The Future of Anesthesiology

Propelled by Technology,
STA please rescue me

Kenneth Y. Pauker, M.D.

Society for Technology in Anesthesia
2014 Annual Meeting
Rosen Hotel
Orlando, FLA

Thursday, January 16, 2014

Rescue Me by Buckcherry

I cherish the love and I cherish the life that's inside of me
I know I'm not a sight to see
But baby I'm alive
Won't you come and rescue me
Separate myself from me
Maybe I'm too blind to see
Save my life
Won't you come and rescue me
I'm torn away from what I need
Help me now I'm way too deep
Save my life
Rescue me

http://www.youtube.com/watch?v=YugNWEVckWY

Time of video 2:32-3:12

No Conflicts of Interest to Disclose

Kenneth Y. Pauker, M.D.

California Society of Anesthesiologists

Past-President
Associate Editor, CSA Bulletin
Former Chair, Division of Legislative and Practice Affairs

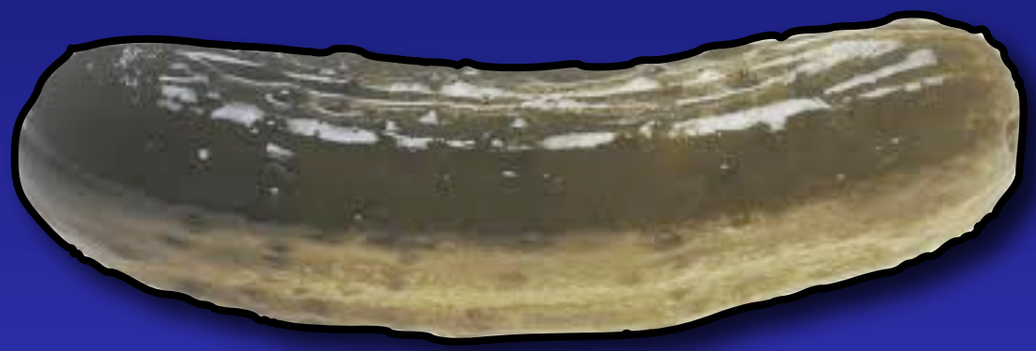
American Society of Anesthesiologists

House of Delegates
Committee on Performance and Outcomes Measurement
Committee on Communications
Committee on Credentials
Formerly, Committee on Governmental Affairs and
Committee on Anesthesiologist Assistant Education and Practice

University of California, Irvine, School of Medicine

Assistant Clinical Professor (Volunteer)
Department of Anesthesiology and Perioperative Care

The Pickle



What is the basis for the anticipated radical changes in American Medicine?

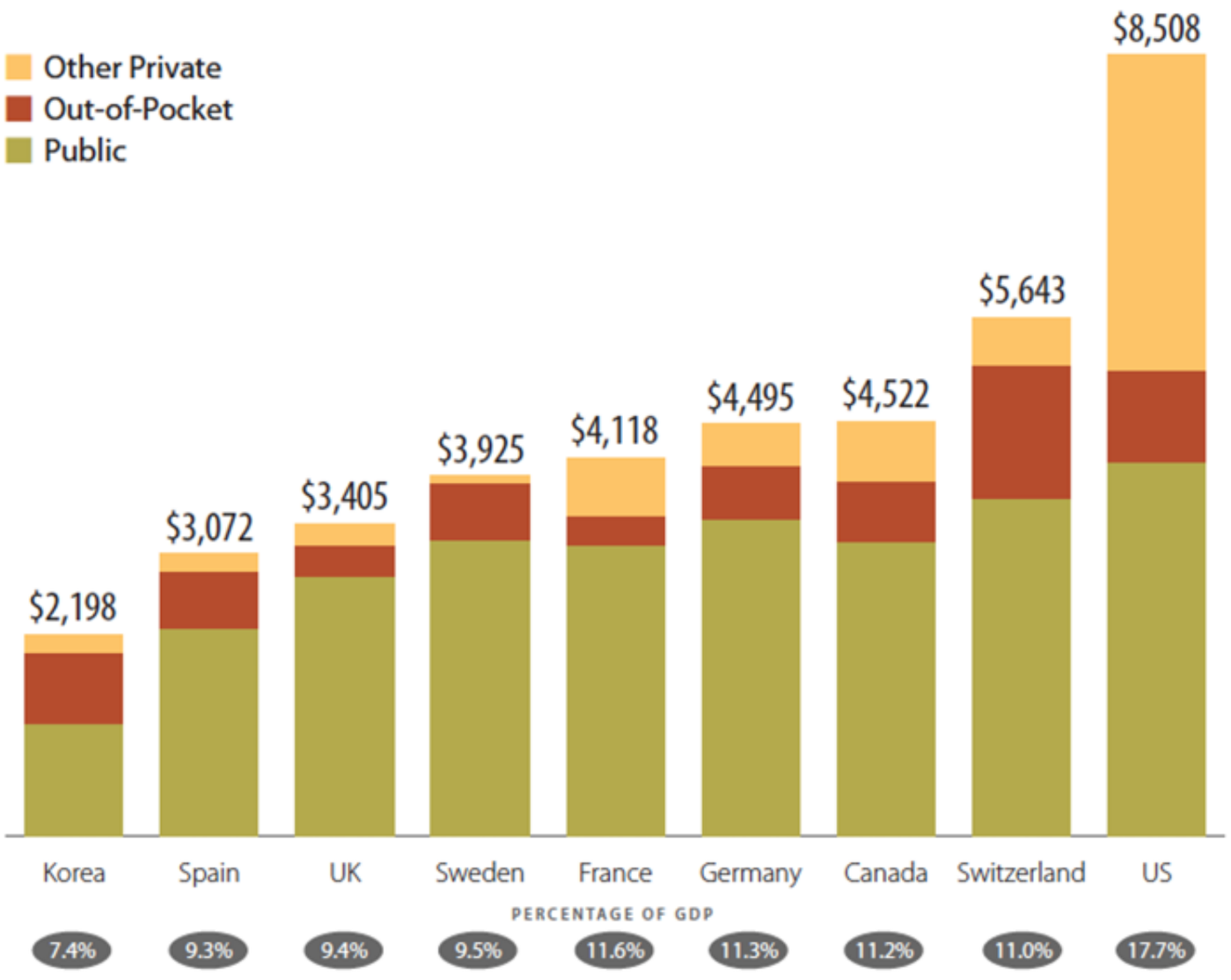
Demographics — aging boomers

Healthcare costs:

- Share of economy — 7.2% (1970) to 17.9% (2010)
- US is #1 % GDP (2009, 2010, 2011) — 17.9%
- US is #1 per capita (2011) — $8,680
- #2 per capita is Norway — $5,352 (9.6% GDP, #16)
- #2 % GDP is Netherlands — 12% ($4,914, #4)
- Europe generally 11-12% GDP

Health Spending Per Capita and as a Share of GDP

Selected Developed Countries, 2011



Note: US spending per capita as reported by OECD differs from figures reported elsewhere in this report.

