



An Unexpected Journey: A Hedgehog in Academia

David C. Aron, MD, MS

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R

RESTRICTED



UNDER 17 REQUIRES ACCOMPANYING
PARENT OR ADULT GUARDIAN

www.filmratings.com

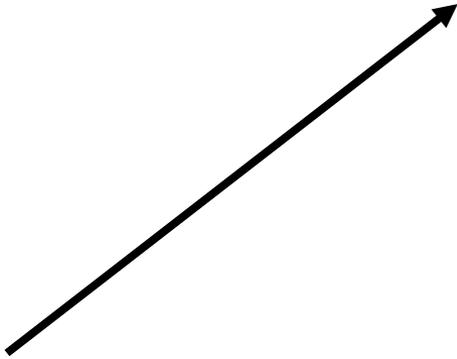
The following **presentation is rated R** (opining and sarcasm may “inadvertently” seep in) Viewer discretion is advised, but feel free to challenge everything I say.

Disclaimer: The opinions expressed in the following presentation are solely those of the presenter, and do not represent those of any agency or organization

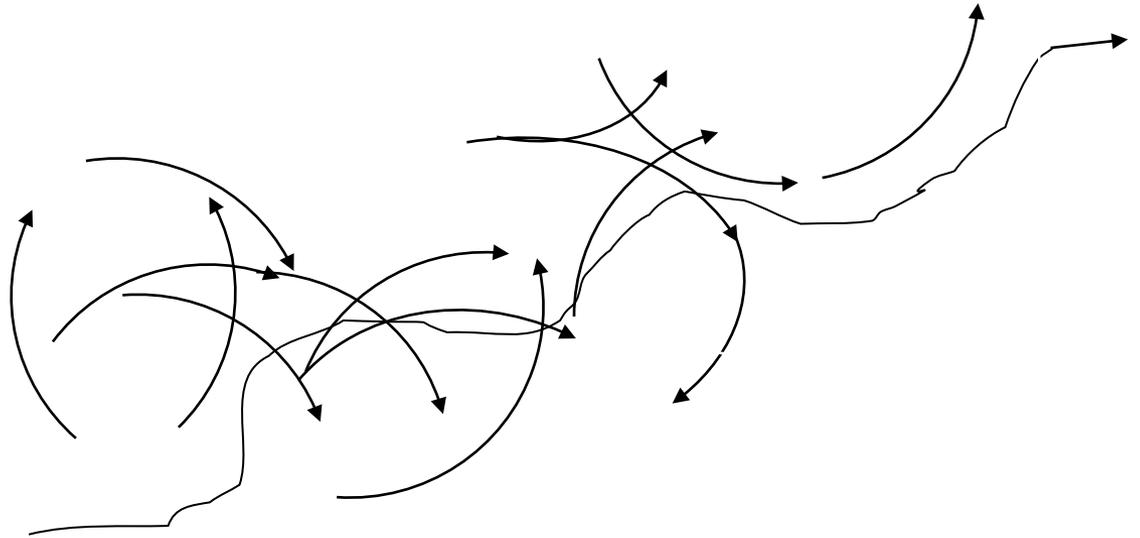
Disclosures: no money from Big Pharma, Medical device companies, etc.

“The fox knows many things, but the hedgehog knows one big thing.”





Path 1 – the tried and true
method of academic
success.

