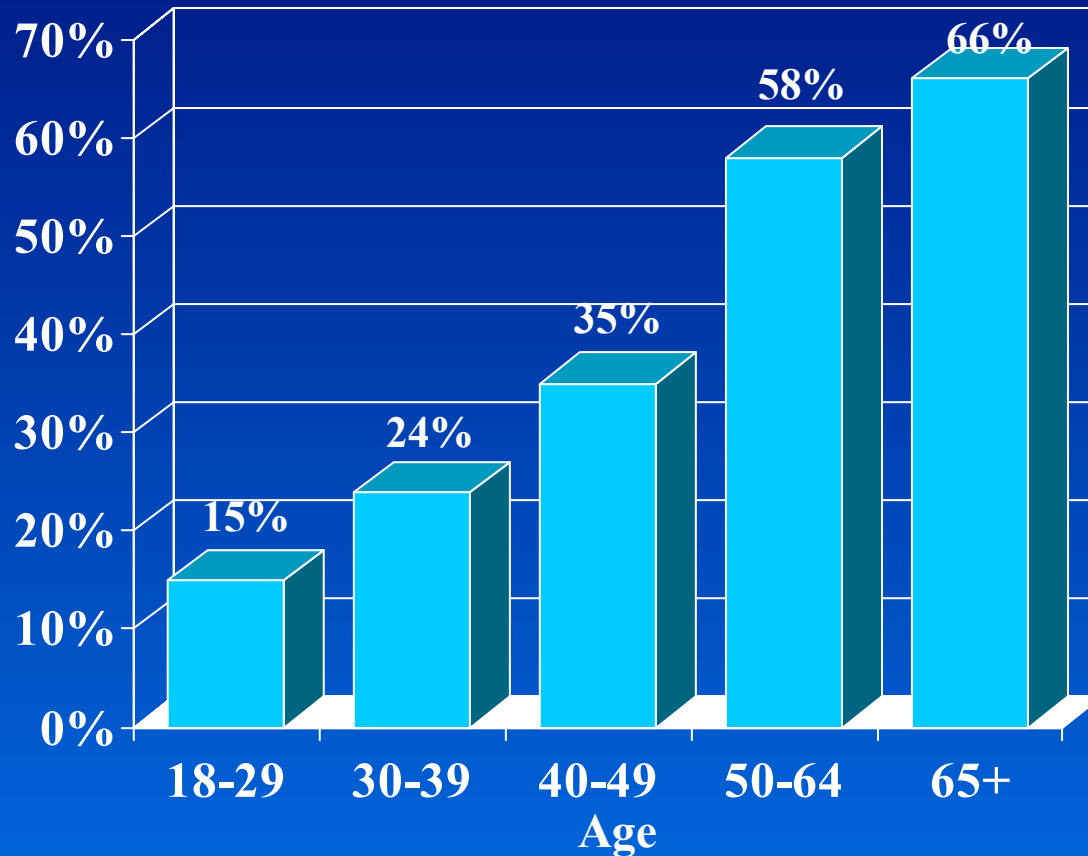
Medical errors corrode quality of healthcare system

The American healthcare system, often touted as a cutting-edge leader in the world, suddenly finds itself mired in serious questions about the ability of its hospitals and doctors to deliver quality care to millions.





Percent of Americans Saying “I Have A Chronic Condition”