Source: Organization for Economic Cooperation and Development, *OECD Health Data 2013*, June 2013, www.oecd.org.

Health Care Costs 101
Spending Levels

US health spending far exceeds that of other developed countries, both in per capita spending and as a percent of GDP. Unlike the United States, in most developed countries the public sector dominates health spending.

Healthcare Costs 101
CHCF
September 2013

PAYER DEFINITIONS

Other private is computed as total spending less public spending and out-of-pocket spending.

Out-of-pocket includes consumer spending on copays, deductibles, and goods and care not covered by insurance; it does not include premiums.

Federal Share of Payments

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Federal, state, and local government payments for US healthcare

- 45% of total $2.7 trillion (2011)

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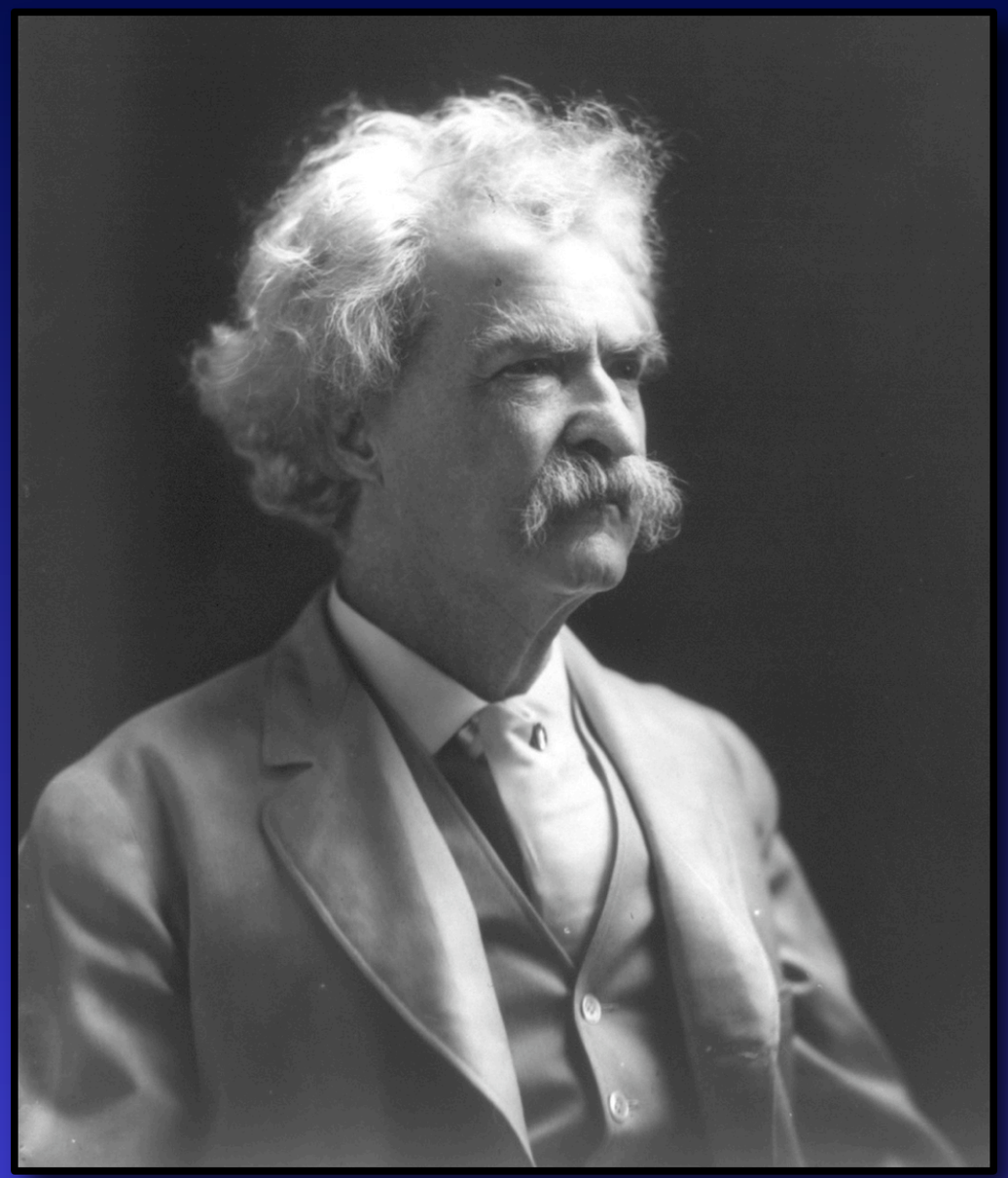
Federal share

- 28% of total payments (cf. 23% in 2007)
- 46% of federal revenue
- 6% of household income



"Get your facts first, and then you can distort them as much as you please."

Under the Hood of Socio-Politico-Economic Influences

- Supply produces demand with incentives to do more
- Inertia to render non-beneficial care
- Hidden medical liability influences
- Technology as a major driver

Under the Hood of Socio-Politico-Economic Influences

"Technology as a 'major driver' of health care costs: a cointegration analysis of the Newhouse conjecture"

Okunade AA and Vasudeva NRM. *Journal of Health Economics*: 21(1), January 2002, Pages 147–159.