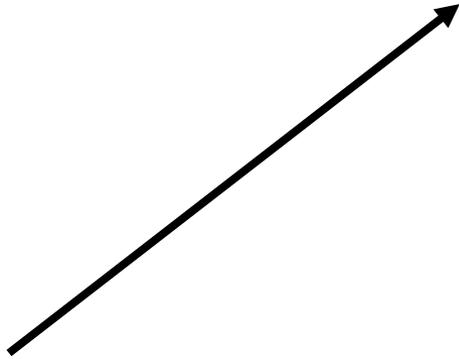


Path 2 – my path

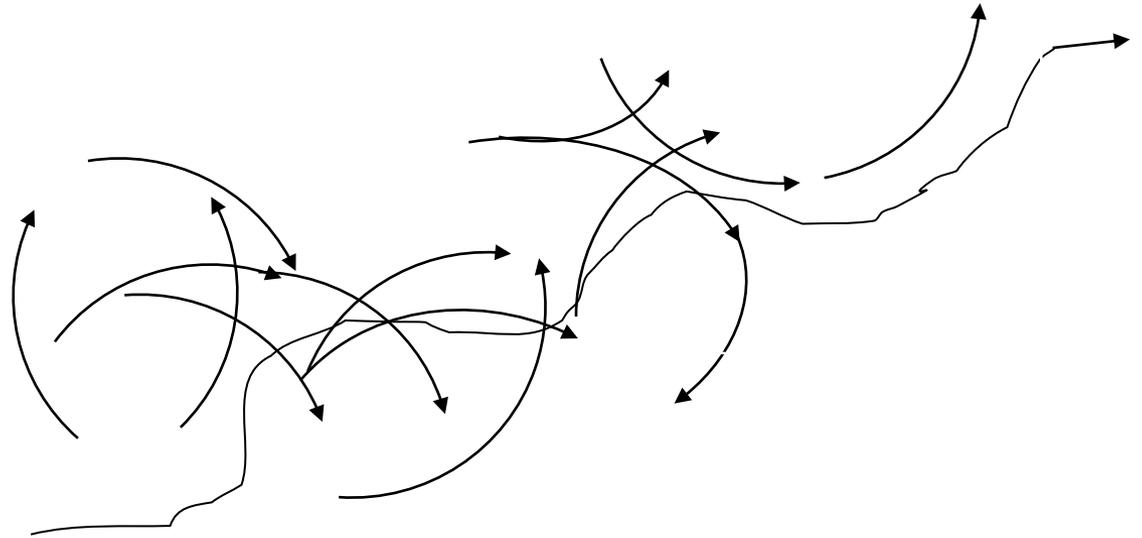


“The fox knows many things, but the hedgehog knows one big thing.”





Path 1 – the tried and true
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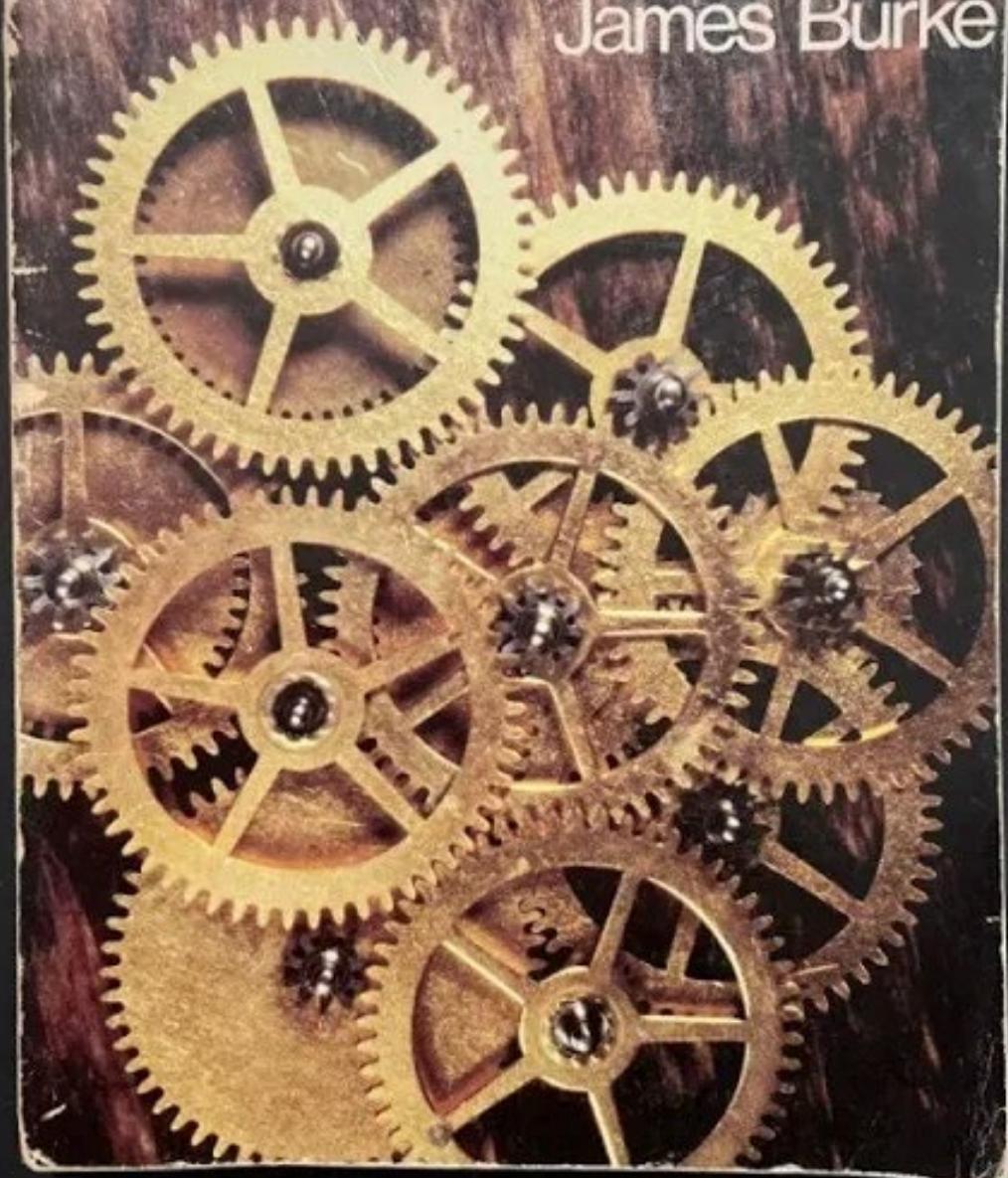


