

# **Research, Learning Health Care Systems and PBRNs in the Age of Electronic Data**

Wilson D. Pace, MD, FAAFP  
Professor, Department of Family Medicine  
University of Colorado Denver  
Green-Edelman Chair Emeritus for Practice-base Research  
CEO, DARTNet Institute

# Disclosure Statement

- Research Funding: Sanofi US, Mallinckrodt, Genova Diagnostics, Novo Nordisk, Merck, Pfizer, Lilly
- Stock Holdings: Pfizer, Merck, GSK, Novo Nordisk, Novartis, Abbott
- Off Label Medication Use: Off label medication findings from PBRN members will be discussed

# US Health Care: Less for More?

- USA spends ~100% more than any other country on health care
- USA ranks poorly in all major health outcomes compared to all other industrialized countries
- Has any country ever received **so little** for so much as what we get from our health care dollar?

# National context

- Health care value assessment critical
- Improved methods for comparative effectiveness, quality and dissemination
- New models of data acquisition
- Systems that combine basic scientists, clinical researchers, clinicians, patients and communities
- Approaches that can drive quality and effectiveness while expanding knowledge

# Can't Be Business as Usual

- Payment system and clinical care delivery system must fundamentally change
- Hospitals become cost centers **NOT** profit centers
- New collaborative models to ask and answer questions must be formed
- **Research and practice advances must be united and transformed**

**How Did We Get  
Here?**

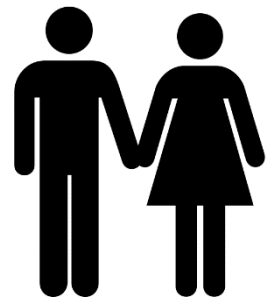
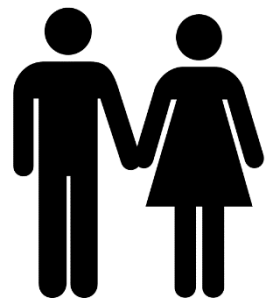
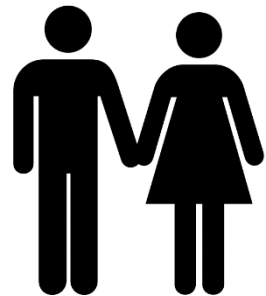
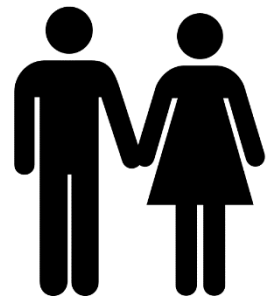
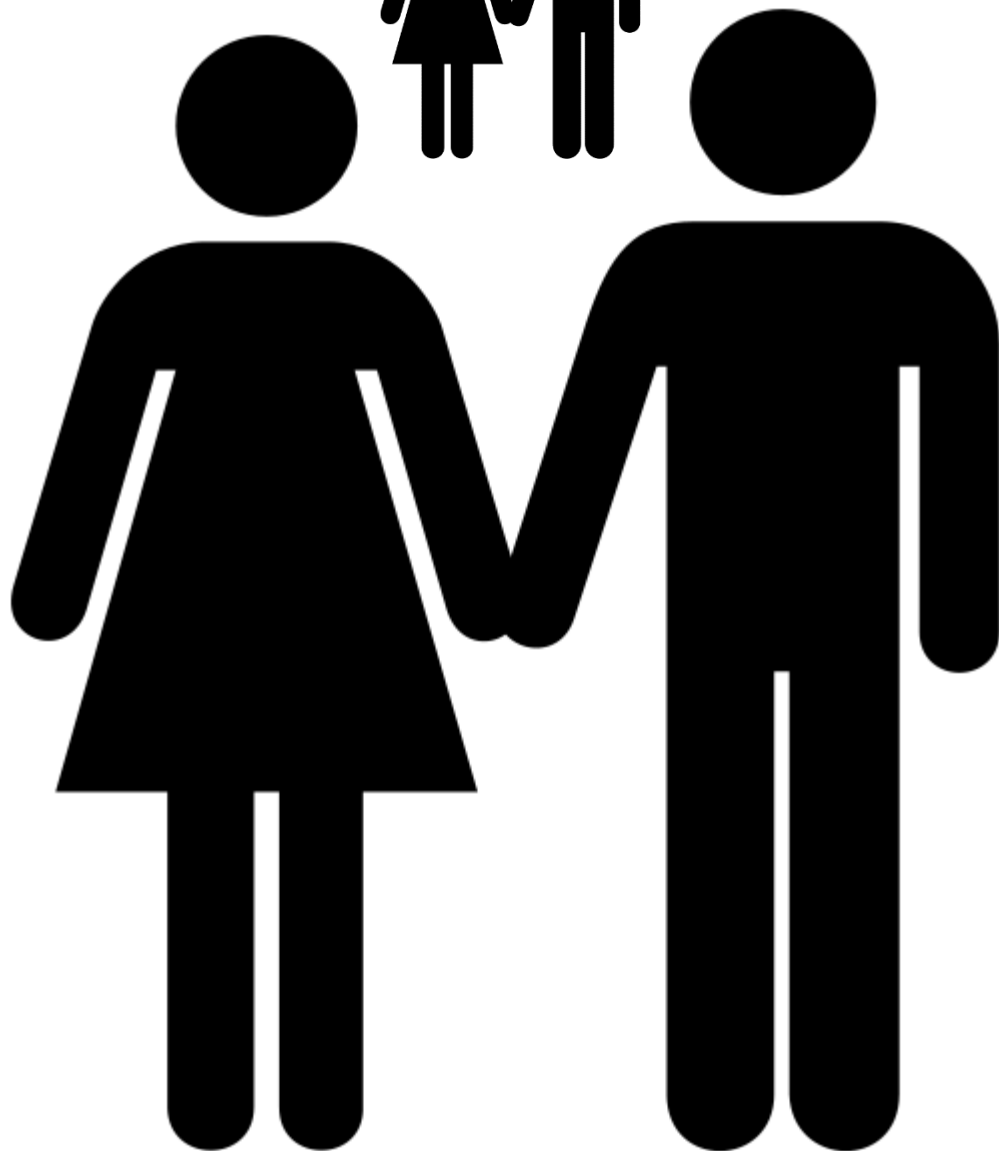
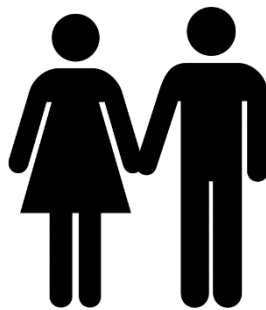
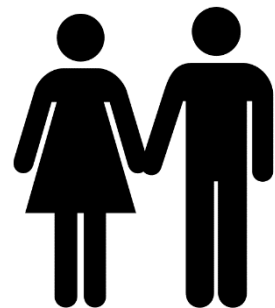
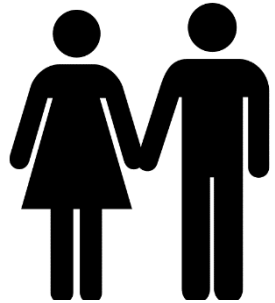
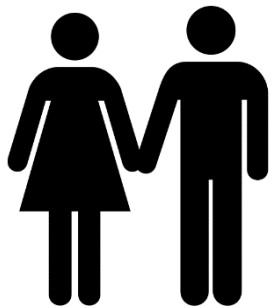
**I wonder what it was like...**