Source: Chronic Illness and Caregiving Survey, Harris 2000



Health Technology Information

It's the Wave of the Future



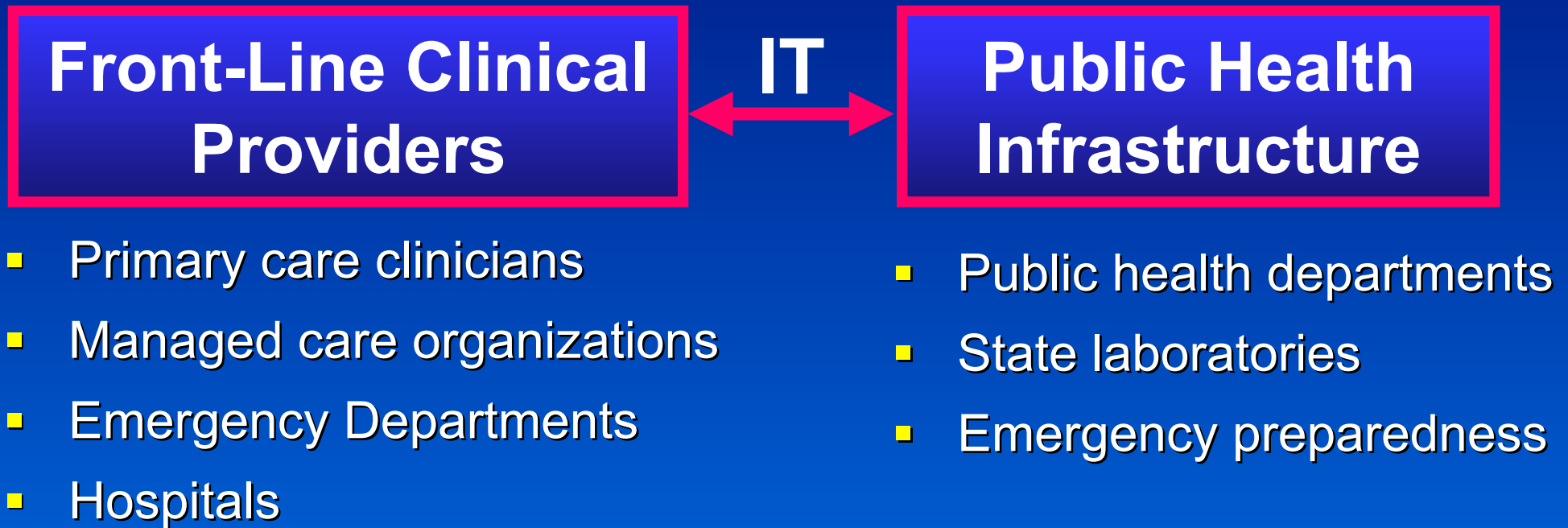
Potential of IT for Assessing Quality

- IT can enhance the precision and decrease the cost of measurement – i.e., getting to the “right” measures
- IT can also enhance translation of strategies to improve quality (e.g., decision support)
- IT can greatly enhance the timeliness of data collection

IT Can Improve Quality

- *Safety*: computerized physician order entry reduced adverse drug events by 55% (*Bates*)
- *Effectiveness*: reminder systems improve compliance with clinical guidelines and improve delivery of preventive services
- *Patient-Centered*: Internet can support clinical knowledge, online support groups, and improve health care outcomes (*Gustafson*)

Bioterrorism Preparedness: Improved Coordination Through IT



**“Potential is what you have when
you haven’t done it yet”**

Darrel Royall
University of Texas
Football coach



**“We have wonderful technology,
but some grocery stores have better
technology than our hospitals and clinics.”**

Secretary Tommy Thompson
Chicago Medical School Commencement
June 7, 2002



Overview

- Diagnosis: A Challenged Delivery System
- Where We Are: Costs and Benefits of HIT
- Clarification and Caveats
- Future Opportunities

Health Information Technology

-value across settings-

■ Inpatient Settings

- Computerized Physician Order Entry
- Clinical Decision Support Technologies
- Automated Medication Dispensing Systems
- Bar Coding Technologies

■ Ambulatory Settings

- E-Prescribing
- Clinical Decision Support Technologies
- Ambulatory Computerized Physician Order Entry
- Electronic Medical Records in Primary Care Settings

Computerized Computer Order Entry

- Physicians submit orders for medications and lab tests using online systems
- Significant impact on patient safety and quality:
 - Brigham & Women's Hospital and Massachusetts General Hospital (Bates et al):
 - 55% reduction in patient injuries secondary to adverse drug events (ADE's)
 - Rate of potential ADE's decreased by 84%
 - Increased adherence with clinical guidelines
 - Decreased variance in drug dosing.