Path 2 – my path



CONNECTIONS

James Burke



Bethel CR, Vitullo JC, Miller RE, Aron DC. Molecular cloning of mouse insulin-like growth factor binding protein 4 (IGFBP4) cDNA and expression of a fusion protein with IGF-binding activity. *Biochemistry and molecular biology international*. 1994 Sep 1;34(2):385-92.

This would become very useful when I had to teach patient safety to first year medical students who thought that medicine = molecular biology.

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CATGCTGCCCTTCGGCCTCGTGGCCGCCCTGCTGCTGGCCGAGGGCCTCGGCCGAGCCTG 60
METLeuProPheGlyLeuValAlaAlaLeuLeuLeuAlaAlaGlyProArgProSerLeu

GGCGACGAAGCCATCCACTGCCCCCTTGCTCCGAGGAGAAGCTGGCGCGCTGCCGCC 120
GlyAspGluAlaIleHisCysProProCysSerGluGluLysLeuAlaArgCysArgPro

CCCGTGGGTGCGAGGAGTTGGTGC GGAGCCAGGCTGCGGTTGTTGCCCACTTGCGCC 180
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TyrProProArgGlyValGluLysProLeuArgThrLeuMetHisGlyGlnGlyValCys

ACGGAGCTGTCCGAAATCGAAGCCATCCAGGAAAGCCTGCAGACCTCTGACAAGGATGAG 360
ThrGluLysSerGluIleGluAlaIleGlnSerLeuGlnThrSerAspLysAspGluGlu

AGCGAACATCCCAACAACAGCTTCAACCCCTGCAGTGGCCATGATCACAGGTGCCTCGAG 420
SerGluHisProAsnAsnSerPheAsnProCysSerAlaHisAspHisArgCysLeuGln
*

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LysHisMetAlaLysIleArgAspArgSerLysMetLysIleValGlyThrProArgGlu