Abstract

Per capita real income on the demand-side and technological change, proxied by total R&D and health R&D spending, on the supply-side are hypothesized as major drivers of per capita real health care expenditure in the US during the 1960–1997 period. The findings are robust to a battery of unit root and cointegration tests. They support the Newhouse [Journal of Economic Perspectives 6 (1992) 3] conjecture that technological change is a major escalator of health care expenditure and confirm a significant and stable long-run relationship among per capita real health care expenditure, per capita real income and broad-based R&D expenditures. Policy implications are noted.

Robert Wood Johnson Foundation

THE SYNTHESIS PROJECT

NEW INSIGHTS FROM RESEARCH RESULTS

ISSN 2155-3718

RESEARCH SYNTHESIS REPORT NO. 16
OCTOBER 2008

Paul B. Ginsburg, Ph.D.,
President, Center for Studying Health System Change

High and rising health care costs: Demystifying U.S. health care spending

Findings

Table 1. Estimated Contributions of Selected Factors to Growth in Real Health Care Spending Per Capita, 1940–1990

	Studies Estimating Contributions of Selected Drivers		
Drivers of Cost Trend	**Smith, Heffler and Freeland (2000)**	**Cutler (1995)**	**Newhouse (1992)**
Aging of the Population	2%	2%	2%[a]
Changes in Third-Party Payment	10	13	10[b]
Personal Income Growth	11–18	5	<23
Prices in the Health Care Sector	11–22	19	*
Administrative Costs	3–10	13	*
Defensive Medicine and Supplier-Induced Demand	0	*	0
Technology-Related Changes in Medical Practice	38–62	49	>65

Notes: Amounts in the table represent the estimated percentage share of long-term growth that each factor accounts for.

* = not estimated.

[a] Represents data for 1950–1987

[b] Represents data for 1950–1980.

Source: Congressional Budget Office, 2008 (17) based on Smith (79), Cutler (19) and Newhouse (59)

Technology. Measuring the contribution of changing medical technology is particularly challenging because of the inability to measure aggregate technological change directly. Nevertheless, all of the studies reviewed obtain broadly similar results. Most studies measure technology as a residual; that is, after estimating the contributions of all of the directly measurable drivers of spending, attributing the proportion of spending increases not otherwise explained as the contribution of technology. These approaches are vulnerable to confounding technological change with other factors for which the contribution is not fully captured (or measurement errors). For example, the role of increasing rates of obesity has not been studied until recently, so some of its

Under the Hood of Socio-Politico-Economic Influences

Bending the cost curve

Institute of Medicine (IOM) Report (2000) results in demand for safety and cost-effectiveness:

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Bending the cost curve

Institute of Medicine (IOM) Report (2000) results in demand for safety and cost-effectiveness:

- The promulgation of Pay for Performance (P4P)
- The advent of the new science of performance measurement
- Now Value Based Purchasing (VBP) and Accountable Care Organizations (ACOs)

What is constant in Medicine?

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- The evolution of the Art and Science of Medicine

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- The altruistic idealism of newly minted MDs

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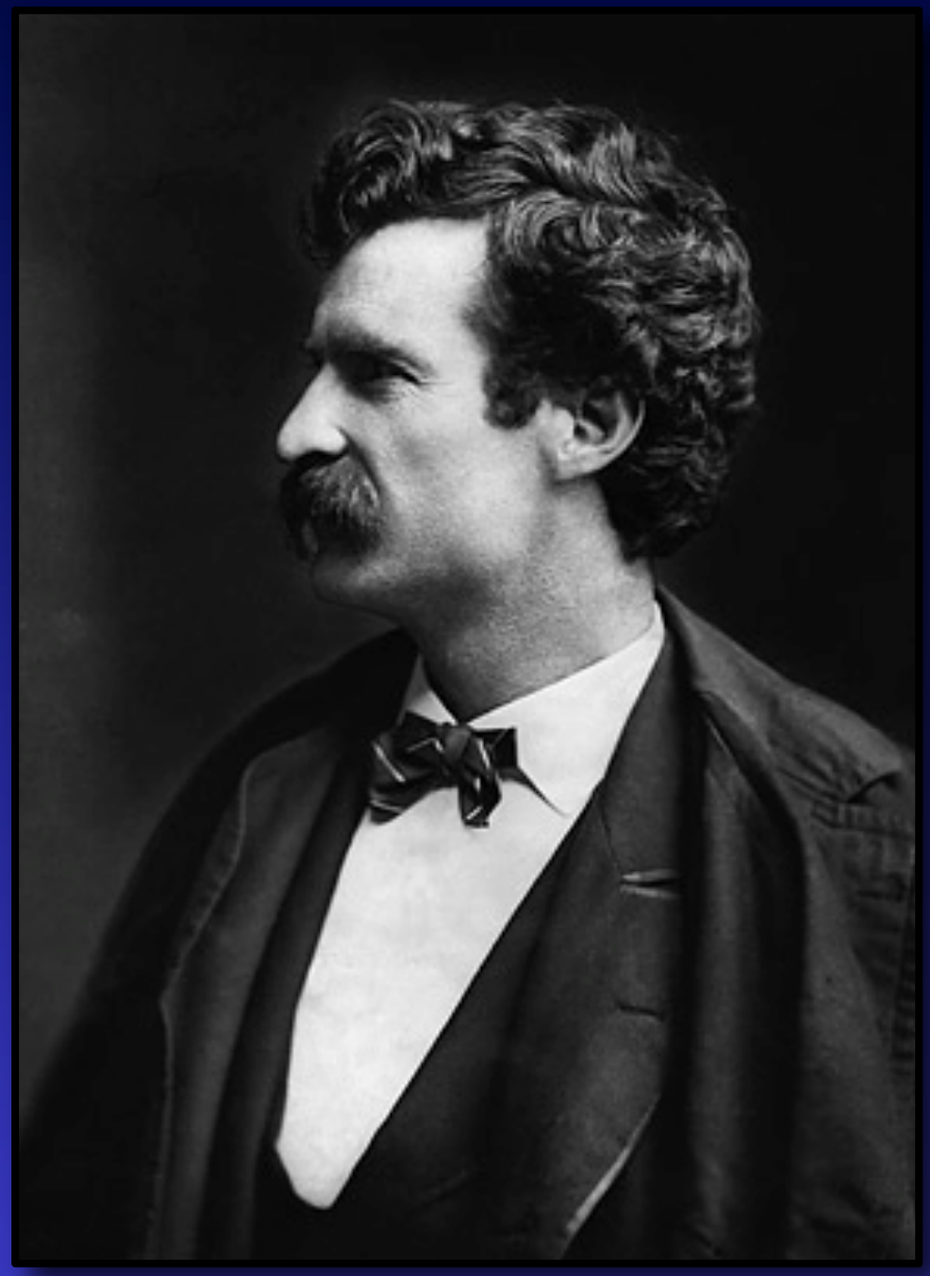
- The evolution of the Art and Science of Medicine
- The altruistic idealism of newly minted MDs
- The imperatives for individual professionalism
- The necessity for engagement with professional organizations like the STA and the ASA
- Medical politics – local, state, and national