**In The Beginning...**

# **The first research project**

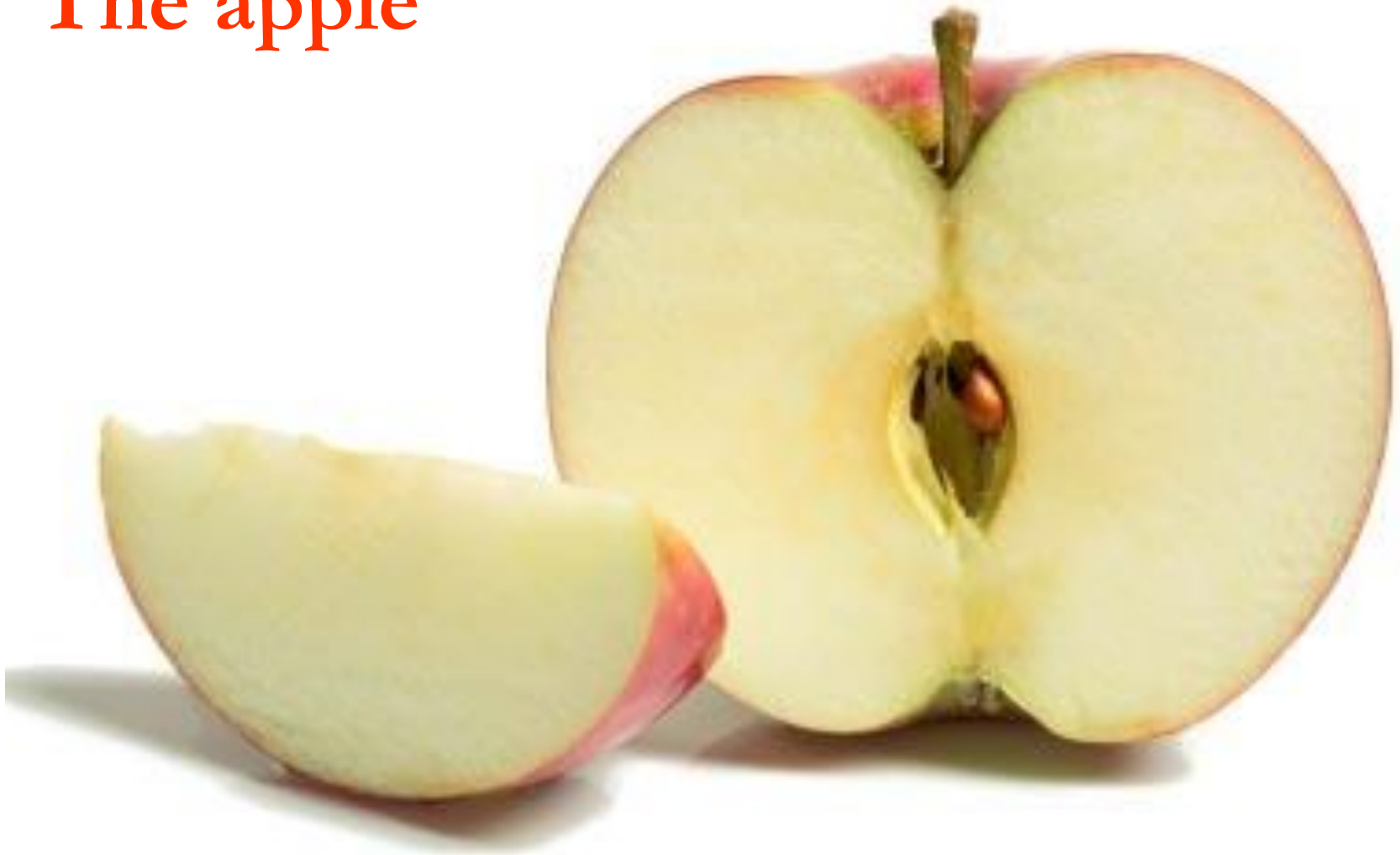






**The effect of deception in a  
group of educationally  
naïve humans**

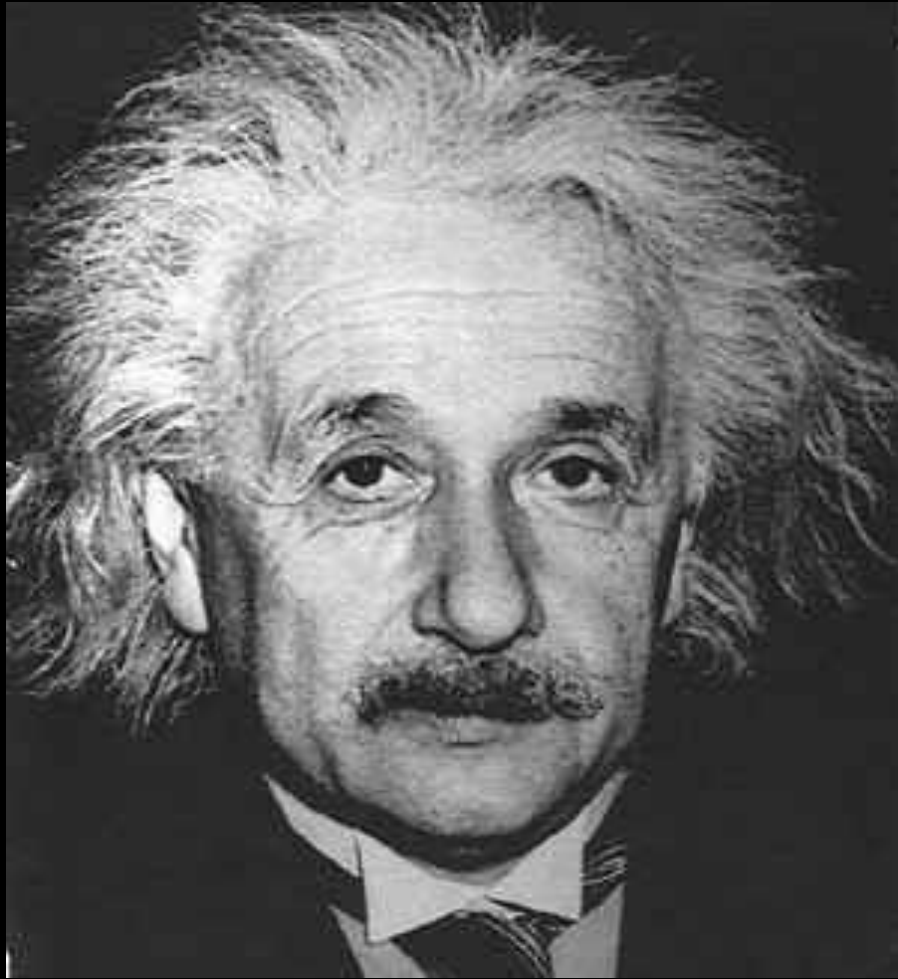
# The apple



*Wanting to do this right, God sought  
the approval of the interplanetary  
group of responsible top brass*



Benefit:



Knowledge

Risk:



Death

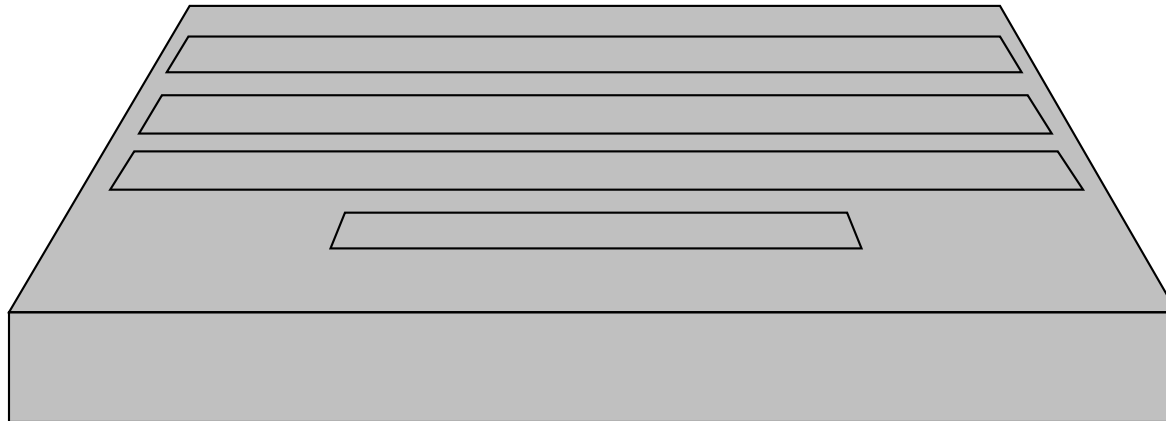
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et to  
