Evidence-based Medicine and Disease Management: **Strategic Context, Emerging Implications**

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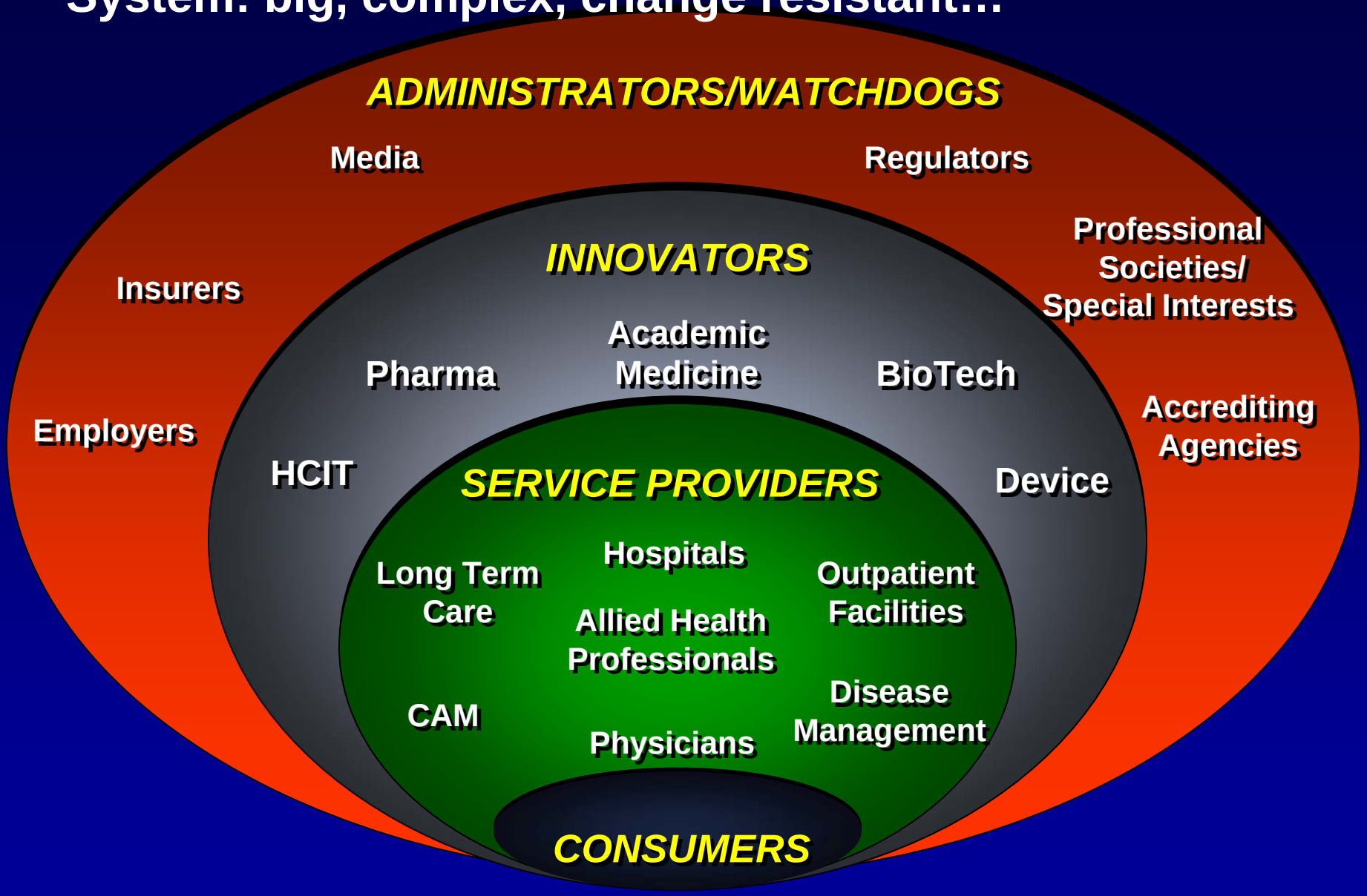
System: big, complex, change resistant…



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The system has achieved much…