“There is no distinctly native American criminal class except Congress.”

What is constant in Anesthesiology?

What is constant in Anesthesiology?

Our commitment

- to the critically ill and those with acute/chronic pain
- to improve patient care and safety

What is constant in Anesthesiology?

What is constant in Anesthesiology?

The tension between

- what is comfortable v. what is unknown
- minimizing risk v. pushing forward for ?reward
- academic v. community perspectives

"It's all about the patient, because we have no other reason to exist."

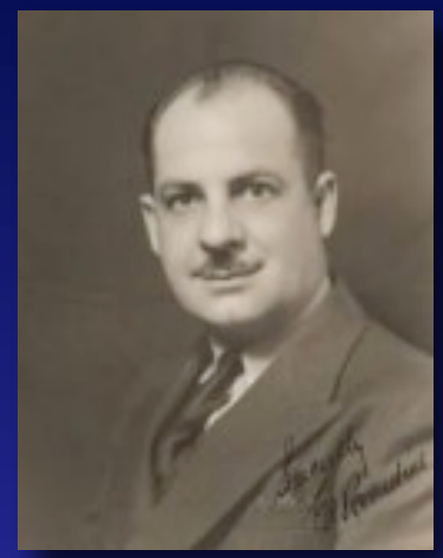
Roger Litwiller, MD
ASA President, 2003-2004

The Future

The Future

Is it here today?

Who was Emery A. Rovenstine?



1895-1960

1935 — Chair of Anesthesiology, Bellevue Hospital
1937 — 2nd American Professor of Anesthesiology, NYU School of Medicine
1943-1944 — President, American Society of Anesthetists (precursor of ASA)
1948 — a founder of ASA
1957 — ASA Distinguished Service Award
1962 — Inaugural Emery A. Rovenstine Memorial Lecture at ASA Annual Meeting

How to synthesize this into predictions?

- David E. Longnecker, 1996 Rovenstine

Navigation in Uncharted Waters: Is Anesthesiology on Course for the 21st Century?

- Mark A. Warner, 2005 Rovenstine

Who Better than Anesthesiologists?

- Ronald Miller
  - TF Future Paradigms, 2005
  - Rovenstine, 2008 *The Pursuit of Excellence*

- Patricia Kapur
  - CSA Bulletin, Summer 2008
  - Rovenstine, 2011 *Leading into the Future*

“Difficult to see, always in motion the Future is...”

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Longnecker DE: Navigation in uncharted waters. Is anesthesiology on course for the 21st century? The 35th Annual Rovenstine Lecture. *Anesthesiology* 1997; 86:736–42

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Miller, RD: The Pursuit of Excellence: The 47th Annual Rovenstine Lecture. *Anesthesiology* 2009; 110 (4, April):714-720

Kapur, PA: Leading Into the Future: The 50th Annual Rovenstine Lecture. *Anesthesiology* 2012; 116(4, April):758-767

Longnecker's Rovenstine 1996

- Cost containment imperative
- Population-based care prioritized above individual care
- Moving to ambulatory and home care instead of inpatient hospital care
- Self-employed physicians searching for stable employment situations
- Non-physician practitioners given more duties wherever possible

Longnecker's Rovenstine 1996

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"...form alliances with surgeons and surgical organizations... ...emphasize perioperative medicine skills … on rotations where partnerships have been formed with surgical colleagues for the overall care of surgical patients... where the CA-3 resident would be "involved in the [entire] continuum of preoperative, intraoperative, and postoperative care of surgical patients..."

Miller's Predictions

Ron Miller — TF Future Paradigms, 2005

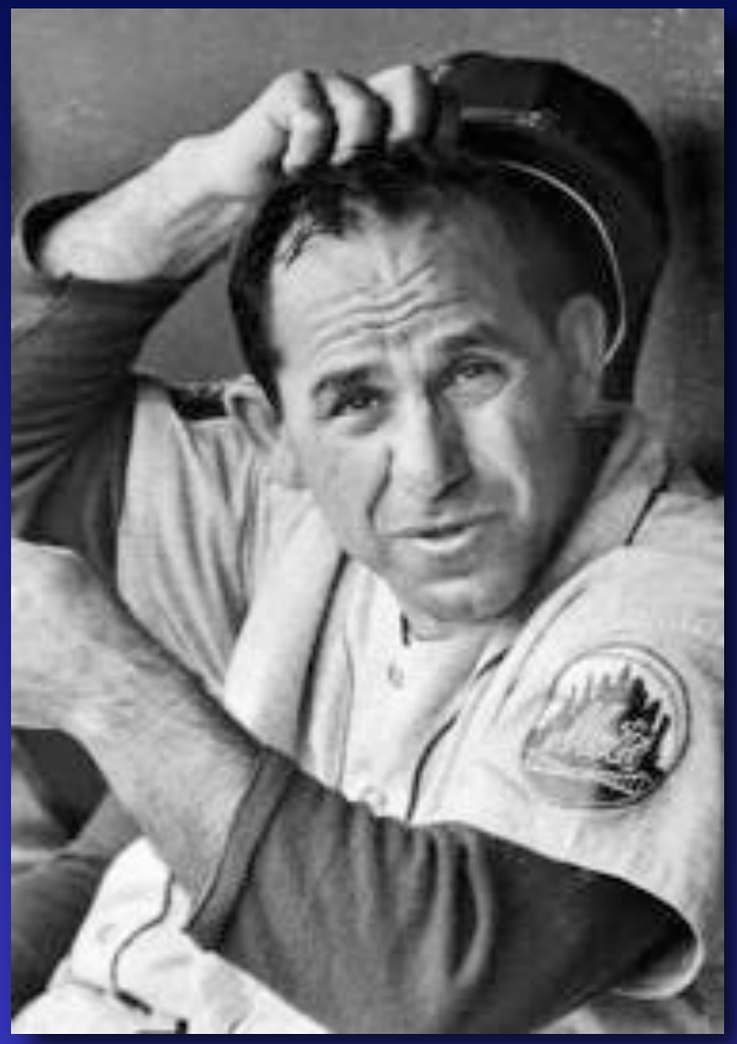
- Demographics, innovations, & economics