Computerized Physician Order Entry: Impact on Cost

17% reduction in preventable adverse drug events =
annual savings of \$480,000 (Brigham & Women's)

- If ADE's reduced by 17% nationally
 - ◆ 656,800 preventable ADE's avoided each year
 - ◆ Save \$654 million annually

Implementation of CPOE systems demonstrate per
hospital savings of between \$5-10 million/yr

- Extrapolated to all U.S. hospitals = savings of
between \$7 and \$14 billion



Clinical Decision Support Technologies

- Assist clinicians in making critical decisions at the point and time of care.
- Effective in both inpatient and outpatient settings
- LDS Hospital, Salt Lake City:
 - Assists clinicians in choosing appropriate antibiotic for ICU patients
 - Utilizes patient specific information (e.g., laboratory data, temperature) and considers drug-drug interactions, drug allergies and relative costs.

Clinical Decision Support Technologies

- Results of the LDS System implementation
 - Impact on quality:
 - Reduced orders for drugs to which patients had reported allergy
 - Fewer orders with excess dosages
 - Fewer orders where wrong antibiotic was given
 - Impact on costs:
 - Reduced hospital stays (10d v 12.9)
 - Lower hospital costs (\$26,315 v \$35,283)
 - Lower costs of antibiotics (\$102 v \$340)

Clinical Decision Support Technologies

- Impact on Prevention:
 - Improved rates of vaccination (*3-fold higher*)
 - Improved rates of cancer screening:
 - Mammography (*2-fold higher*)
 - Colorectal cancer screening (*2-fold higher*)
 - Cardiovascular risk reduction (*2-fold higher*)

Automated Medication Dispensing Systems

- Automates many of the manual steps currently performed by nursing personnel
 - Stores and dispenses 24-hour supply of each patient's drugs to nurses on the floor
 - Connected to hospital pharmacy computer
 - New medication orders transferred automatically

Automated Medication Dispensing Systems

■ Impact on Quality

- Significantly **fewer** missed doses of drugs
- One study noted drop in medication error rate from 16.9% to 10.4%

■ Impact on Costs

- Studies indicate savings for individual hospitals of between \$1-2 million over five years
- Most savings attributable to decreased labor costs for pharmacy staff and nurses

Bar Coding Technologies

- Replace traditional data entry
- Allows for quick & accurate linkages:
 - Example: patient ID bracelet and medication dispensing unit
- Allows for faster entry of information with fewer errors

Bar Coding Technologies

■ Impact on Quality

- Study at a Veterans Hospital noted reduction in medication error rates after implementation:
 - Fewer errors caused by giving the wrong drug dosage (62% ↓)
 - Fewer errors caused by giving the wrong drug (75% ↓)
 - Fewer errors from giving the right medication at the wrong time (87% ↓)
 - Fewer errors from giving the wrong medication to the wrong patient (93% ↓)

Bar Coding Technologies

■ Impact on Cost

- Full implementation of FDA's proposed bar coding rule = 84,200 fewer hospital ADE's/hospital (23% reduction)
 - Annual net savings of \$190 million in treatment costs (\$29,000/hospital)
 - Annual societal benefit from avoiding ADE's of \$2.3 million per hospital
- Net annual benefit = \$2 million/hospital

E-Prescribing in Physician Practices

- Allows physicians to submit prescriptions to pharmacies electronically
- Eliminates issues of legibility and incomplete orders
- Allows for point-of-care ability to
 - Check drug-drug interactions
 - Confirm formulary compliance
 - Utilize decision support resources