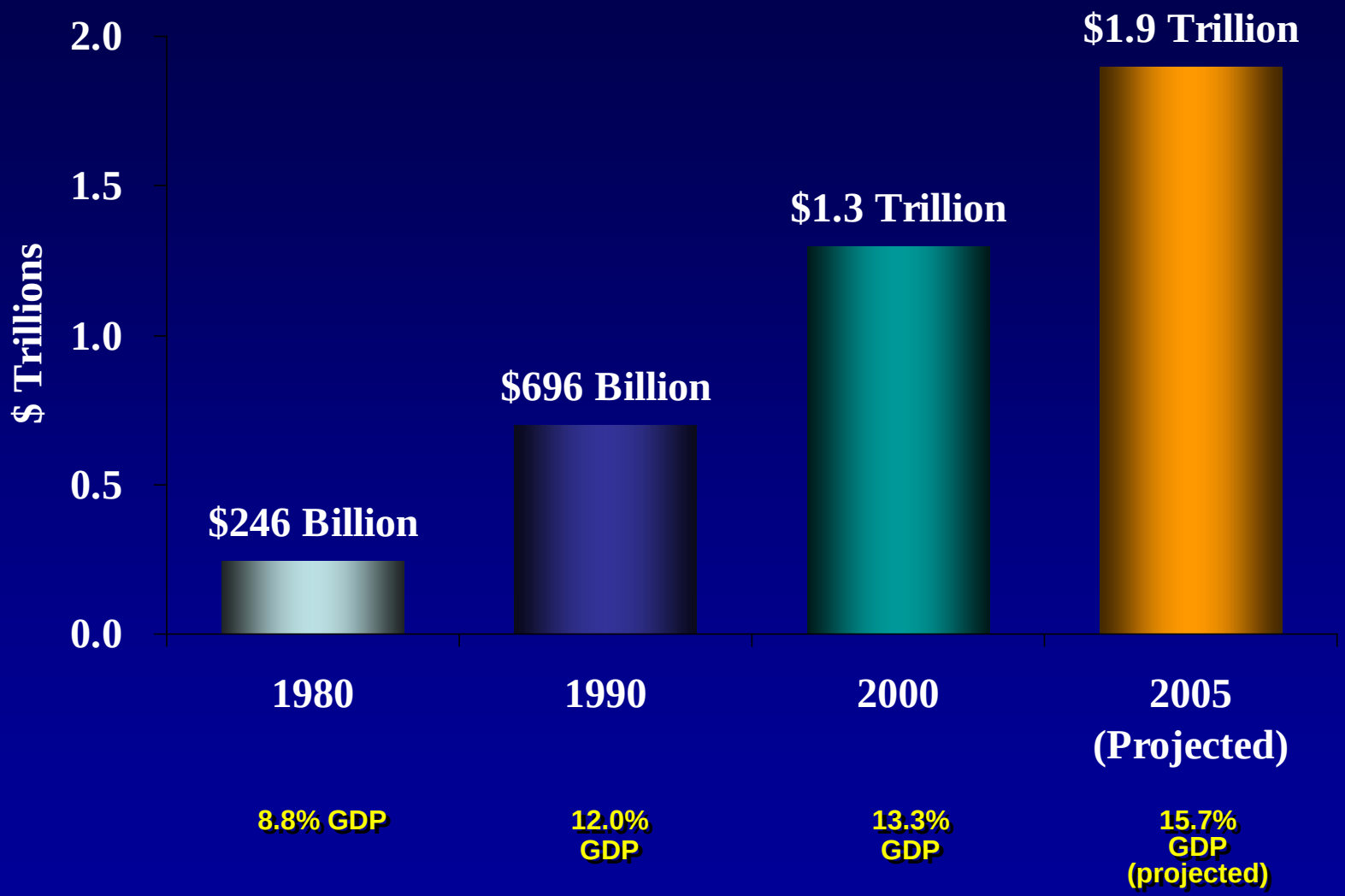
The Most Important Medical Developments of the Last Millennium

- Elucidation of Human Anatomy and Physiology
- Discovery of Cells and Their Substructures
- Elucidation of the Chemistry of Life
- Application of Statistics to Medicine
- Development of Anesthesia
- Discovery of the Relation of Microbes to Disease
- Discovery of the Immune System
- Development of Body Imaging
- Discovery of Antimicrobial Agents
- Development of Molecular Pharmacotherapy
- Sequencing of the Human Gene*
- Nanoscience tools for diagnostics and treatments*
- Biology of human behavior sequenced*
- Rational drug designs via proteomics, chemical biology, structural biology*

Results are impressive

- Virtual elimination of diphtheria, whooping cough, measles and polio
- Death rate from pneumonia reduced by 85%
- Over 90% reduction in deaths from tuberculosis
- Deaths from ulcers reduced by 60%
- In Hospital mortality form acute myocardial infraction reduced by 55% from 1975-1995 largely through the use of 3 drugs
- In industrialized nations there is a strong positive relationship between per capita pharmaceutical expenditure and life expectancy.
- In the 19 most prevalent diseases causing death, 73% of the reduction in life years lost before age 75 is due to new drug development.
- AIDS deaths in the U.S. reduced by over 50%

But it's costly: $7523 per person in the U.S.!