tand





Dear God:

Fascinating and  
innovative! But the  
title is not working  
for us. Too long and  
"researchy". And we  
definitely don't get  
the apple. Why not  
something exotic,  
like...





# *The Pomegranate*



God prepared a resubmission

**The effect of deception in a  
group of educationally  
naïve humans**

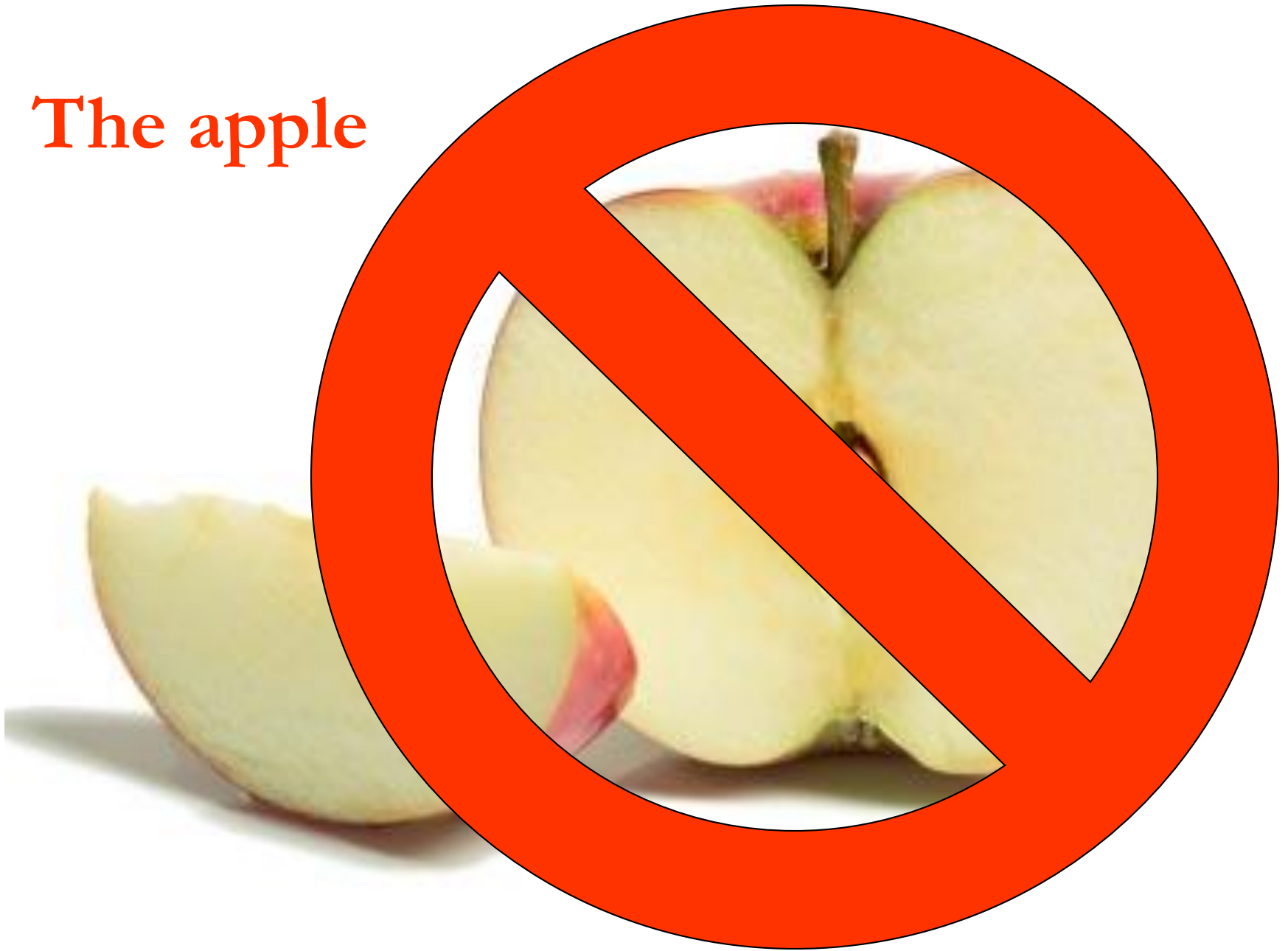
# The Effect of Deception in a group of Educationally Näive humans

....Or.....