Increased critical care, IT with databases and quality/quantity, robotics and voice activation, technical work by care extenders, credentialing based on demonstrated competence rather than training or boards, turf wars, scope of practice, medical procedures instead of surgery, genetic molecular medicine, imaging, drugs based upon pharmacogenomics

How qualified to be intra-op practitioner, supervise how many ? technicians, role of anesthesiologist

Emphasis on throughput and outcomes, systems analysis

Opportunities — preop eval, prepare patients, critical care, pain management



When you come to a fork in the road, take it.

Kapur's Analysis

Patricia Kapur — CSA Bulletin 2008

Technology propels changes:

- non-invasive CV tests, genetic profiling, feedback controlled infusion pumps, remote viewing of OR, telemedicine
- Immediate pre-, intra-, and post-op less technologically demanding and subsumed within broader context of surgical care and long term outcomes

Anesthesia can lead in surgical outcomes:

- Reduce SSI: temp, O2, BS, timely antibiotics, transfusion
- Reduce ischemic events: monitor CV, avoid swings, Hct, shiver
- Reduce pulmonary comp: aspiration, atelectasis, pain, residual block
- Reduce tumor recur: blood, pain immune

Kapur's Advice

Quotes Miller about the rancor re nurse anesthetists:

> *"The time may well be coming when the profession of anesthesiology needs to face that routine, noncomplex levels of care are not going to be the appropriate setting for solo care by highly trained physician anesthesiologists."*

Advises:

> Oversight of straightforward and mid-complex anesthetics, personal care of most complex, subspecialty, critical care, pain, pre-op, manage OR and support services

Point, Click and You're a Doctor

RADFORD UNIVERSITY

SCHOOL OF NURSING

RADFORD UNIVERSITY

...imagine your future in nursing

RU Gains SCHEV Approval to Offer Doctor of Nursing Practice Degree

RADFORD –The State Council of Higher Education for Virginia (SCHEV) on Tuesday unanimously approved the university's proposal for a Doctor of Nursing Practice (DNP) degree, marking the third time in a one-year period RU has received SCHEV approval for a graduate-level program.

The first admitted students to the DNP program, which will be offered in an online distance-learning format, are scheduled to begin classes in the fall of 2010. It is anticipated that the program will enroll 25 students in its first year and employ two faculty members and one administrative professional that specializes in computer distance learning.

American Society of Anesthesiologists

They Don't Share Our Views…

NURSE ANESTHESIA • SAFE ANESTHESIA

Which ones are the anesthesiologists and which are the nurse anesthetists?

CAN'T TELL?

It's *just as hard* to tell the difference between their anesthesia education, the way they administer anesthesia, and their safety records.

American Society of Anesthesiologists Political Action Committee
ASAPC

AANA Newspaper Advertisement

Miller's Rovenstine #1

Defining the path:
trade union v. profession

Trade versus Profession

"Considerable conceptual evidence suggests that medical professions, including anesthesiology, are in danger of becoming trade unions. If so, what is the difference between a profession and a trade union? A trade union is often defined as a collection of skilled workers who deliver a service or product. A profession is a group of individuals who not only deliver a product, but also develop the product (i.e., research) and make decisions regarding how the product is to be delivered."

— Ron D. Miller, M.D.

Miller's Rovenstine #2

- Professional automomy invaded by government, economics, corporations, politics
- Need long-term vision and pursuit of excellence
- Anesthesiologists as perioperative directors