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Quality is suboptimal: "The quality of care we get is far from the care we should be getting" *—Don Berwick, IHI*

Preventive care deficiencies
- Child immunizations 76%
- Influenza vaccine 52%
- Pap smear 82%

Acute care deficiencies
- Antibiotic misuse 30-70%
- Prenatal care 74%

"Quality of Care"
Safe
Effective
Patient-centered
Timely
Efficient
Equitable

Surgery care deficiencies
- Inappropriate hysterectomy 16%
- Inappropriate CABG surgeries 14%

Chronic care deficiencies
- Beta blockers 50%
- Diabetes eye exam 53%

Hospital care deficiencies
- Proper CHF care 50%
- Preventable deaths 14%
- Preventable ADEs 1.8/100 admits
  - Life threatening 20%
  - Serious 43%

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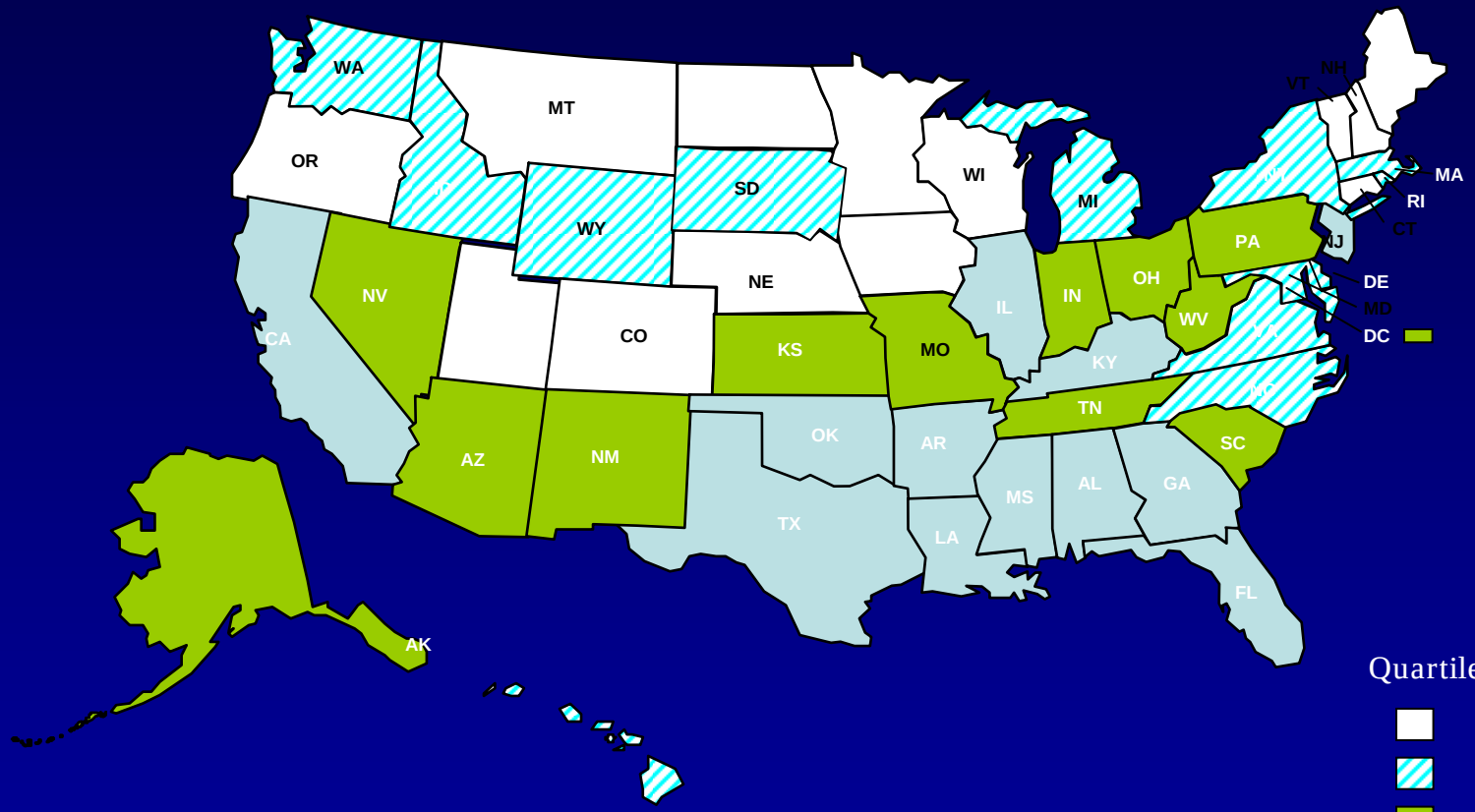
Quality varies depending on where you live



Quartile Rank

- First
- Second
- Third
- Fourth

Note: State ranking based on 22 Medicare performance measures.

Source: S.F. Jencks, E.D. Huff, and T. Cuerdon, "Change in the Quality of Care Delivered to Medicare Beneficiaries, 1998–1999 to 2000–2001," *Journal of the American Medical Association* 289, no. 3 (Jan. 15, 2003): 305–312.

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Why does “care” vary by where people live? Two possible answers..