# *The EDEN Project*



The apple



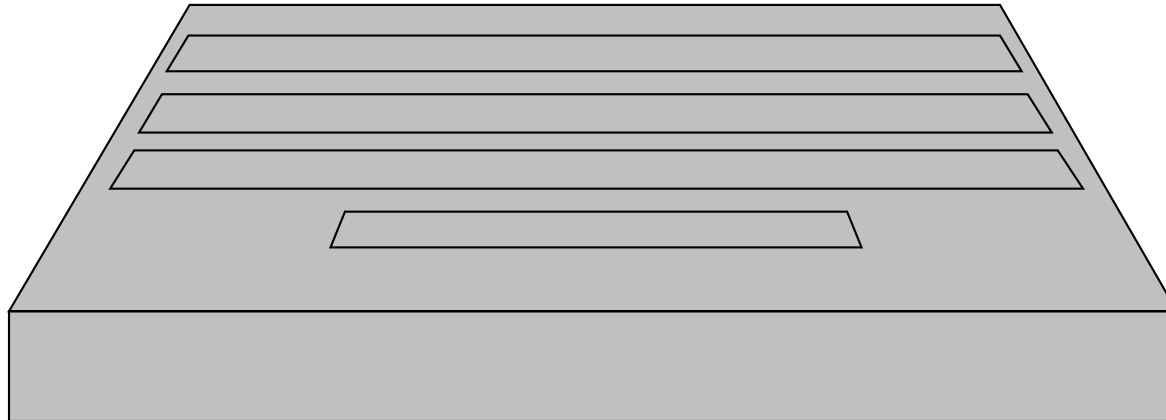


# *The Pomegranate*



Dear God:

We are writing to you  
about the EDEN  
project. We LOVE  
it!!!!!! But what's  
the deal with the  
pomegranate...  
Why not something more  
simple and delicious -  
like...