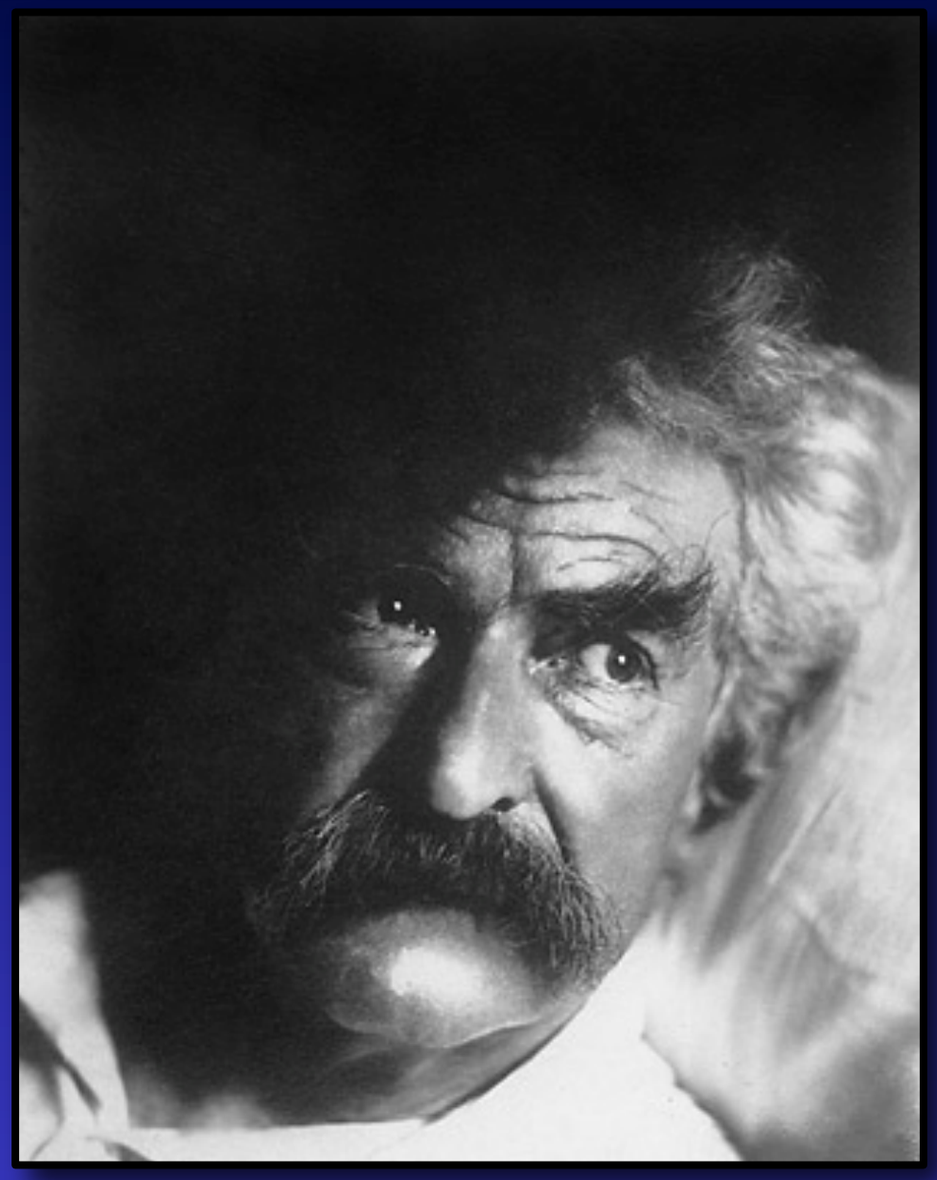
Miller's Rovenstine #2

Miller's Rovenstine #2

- Potential what ifs:
  - Dr. McSleepy
  - Sublingual PCA
  - Dedicated procedure center
  - Surgical resident work hours

Miller's Rovenstine #3

- Research — embrace the problems to be solved:
  - Renal, POCD, SIRS
- Task Forces
  - Anesthesia & Peri-op Medicine
  - Technology & Pharmacology
  - International think task re questions which need answers
- Think Big & Pursue Excellence



Truth is mighty and will prevail.
There is nothing the matter with this, except that it ain't so.

Kapur's Rovenstine #1

- Changes (worldwide)
  - Society, resource availability, technology, pharmacology, genomics, and molecular biology
- Transformation
  - New system of care, payment models, skill sets
- "Disruptive" or "Discontinuous" changes
  - Care to be population-based, full-risk, bundled payments, ACOs, outcomes-based

Kapur's Rovenstine #2

- Healthcare delivery re-design is coming to all of medicine — surgeons, radiologists, pediatricians
- Leveraging costly knowledge and skills to greatest extent
- Practicing at "the top of their license"
- Rethink what we've always done, a new mental map, open our minds to coming changes

Kapur's Rovenstine #2

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- Leveraging costly knowledge and skills to greatest extent
- Practicing at "the top of their license"
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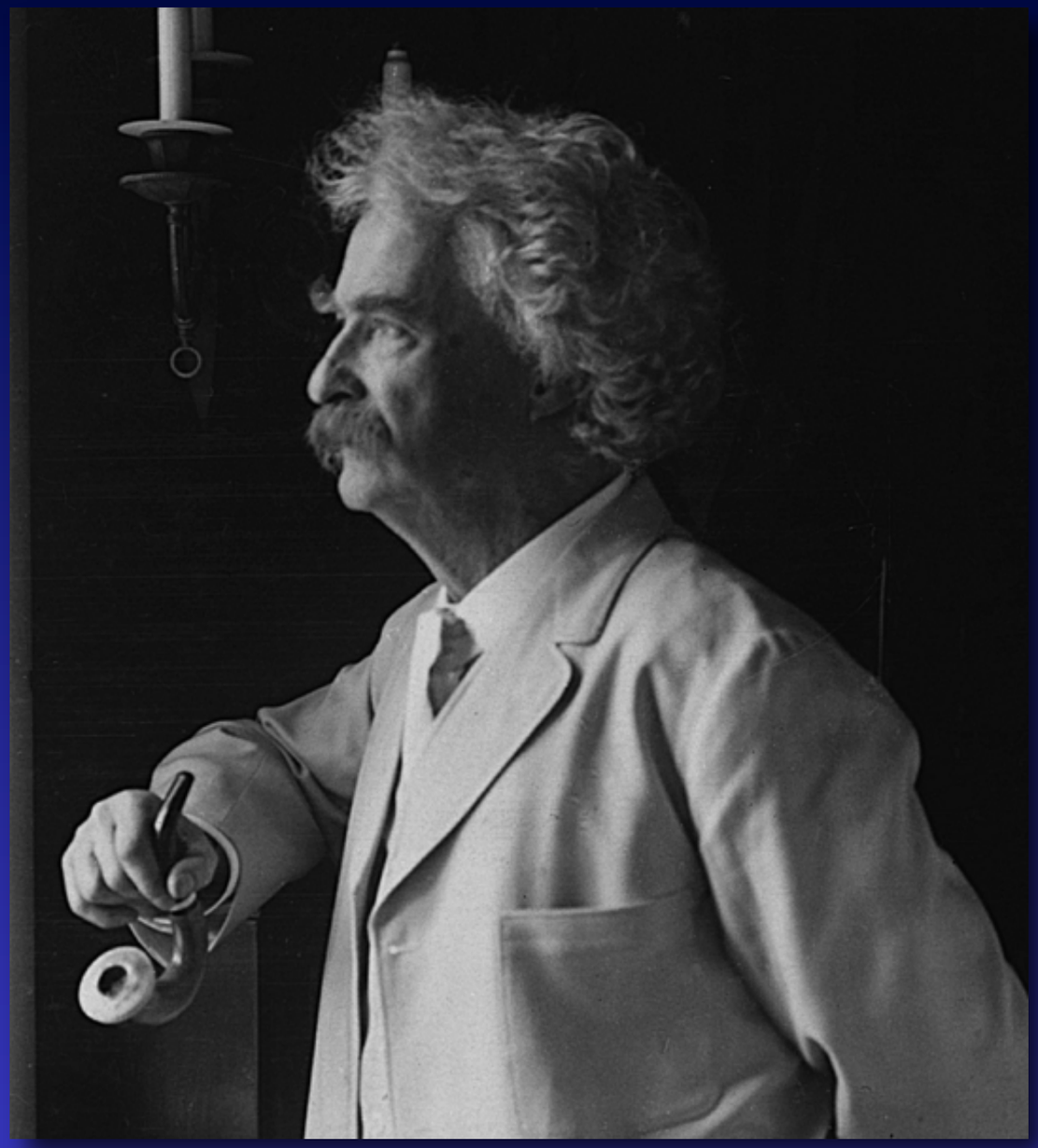
"… we can stay in the operating rooms and lose new opportunities, or alternatively we can embrace a greater commitment to new forms of practice, education, and research."