- People have different medical needs and expectations
  - Epidemiology and population health
  - Patient preferences (preference sensitive care)
- Physicians practice differently
  - Practice patterns vary
  - Composition of medical community vary (supply sensitive care)

Example: Variation in Chronic Care

During Last Six Months of Life

	U.S. Average	*Lowest*	*Highest*
Days Spent in Hospital	11.7	7.3 (UT)	16.4 (NY)
Days in ICU	3.2	1.5 (ND)	4.7 (FL)
Physician Visits	29.0	17.0 (UT)	35.5 (NY)
% Seeing 10 or More Physicians	27.5%	13.3% (ID)	35.6% (NY)
% Deaths Associated with Admission to ICU	18.5%	11.7% (SD)	25.1% (NJ)
% Deaths enrolled in Hospice	27.2%	6.7% (AK)	39.3% (CO)
Medicare Expenditures (A,B) in Last Two Years	$29,199	$23,855 (ND)	$39,637 (DC)

Example: Geographic Variation In The Appropriate Use Of Cesarean Delivery

There is enormous geographic variation in the use of cesarean delivery: For births over 2,500 grams, adjusted cesarean rates vary fourfold between low and high-use areas.

Even for births under 2,500 grams, high-use counties have rates that are double those of low-use ones. Higher cesarean rates are only partially explained by patient characteristics but are greatly influenced by non-medical factors such as provider density, the capacity of the local health care system,

and malpractice pressure. Areas with higher usage rates perform the intervention in medically less appropriate populations--that is, relatively healthier births--and do not see improvements in maternal or neonatal mortality.

- *Health Affairs* 25 (2006): w355-w367; 10.1377/hlthaff.25.w355]

Examples of Inappropriate Variation Readily Available

Misuse

- 22% of patients take less medication than prescribed
- Antibiotic use for acute otitis media in children
- Bed rest instead of routine activity for back pain
- Cox2 inhibitors over older NSAIDS/ibuprofen (vioxx, celebrex 8-16 x more harmful)
- 16% of hysterectomies not necessary
- 14% of CABG procedures not necessary
- 7% of hospital patients experience serious medication error
- Antibiotic use for upper respiratory infections (physicians say it increases patient satisfaction)

Under Use

- Only 45% of diabetic patients receive appropriate care
- Only 53% of diabetics have retinal exam
- Only 50% of heart attack patients receive beta blockers
- Only 82% of women of pap smear
- Only 76% of children have immunizations
- Only 50% of elderly receive pneumoccal vaccine

Overuse

- No correlation between # of prenatal visits and outcome (birth)
- Urinalysis and culture for UTI in symptomatic women
- Tests for asymptomatic patients routinely done for which there is not evidence of efficacy:
  - Chest X Ray for elderly, smokers
  - Hemoglobin for anemia
  - ESR for infammatory infective disease
  - Liver function tests in blood
  - Renal function tests
  - Calcium in blood
  - Uric acid in blood
  - PSA in men 50+
  - Glucose in blood
  - HDL/LDL ratio
  - Mammographs for women 40+
  - Ultrasound exam: ovaries
  - Bone densitometry in women
  - Resting ECG
  - Exercise ECG on treadmill
  - Ultrasound exam of aorta: males 55+
- 30% of children get excessive antibiotics for ear infections
- 20-50% of surgeries not necessary (IHI)
- 50% x-ray for low back pain not needed

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Why so much variation?
Adherence to evidence varies widely

McGlynn et al "The Quality of Health Care Delivered to Adults in the United States" NEJM June 26, 2003

Condition	% Recommended Care Received
Senile Cataract	78.7
Breast cancer	75.7
Prenatal Care	73.0
Low back pain	68.5
Coronary artery disease	68.0
Hypertension	64.7
Congestive heart failure	63.9
Cerebrovascular disease	59.1
Chronic obstructive pulmonary disease	58.0
Depression	57.7
Orthopedic conditions	57.2
Osteoarthritis	57.3
Colorectal cancer	53.9

Condition	% Recommended Care Received
Asthma	53.5
Benign prostatic hyperplasia	53.0
Hyperlipidemia	48.6
Diabetes mellitus	45.4
Headache	45.2
Urinary tract infection	40.7
Community acquired pneumonia	39.0
Sexually transmitted diseases	36.7
Dyspepsia/peptic ulcer disease	32.7
Atrial fibrillation	24.7
Hip fracture	22.7
Alcohol dependence	10.5