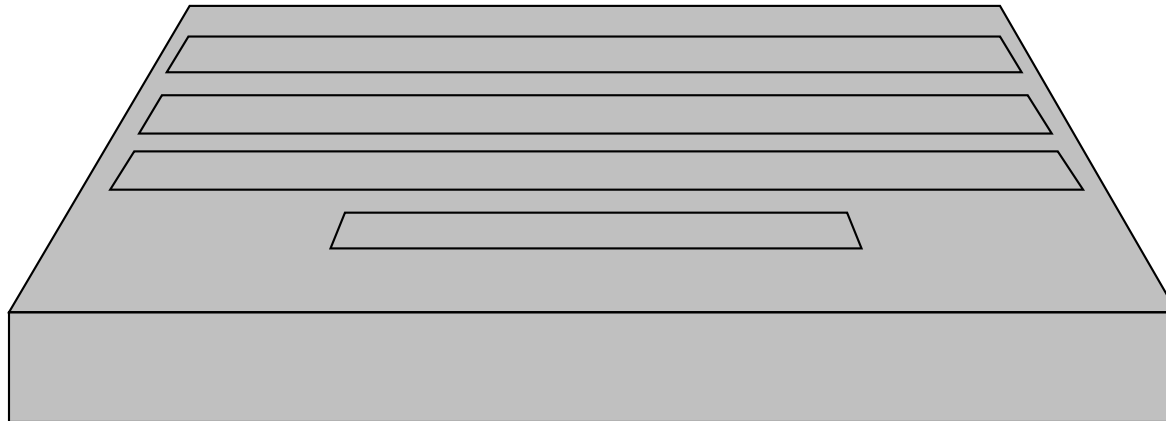
# The apple

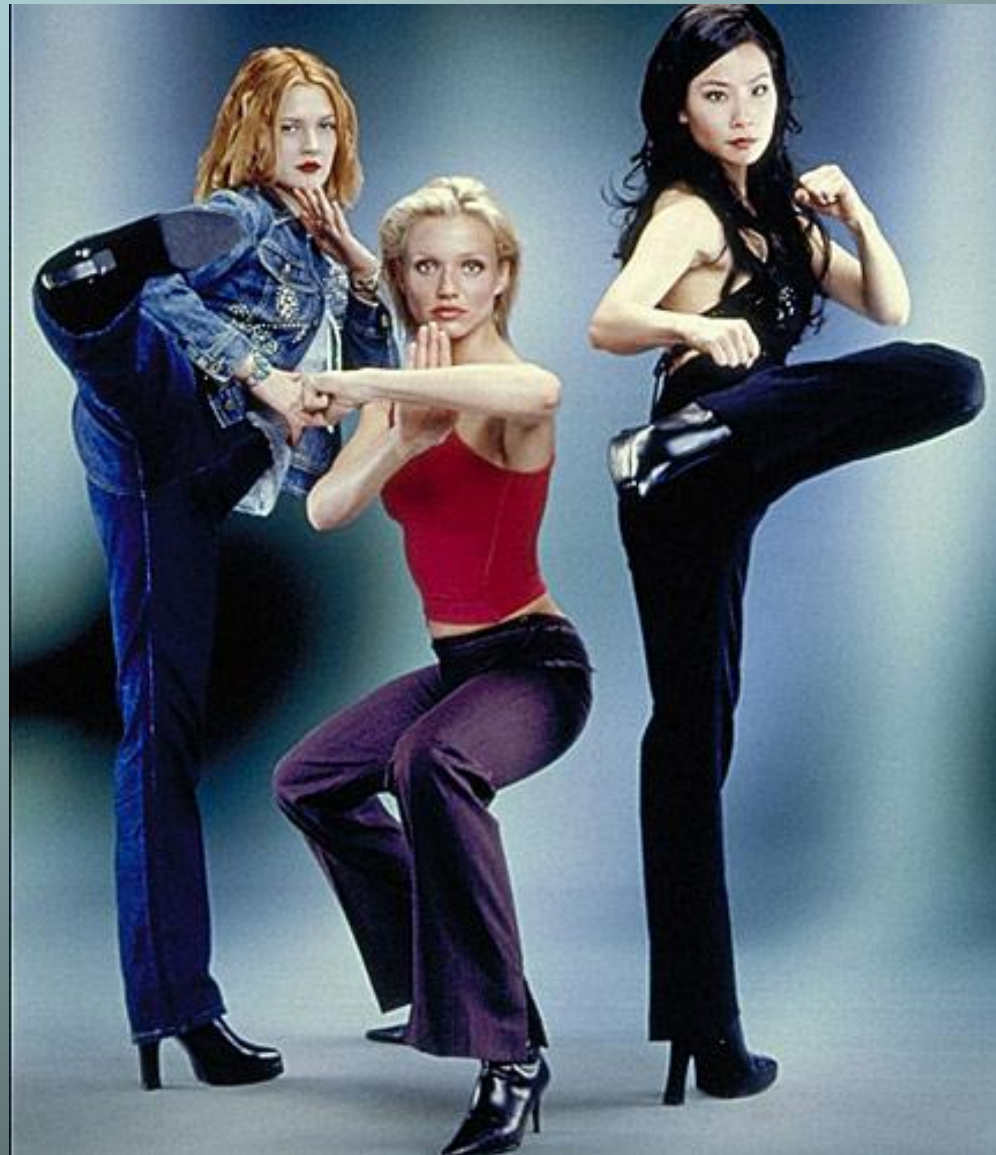


God responded

*“But the Angels are the ones  
who wanted the pomegranate”*

That was the Angels  
from California. We  
sent the  
resubmission to a  
different review  
group.





**The apple is BACK!**



**Human beings'  
insatiable drive to  
acquire new knowledge  
was confirmed**



# God thought

*“We need a neater way to investigate questions about human behavior”*

*A Neater way to Investigate  
questions about Human  
behavior*

**....Or.....**



*NIH*

*And you might  
wonder if there  
really is an  
interplanetary  
group of responsible  
top brass*

*An Interplanetary  
group of  
Responsible top  
Brass*

**IRB**

***... so here we are!***

Thanks to Richard Wender, MD for this story

# Main Focus of NIH Research for 30 Years

**Cells**

**What's  
possible?**

**Exp. Animals**  
**Cells/Tissues**  
**Biochemistry**

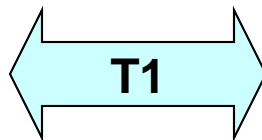
**Basic  
Research**

**Diseases**

**Can it  
work?**

**Phase III Trials**  
**Phase II Trials**  
**Phase I Trials**

**Human  
Research**



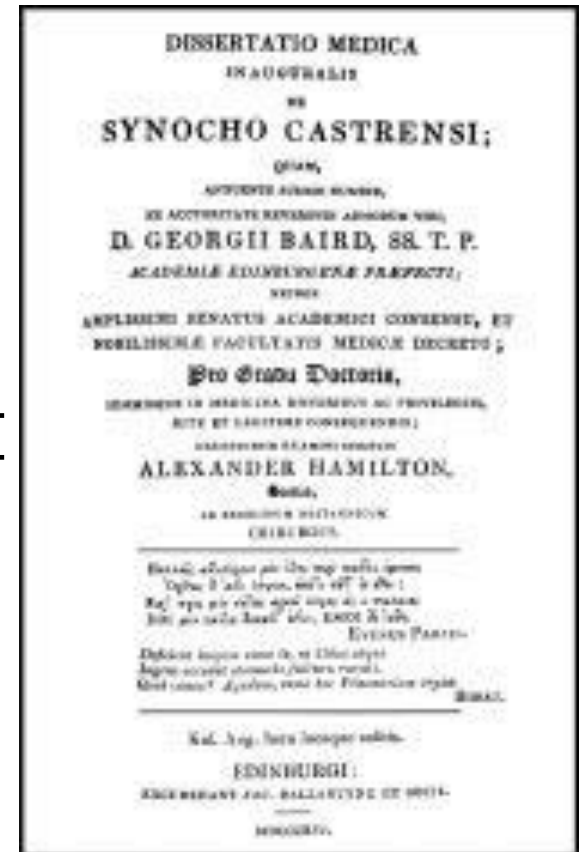
## **Come Down to the Contest...1660's**

Come down to the contest ye Humorists: Let us take out of the Hospitals or the camps or elsewhere, 200, or 500 poor People, that have Fevers etc. Let us divide them in Halfes, let us cast lots, that one half of them may fall to my share and the other to yours; I will cure them without bloodletting...; but do you do as ye know. We shall see how many Funerals both of us shall have: But let the reward of the contention or wager, be 300 Florens, deposited on both sides: Here your business is decided.

It had been so arranged, that this number was admitted, alternately, in such a manner that each of us had one third of the whole. *The sick were indiscriminately received, and were attended as nearly as possible with the same care and accommodated with the same comforts.* Neither Mr. Anderson nor I ever once employed the lancet. **He lost two, I four cases; whilst out of the other third [treated with bloodletting by the third surgeon] *thirty five patients died.***"

Milne I and Chalmers I. J Epidemiol Community Health 2002;56:1a

## 1809 Trial?



## **Over 100 Years Later**



**During the last  
decades we  
have certainly  
bled too little**

**William Osler, MD**



# Have We Made Progress?

**Newsweek**



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**LIFE/HEALTH**

THE WAY WE LIVE  
AND WHY

[HEALTH](#) • [LIFE](#) • [STYLE](#) • [VIDEO](#)