E-Prescribing

■ Impact on Quality

- Reduction in medication errors
- Increased usage of generic drugs

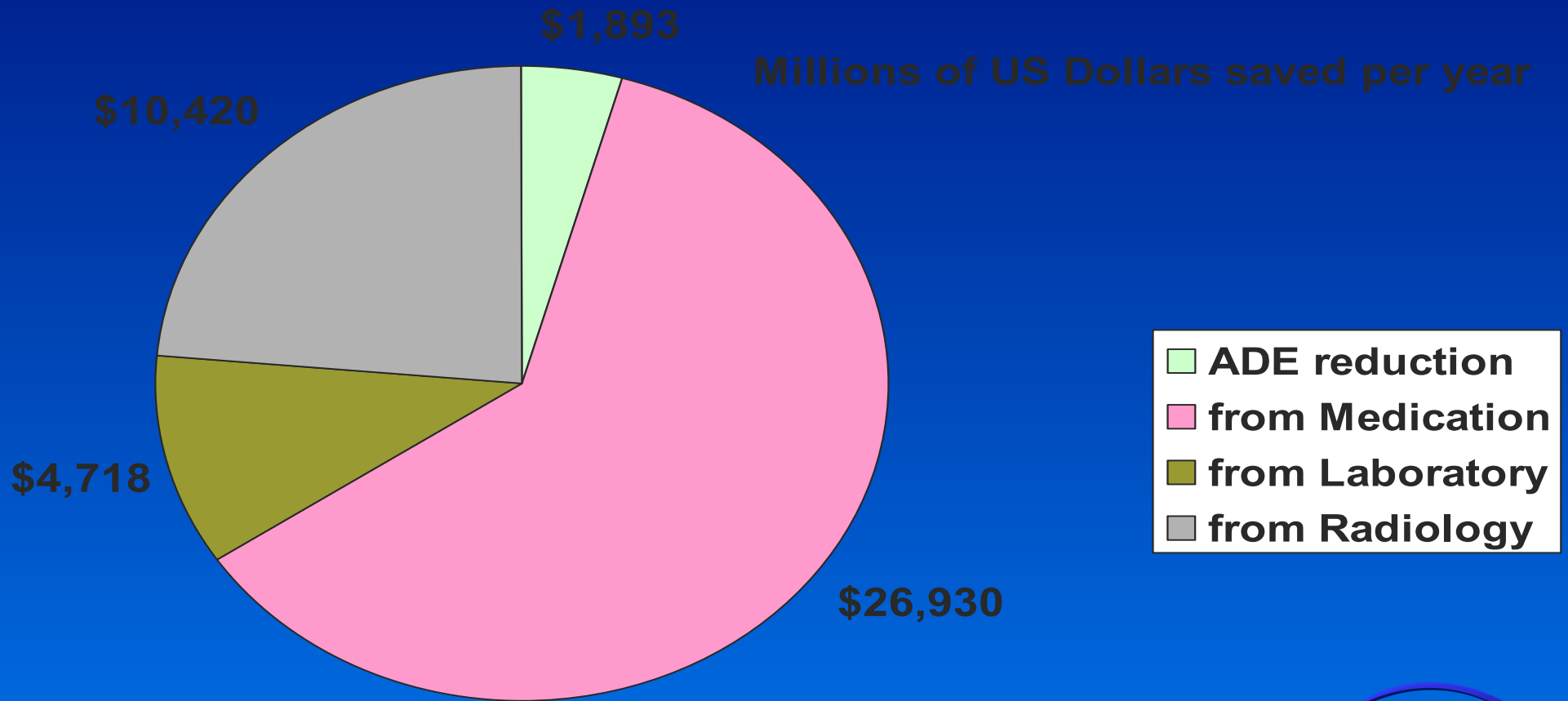
■ Impact on Cost

- Increased operational efficiency with quantifiable savings to practices (\$12,000/yr per Cap Gemini Ernst and Young)
- Reduction in pharmacy cost (\$1.15 PMPM)
- Reduced phone calls between providers and pharmacies (↓ 30%)

Ambulatory CPOE

- The Center for Information Technology Leadership estimates that implementing advanced ambulatory CPOE systems would:
 - Eliminate over 2 million ADEs/year
 - Avoid nearly 1.3 million physician visits, 190,000 admissions, and over 130,000 life-threatening adverse drug events/year.
- Nationwide adoption of advanced CPOE systems in the outpatient setting could save **\$44 billion/year** (60% medications, 24% radiology, 11% labs, and 5% ADEs).