Our challenges are many…

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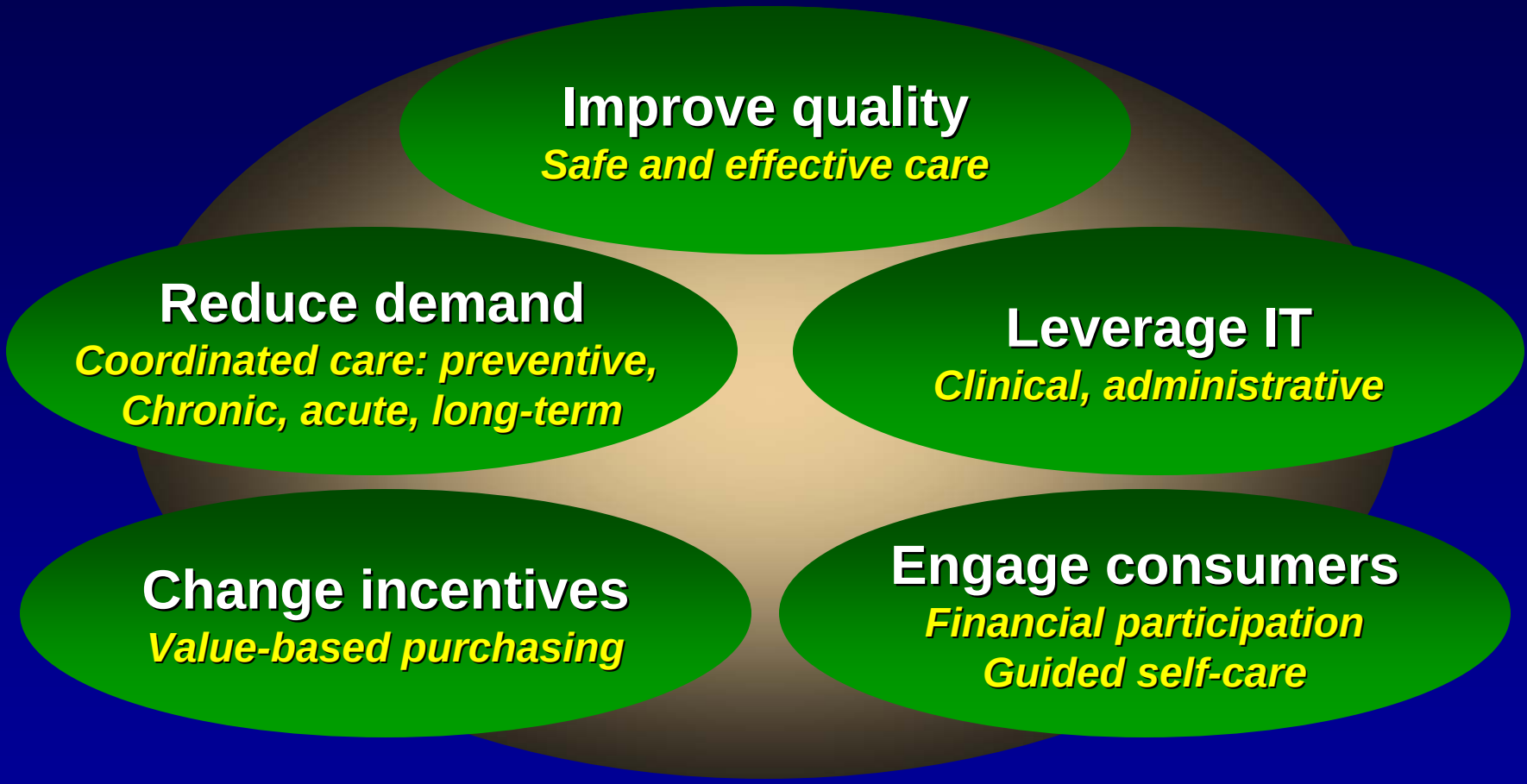
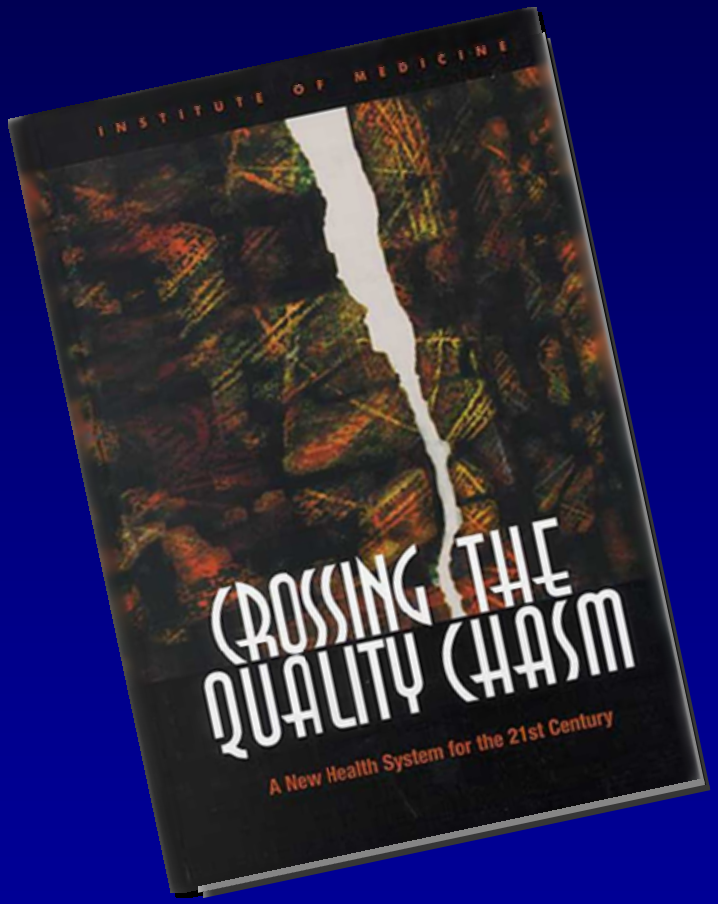
Solution: Health System Transformation