Kapur's Rovenstine #3

Opportunities for Leadership

- Expanded role of Pain Management for Public Health
- Future of Safety, Quality, and Cost-effective Care
- Using new technology
- — telemedicine (OR & ICU)
- Matching professional resource expenditure to patient co-morbidities, surgical complexity, staff training and experience
- Global/bundled payments — benchmarks, throughput, organization
- Maintain general medical skills
- Perceive and create opportunity in the Future

What's in a name?



“What's the use you learning to do right, when it's troublesome to do right and ain't no trouble to do wrong, and the wages is just the same?”

Kapur's Rovenstine #4

Global/bundled payments

1. We must determine quality benchmarks and equal or exceed them.
2. We must oversee and solve perioperative, periprocedural, intensive care, and pain issues throughout the health system, utilizing a cost-effective mix of providers appropriate for the severity of the cases.
3. We must facilitate procedural through-put at all levels, including critical care.
4. Organizationally we must become integral to the management of all areas where acute care and pain services are being delivered.
5. We need to become the acute care go-to people, the acute care solution, for each of our clinical sites.

Quotations

"...we have excellent anesthesiologists who markedly restrict their full potential to provide a positive impact on public ... safety by delivering one-on-one care to [low-risk] patients who do not warrant such physician-intensive, inefficient, and cost-ineffective care....

How should we best use our physician skills? ...As proven in a number of diverse practice models and in critical care units daily, physician oversight or supervision of well-trained sedation and critical care nurses, nurse anesthetists, and anesthesiologist assistants is a remarkably safe, efficient, and cost-effective model ... while there is still a need for one-on-one or even more intensive care provision to those [specific] patients who need physician skills.

"... will we ... lead the development of practice models [intensive care model and others] that ensure all patients have the benefit of anesthesiologists involved in their care? ... everything...except for our core values of providing, overseeing, and improving the care of critically ill patients and those with acute procedural or chronic pain, can ... and must change as our environment changes. ..."

— *Mark A. Warner, M.D., 2005 Rovenstine*

- John B. Neeld, Jr., M.D.

ASA President, 1998-1999

Rovenstine 2013 "Winning the War"

http://education.asahq.org/2013Rovenstine

Needl's Rovenstine #1

- Aggressive legislative & regulatory efforts by AANA with goal of dismantling MD-led ACT
- Need to prove our role in preventing mortality & major morbidity as leaders of the ACT
- Definitively prove our role by showing value added in patient outcomes
- Concern for welfare of patients should AANA achieve its long sought after goal of independent practice

Neeld's Rovenstine #2

- 10% of Medicare population accounts for 70% of spending
- Only 10% of spending for this high cost group is for ER or hospital admissions, for visits that are preventable

Neeld's Rovenstine #3

- Estimated MD shortage by 2020:
  - 46,100 PMD
  - 45,400 Specialists
  - 4479 anesthesiologists

BUT surplus of 7970 nurse anesthetists

- AANA claims that nurse anesthetists are the solution to access and cost issues under ACA if they are relieved of supervision requirements

- AANA supported by AHA, AARP, Robert Wood Johnson Foundation, & the Feds

Neeld's Rovenstine #4

Additional federal perversions:

ACA section 2706 — the "non-discrimination" issue

Federal Trade Commision

- Pain management in Alabama — ABME chilled
- Dental whitening in North Carolina

Needd's Rovenstine #5

What outcome studies are available?

- Cromwell. *Health Affairs* 2010.
  - "No harm found" with opt-out before and after
  - "Outcomes did not vary greatly," but trend in their own data
  - "Training essentially equivalent" — 2 1/2 versus 8 years after B.A.
  - "Nurse anesthesia is more cost effective."

- Beecher & Todd 1954 = 1:1560 anesthetic deaths
- Eichhorn 1970 = 1:200,000 (ASA 1&2 reported to Carrier)
- LaGasse 2002 = 1:13,000

Needl's Rovenstine #6

- Bechtoldt 1981
  NA = 1:20,723
  MD = 1:24,500
  ACT = 1:28,166

- Silber 2000
  - Death rate
  - In hospital complication rate
  - Failure to rescue (FTR) which is the rate of death after complications
    = 2.5 excess deaths/1000 patients
    = 6.9 excess FTR/1000 patients

References for outcome studies

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Neeld's Rovenstine — the Big Ask

WE DO NOT HAVE HAVE CURRENT OUTCOME STUDIES.

We need 30 day outcomes in comparable patient populations.

Neeld asks for ASA to spend $1,000,000 to fund such studies and that FAER manage the distribution of the grant monies.

The Charge to the STA

Society for Technology in Anesthesia

- The Society's mission is to improve the quality of patient care by innovation in the use technology and its application.
- The Society promotes education and research, collaborates with local, national, and international organizations, sponsors meetings and exhibitions, awards grants, and recognizes achievement.