ON SCIENCE | **Sharon Begley**

## Why Doctors Hate Science

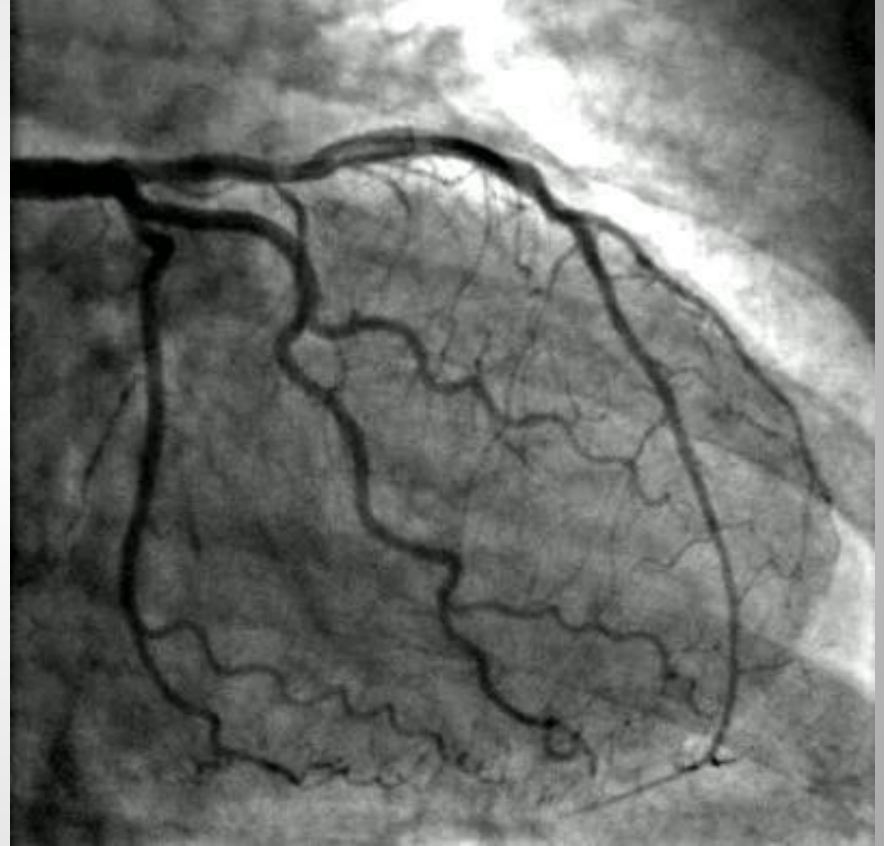
Scaremongers warn that 'effectiveness research' threatens the lives of Americans.

Published Feb 28, 2009

*From the magazine issue dated Mar 9, 2009*

**“It's hard not to scream when you see how many physicians, pharmaceutical companies, [and] medical-device makers...seem to hate science... These days the science that inspires fear and loathing is comparative-effectiveness research.”**

# Acute MI and the Occluded Artery

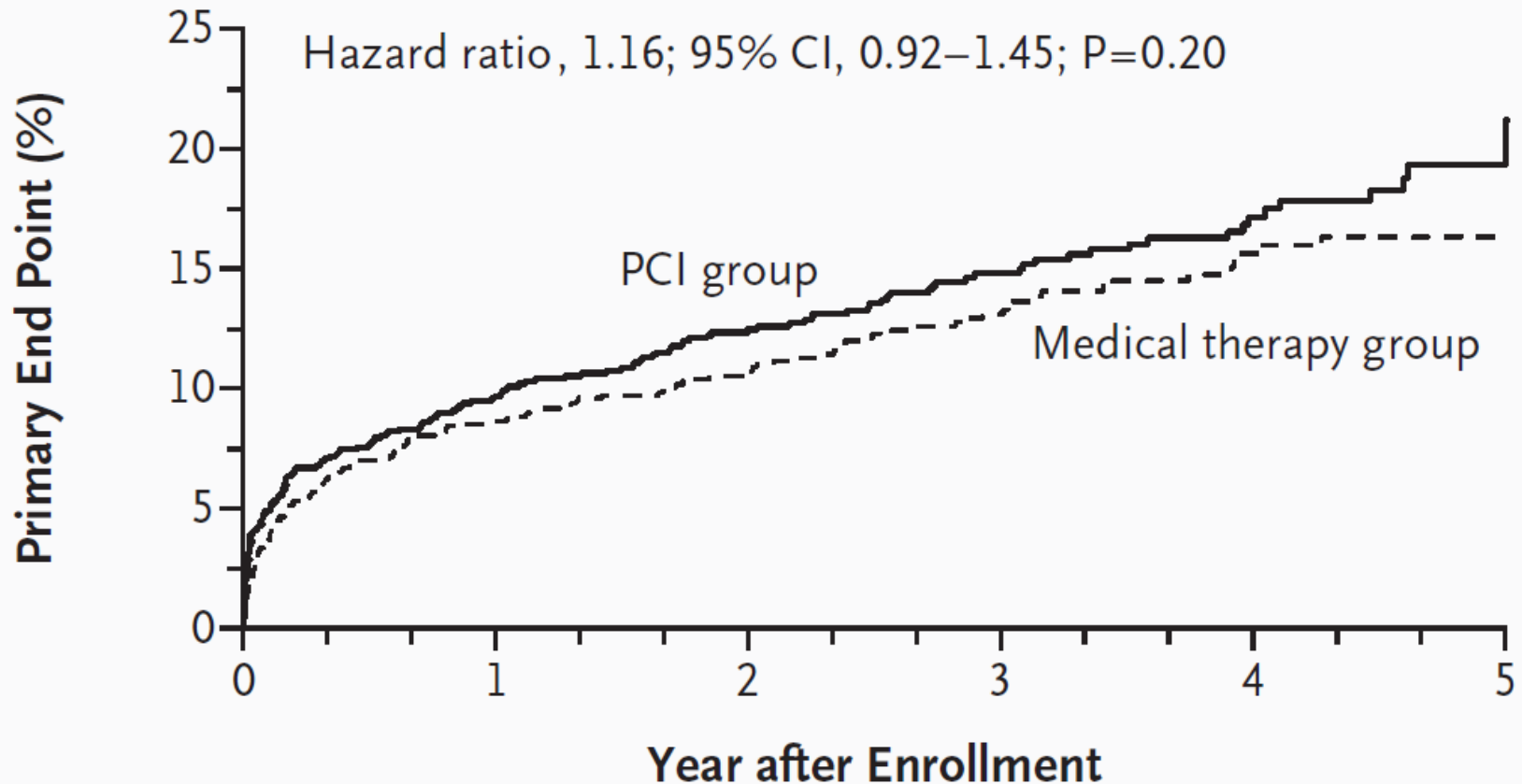


# What to Do with a Blocked Artery?

Researchers tried to organize a randomized study of the benefits of angioplasty for patients who had suffered a heart attack three days or more before

***Many doctors were so convinced of the value of this procedure...that they thought it would be unethical to assign any patients to the control group, which would get all the best medicines for this condition but not the artery-reopening procedure***

# The Results! (n=2,166)



Hochman JS. N Engl J Med 2006;355:2395-407

Antman EM et al. JACC 2008;51:210-47

**Cells**

**Diseases**

**People**

**Practices**

**What's possible?**

**Can it work?**

**Will it work?  
Is it worth it?**

**Who does it work for?**

**Exp. Animals  
Cells/Tissues  
Biochemistry**

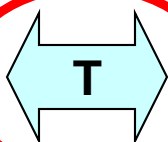
**Phase III Trials  
Phase II Trials  
Phase I Trials**

**Meta-analyses  
Guidelines**

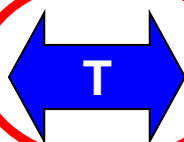
**Best Practices  
Cost-effectiveness  
Phase IV Trials**