Safe and effective care will be the foundation for transformation…



- Evidence Based Care
- Patient Centered Approach
- System Orientation

It is the neutral ground upon which public policies and private initiatives are framed

Safe and effective care is primarily about error avoidance and adherence to evidence-based practices

Service Delivery Processes

- Satisfaction with care management processes
- Amenities to reduce anxiety, increase comfort

Structural Processes

- Access to needed services in appropriate settings
- Paperwork/administrative procedures to access services and document transactions

Clinical Processes

- Adherence to evidence-based pathways in the diagnosis and intervention planning with patients
- Safe, effective, timely, patient-centered care
- Collaborative care management

Supportive

Primary

Clinical Excellence!

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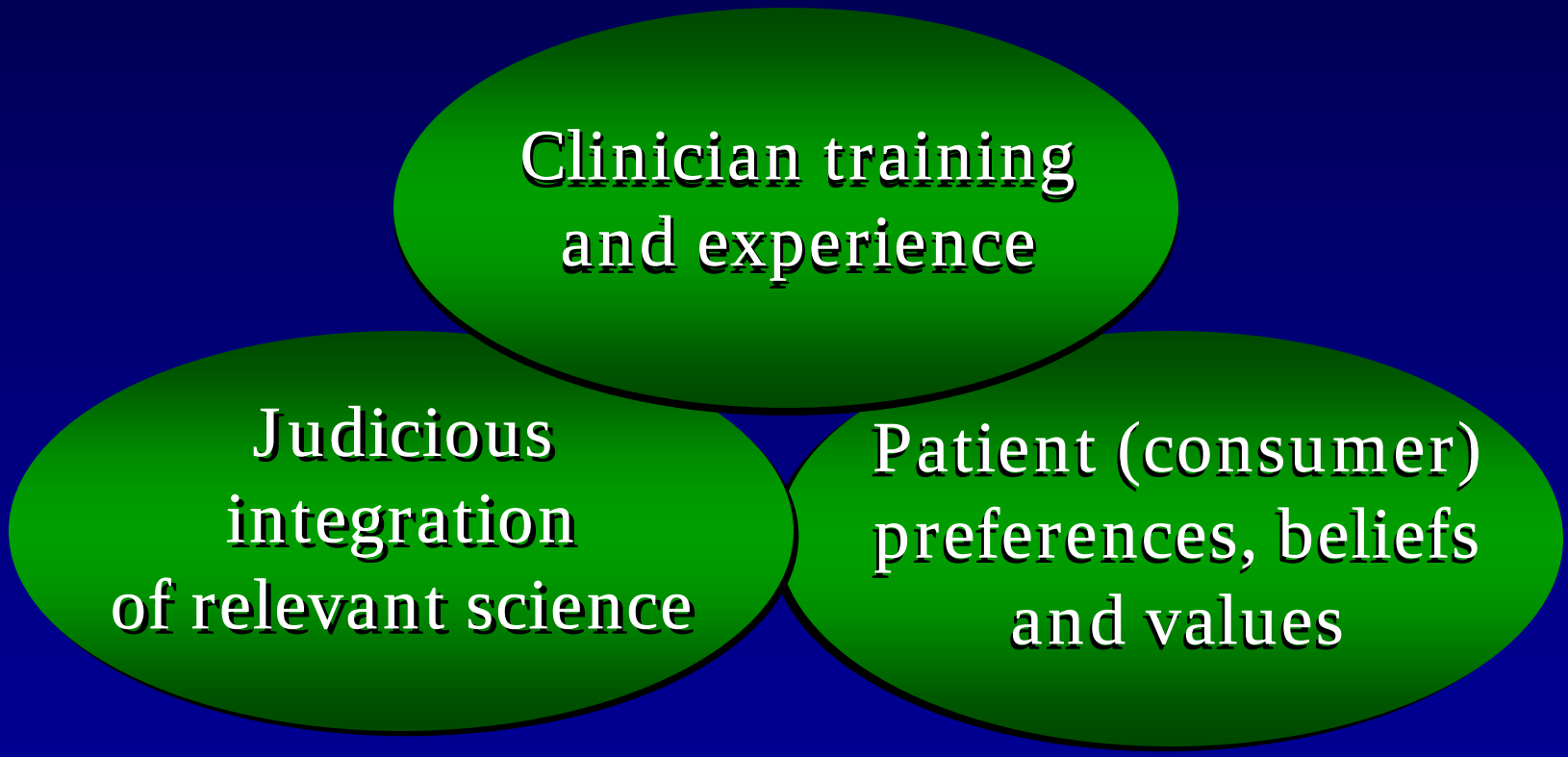
Effective care is based on evidence-based medicine



"Evidence-based medicine is the judicious application of relevant scientific studies to patient preferences and values."