National Cost Saving projections from Ambulatory CPOE: \$44 billion



Electronic Medical Records in Primary Care Settings

- Replaces paper medical charts
- Aggregates a patients complete medical record
 - Physician notes, lab tests, radiology results, immunization records.....all in one electronic place.
- Medical record is up to date, secure and available for providers in various care settings

Electronic Medical Records in Primary Care Settings

■ Impact on Quality and Cost

– Wang, et al noted the following

- 34% reduction in ADE's
- 15% reduction in drug utilization
- 9% reduction in lab utilization
- 14% reduction in radiology utilization
- Net savings of \$86,000/provider over five years

Overview

- Diagnosis: A Challenged Delivery System
- Where We Are: Costs and Benefits of HIT
- **Clarification and Caveats**
- Future Opportunities

If HIT is Such a Great Idea

- Generalizability of promising findings open to question
- Even successful hospitals use multiple vendors – and have internal interoperability challenges
- Implementation is “challenging”
- Physicians are independent contractors

Critical Challenges

- Common data elements and definitions; build capacity to make improvements
- Clear rules of the road: Who owns the data? Who decides what is in a record? Who can make changes? IRB's
- Transparency of purpose of data collection and use
- Making it easy

Overview

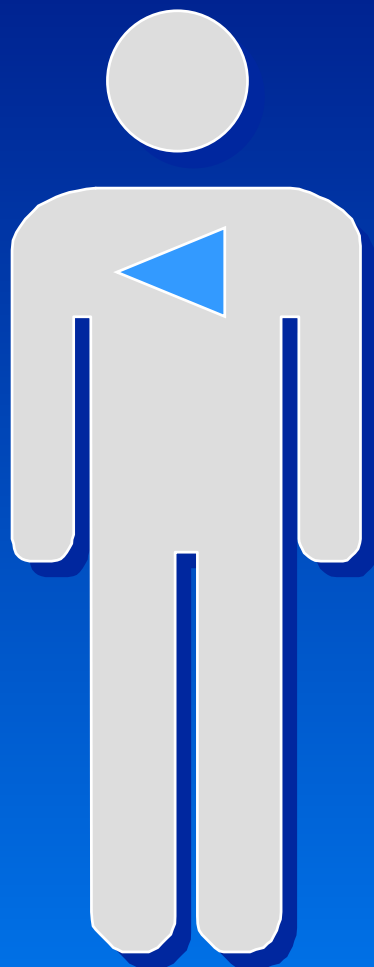
- Diagnosis: A Challenged Delivery System
- Where We Are: Costs and Benefits of HIT
- Clarification and Caveats
- **Future Opportunities**

Future Opportunities: ISO the “Tipping Point”

- AHRQ and ASPE co-sponsoring systematic, rigorous review of evidence on costs and benefits
- Role of nursing workforce?
- Consumer-controlled health care: Prepare NOW for consumers’ decisions about costs and benefits of medications

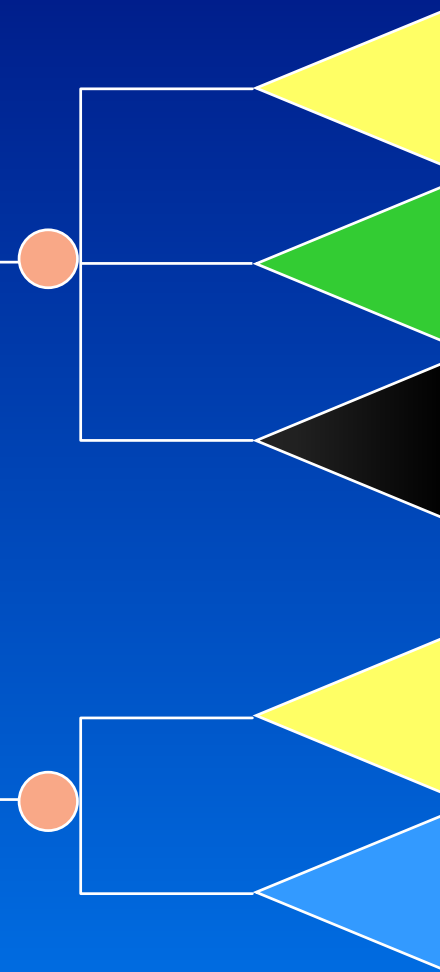
SHARED DECISION MAKING: DECISIONS AND OUTCOMES

Patient



Alternative 1

Alternative 2



**HEALTH
CARE:**

**Bring the Cost Down.
Keep the Quality Up.**