**Re-engineering  
Facilitation  
Comparative  
Effectiveness  
Implementation  
Dissemination**

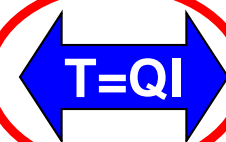
**Basic  
Research**



**Human  
Research**



**Practice-  
Based  
Research**



**Practice**

**Not ready for humans**

**Not ready for patients**

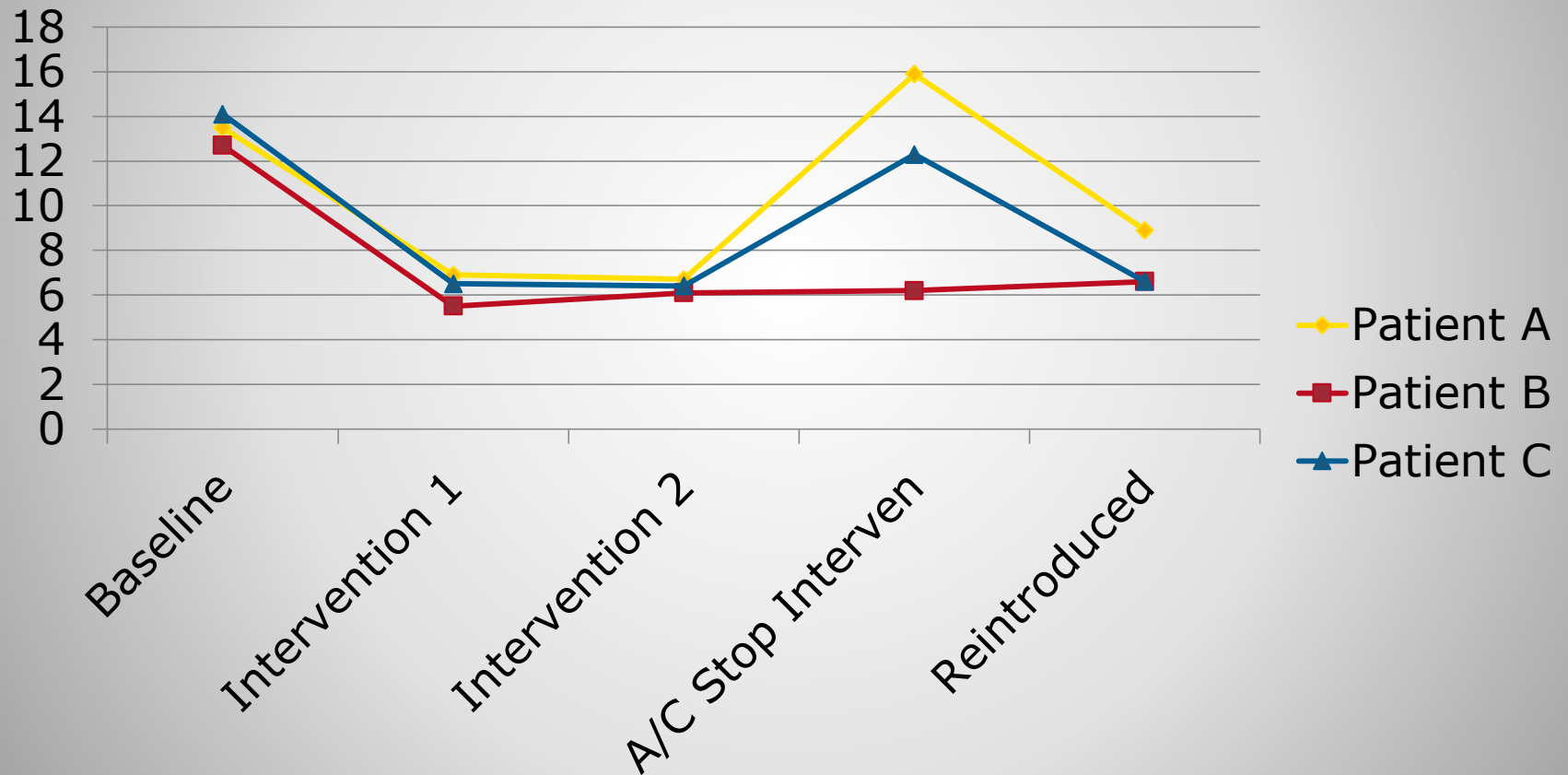
**Not ready for practice**

# Two Way Arrows?

- DPP-IV inhibitors effect on psoriasis
- Effect noted by PBRN physicians shortly have release (Oct. 2006)
- **Sitagliptin, a Dipeptidyl Peptidase-IV Inhibitor, Improves Psoriasis**

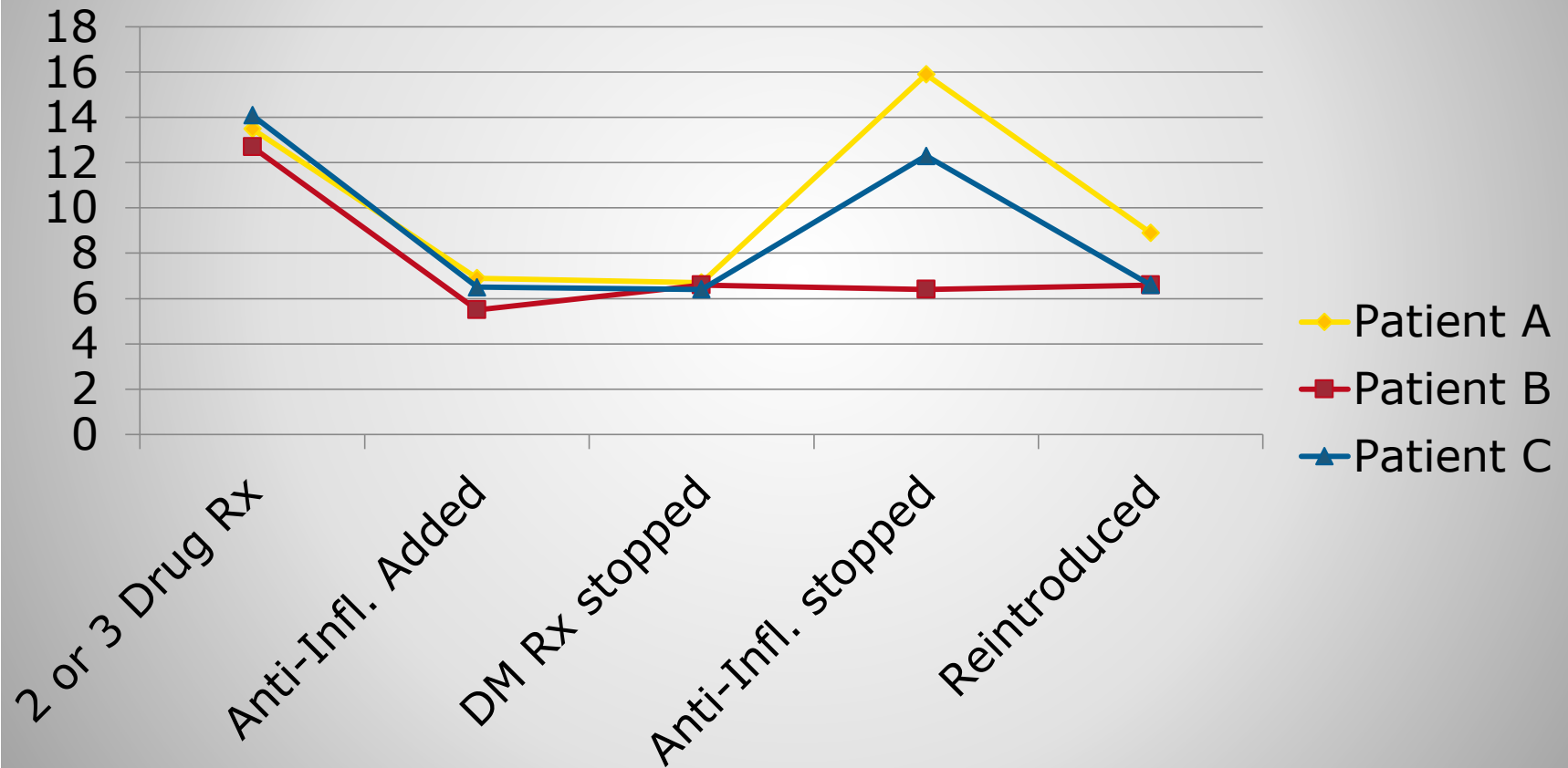
Noshioka T et al Dermatology 2012; 224:20-21