Strategic Perspective: EBM in Coordinated Care

- Relatively strong evidence for drug and lifestyle interventions for the major patient populations
- Emerging evidence for interventions involving self-care, devices, and adherence (but much left to be studied)
- Fairly strong consensus from evidence about diagnostic indicators (but more discreet tools needed for co-morbidities, risk factors, and values-based treatment plans)
- New conditions and opportunities for expanded application of the coordinated care model

Most consumers think they are getting evidence-based care NOW!

73% of patients depend on physicians to make decisions for them!

17.1% Strongly Agree | **45% Agree** | **11%** | **22.5% Disagree** | **4.8% Strongly disagree**

***Adapted from Guyatt et al. Incorporating Patient Values in: Guyatt et al. Users' Guide to the Medical Literature: Essentials of Evidence –based Clinical Practice. JAMA 2001**
****Arora NK and McHorney CA. Med Care. 2000; 38:335**

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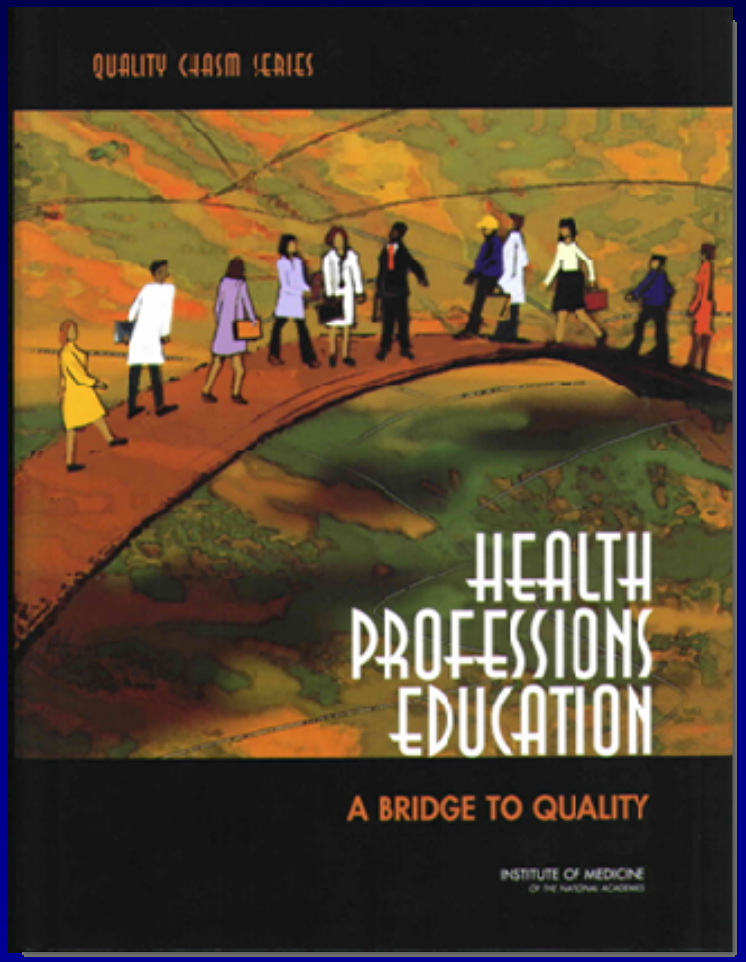
And most physicians are being alerted to the gaps..

- Provide patient centered care
- Work in interdisciplinary teams
- Employ evidence-based practice
- Apply quality improvement
- Utilize informatics