STA's charge

Define, Demystify, and Promote:

Define the broad parameters of how STA and its members can serve a là Neeld's Rovenstine

Demystify — by using technology — the moving parts of hidden costs, efficiency, and performance measurement

Promote anesthesiologists as the leaders of innovation in clinical care

STA's charge

What to measure technologically (at the point of care) to compare practitioners:

Morbidity, mortality, patient satisfaction, complication ratio, necessity to rescue, failure to rescue, degree of difficulty 1.2 or 2.6 or 3.9, decision theory, efficiency meter

STA's charge

STA's charge

It's not the gadgets we use,
it's the logic of how we choose to do what

STA Annual Meeting 2014 Program Objectives

1. Examine and identify problems and potential solutions in the anesthesia work space with a special emphasis on exploring new developments in drug delivery, airway management, information management and patient monitoring.
2. Identify and explore key factors required for effective translational medical research, including conflict of interest management and implementation of successful strategies to develop technologies.
3. Examine and identify barriers and potential solutions in order to bring new and safe technologies to the clinical practice with a special emphasis on federal regulations, patient monitoring, information management, and patient safety.
4. Explore opportunities to advance and enhance environmentally responsible practices within anesthesia care.
5. Explore opportunities to advance safe, interoperable, automated anesthesia systems in order to improve patient safety and outcomes.

STA's charge

Beyond

Drug delivery, airway management, information management and patient monitoring

New and safe technologies to the clinical practice with a special emphasis on federal regulations, patient monitoring, information management, and patient safety.

Advancing safe, interoperable, automated anesthesia systems in order to improve patient safety and outcomes

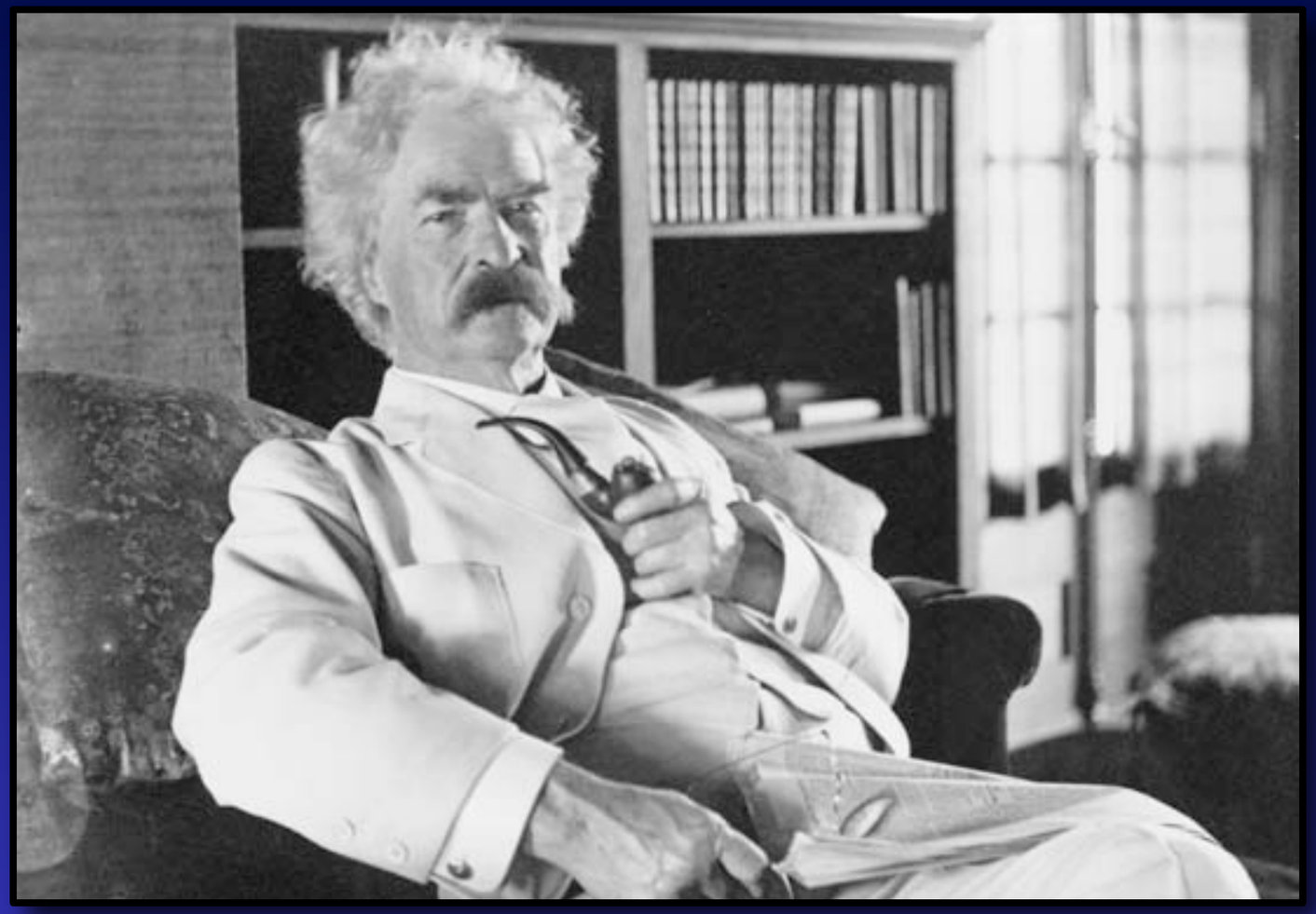
- New tools to demonstrate clinical value (Value = Outcome/Cost)
- New paradigms for safety and efficiency
- Technologic assimilators of clinical data into measures of performance
- Automation of research at the point of care
- Rather than asking how to make care more efficient, new paradigms for asking whether we should do it at all
- Innovate our way out
- IT integration and interoperability
- Integrated prompts for emergency or unusual circumstances

Because you "made" me, now you must rescue me

- *Your ongoing innovations bring great clinical benefits to patients*
- *Technology can be a voracious consumer of resources*
- *There are serious unintended consequences of "technology gone wild"*
- *Some significant part of your energies must now be directed toward responsible restraint, and maybe even constraints*
- *Part of your professionalism now is to rescue Medicine from being dumbed down*

The Takeaway

- *Remember why you are here*
- *Appreciate the possibilities*
- *Listen*
- *Look under the hood*
- *Pursue Excellence*
- *Be open to new paradigms*
- *Everything is possible*
- *Trust, but verify…*



"Sometimes I wonder whether the world is being run
by smart people who are putting us on
or by imbeciles who really mean it."