# What happened here?





# Anti-inflammatories for DM?



# **NC AAFP NRN Physician Approached by Sheriff**

- Arrests for illegal opioids up markedly
- 75-80% of the drugs are prescription medications being diverted
- Could the medical community do something?

# Worked with Local QI/Network Team

- Taught use of state registry
  - Taught use of rule of 7
  - Taught use of urine testing
  - Other activities
- 
- **One year later prescription arrests down 300%**

Bujold, E et. al. J. of Opioid Mgmt. Nov-Dec 2012;8:363-367

## **Research Focus of PBRNs Differs**

- PBRNs study the “sharp end” of practice, using data gathered in the course of providing care to unselected patients.
- Health services research tends to focus on the blunt end of practice, using secondary analysis of administrative data sets.
- Randomized Controlled Trials typically enroll non-representative patients.

# Why do we Care?: Selection Bias in Clinical Trials

- SHEP Trial: large RCT of treatment of HTN in elderly, only 24% participation rate
- Diabetes Prevention Trial: approximately 10,000 patients screened for <1000 enrollees
- 10 studies in regional PBRN participation rates were 84% to 96%
- AAFP NRN trials typically >80% participation rates with almost no exclusion criteria

# The Ecology of Medical Care

Green LA. Fryer GE Jr. Yawn BP. Lanier D. Dovey SM. *NEJM*.  
344(26):2021-5, 2001 Jun 28.



# What we Need:

## PRACTICAL CLINICAL TRIALS

- Bold in the issues studied
- Creative in your intervention approach/synthesis
- Practical in intervention delivery
- Thorough in selecting a design
- Broad in what they measure
- Transparent (TREND\*) in reporting

\* Des Jarlais, DC, et. al. (2004) *Am J Public Health* 94(3):361-366



# What to Look For:

## PRACTICAL CLINICAL TRIALS

- Do They Include Multiple Relevant Health Outcomes?
  - More than knowledge and blood assay
  - Outcomes relevant to patients, purchasers, clinicians, policy makers and the public
  - Include quality of life
  - Include economic outcomes

# Taking Research to Scale

- Kidney Disease Outcomes Quality Initiative (KDOQI) are a mixture of evidence based information and expert opinion
- Reproducibility of efficacy studies has been variable
- No trials that look at impact of implementing the entire set of guidelines



- Cluster randomized trial to implement KDOQI guidelines in 36 primary practices through clinical decision support versus full TRANSLATE model
- Tracking all outcomes through EHR and claims data
- Currently 24,000 patients with CKD in the study

# Information Systems Support

- Clinical decision support at point of care
  - Adjust recommendations to new information or nuanced situations – high K<sup>+</sup> and ACE/ARB
- Registries are highly desired
- Feedback reports at practice and clinician level
  - Missed opportunities reports may work better than traditional quality metrics

# Broad Array of Outcomes

- Intermediate outcomes
  - Increased screening
  - Improved diagnosis (less under and over)
  - Change in eGFR
  - Change in ACR
- Patient outcomes that matter
  - Stage 5 / ESRD
  - Death – linkage to NDI

# Adverse Outcomes

- Adverse effects
  - Number of individuals who develop hyperkalemia
  - Rate of Hip, forearm or clavicle fractures on and off ACE/ARB
  - Instances of acute renal failure

# **Look to a New Model of Research**

- Study / improve care in real settings
- Look for a long-term relationship with the research team
- Look for designs that are inclusive
- Expect interventions that can be maintained
- Find measures important to patients
- Have fun



# How can I get involved?

- "Hard work spotlights the character of people: some turn up their sleeves, some turn up their noses, and some don't turn up at all." -*Sam Ewing*
  - ***Show up!***
- "Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing had happened."  
-- *Winston Churchill*
  - ***Pay attention and don't hurry off!!!***

# Why should I get involved?

- *F.P. Jones*: "Experience is that marvelous thing that enables you to recognize a mistake when you make it again."
  - **Get involved** *to share your experience*
- *P.L. Berger*: "In science as in love, too much concentration on technique can often lead to impotence."
  - **Get involved** *to do research without knowing how*
- *Confucius*: "Tell me and I'll forget; show me and I may remember; involve me and I'll understand."
  - **Get involved** *to learn how*

# Help Generate New Knowledge

- Question the status quo
- Collect data that matters
- Share your observations
- Participate in research

■ **JOIN A PBRN!**

# Contact Information

- Wilson Pace, MD, FAAFP  
CEO, DARTNet Institute  
[Wilson.Pace@dartnet.info](mailto:Wilson.Pace@dartnet.info)
- Deborah Graham, MSPH  
COO, DARTNet  
[Debbie.Graham@dartnet.info](mailto:Debbie.Graham@dartnet.info)