Health Professions Education: A Bridge to Quality
Institute of Medicine 2003

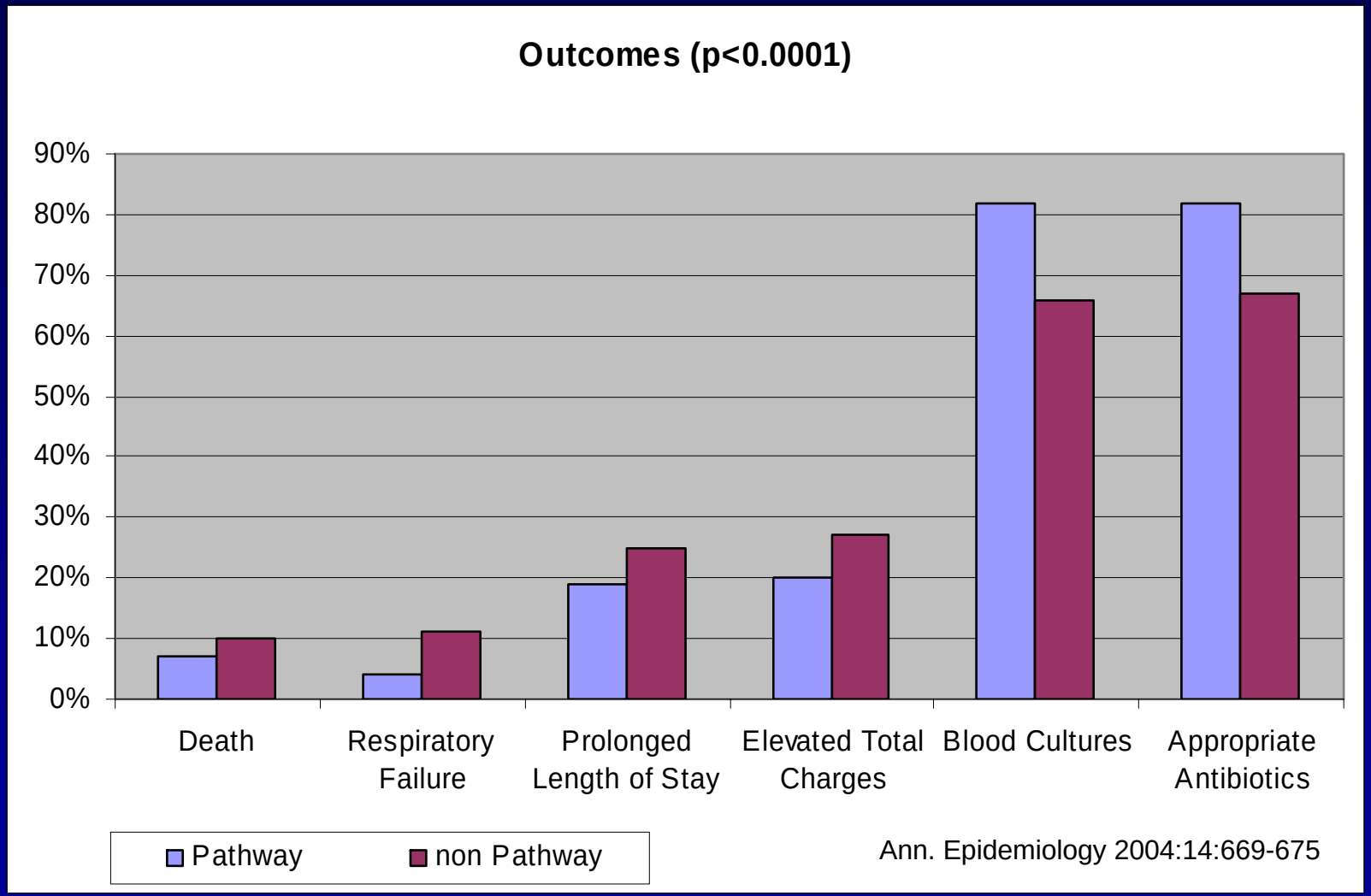


Lots of explanations …

- "they don't pay for it.."
- "the tools aren't available"
- "my patients don't care"
- "it's a fad"
- "the only evidence I need is what I know"

Is it going away?

The correlation between adherence and outcomes is strong



Payers are noticing: adherence is a key metrics for acute & chronic populations

Program Name	*Sponsor*	*Date Begun*	*Clinical Condition Focus*	*Bonus Target Payment*
Reporting Hospital Quality Data for Annual Payment Update	CMS	FY 2005	Acute Myocardial Infarction, Heart Failure, Pneumonia	-0.4 % of Medicare Payments for Hospitals not reporting
The Premier Hospital Quality Incentive Demonstration	CMS	October 2003	Acute Myocardial Infarction, Heart Failure, Pneumonia, CABG, Hip + Knee Replacement	Top Decile - 2% bonus of DRG Payments by Condition, Second Decile - 1% bonus
Bridges to Excellence	NCQA	Diabetes Care Link began in 1997	Diabetes Care, Cardiac Care	$80 per diabetes patient, $160 per cardiac patient, payed to physicians
Leapfrog Hospital Rewards Program	Leapfrog Group	April 2005	Acute Myocardial Infarction, CABG, PCI, Pneumonia, Deliveries	Bonuses every six months based on market and performance group activity

The model of coordinated care will expand to acute, long-term care settings

Results from CMS Hospital Compare April 2005 (4203 hospitals reporting)

# Reporting	*Heart Attack* (2008)	*Heart Failure* (2963)	*Pneumonia* (3393)
# indicators	**6**	**4**	**5**
Top 20% Score Median Bottom 20%	**96%** **92%** **85%**	**87%** **76%** **64%**	**84%** **76%** **69%**
Higher performers	▪Major teaching ▪Tax Exempt ▪Public* ▪Urban	▪Major teaching ▪Urban ▪Tax Exempt	▪Rural ▪Public ▪Non-teaching
Lower performers	▪Rural ▪Investor-owned ▪Non-teaching ▪Public*	▪Rural ▪Investor-owned ▪Public ▪Non-teaching	▪Major teaching ▪Investor-owned ▪Urban

Looking ahead: EBM in Coordinated Care

- Increased opportunities in new populations & settings
- Increased attention to coordination between coaches, clinicians and consumers
- Increased integration of holistic interventions with conventional
- Increased pressure to show long-term behavior change
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- Increased scrutiny of business model and results
- Increased influence of government at state and federal levels to improve performance

Contact

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