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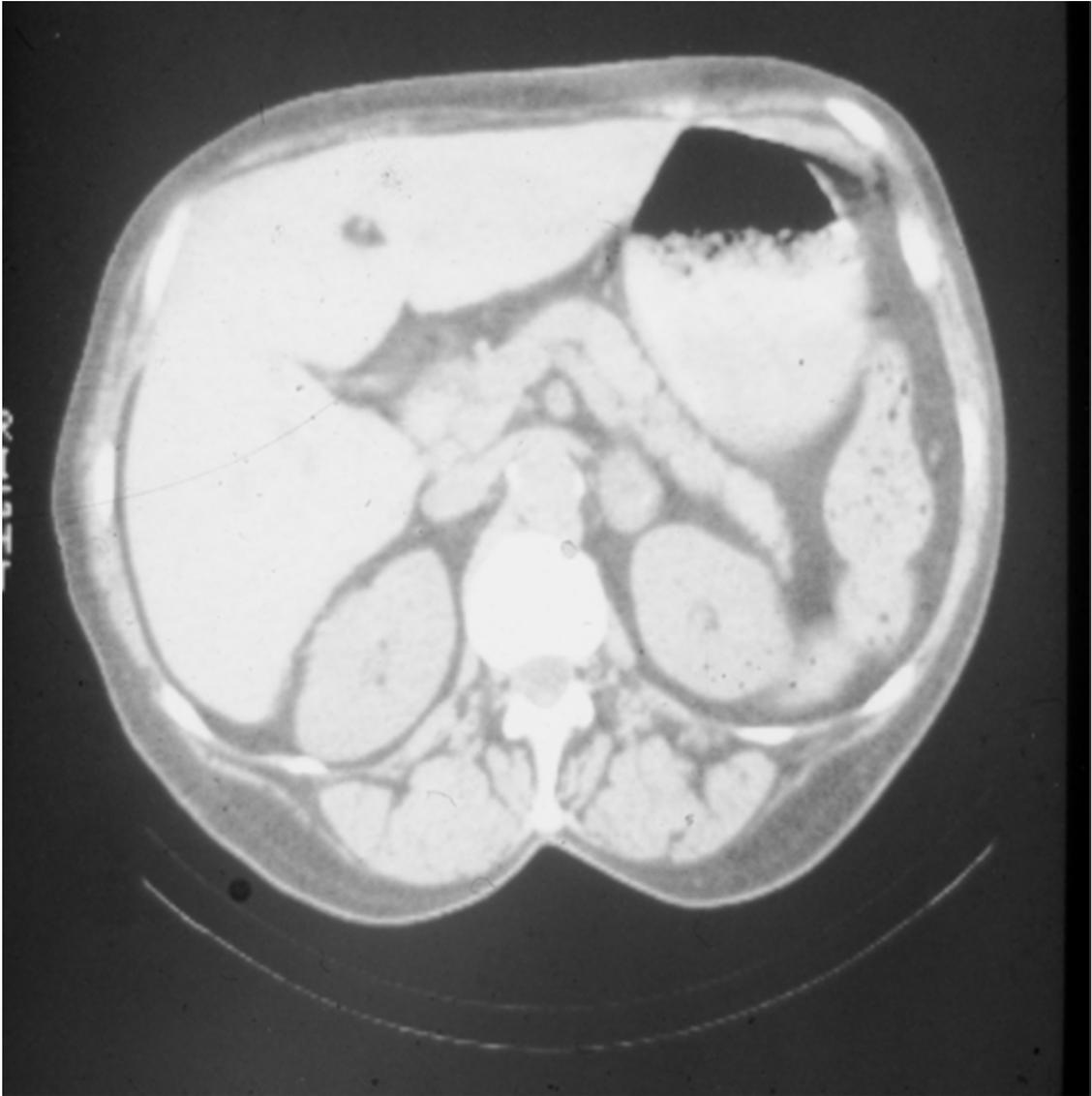
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GlyGluLeuAspCysHisGlnLeuAlaAspSerPheGlnGluEnd

GGGGGACTCAGTCCCCCTACTAGGCCCTATGCTCTGGGGTTTGTAGAGTTGACCTGG 840

CTTGGAGTCTGAGTCCTGGCT 861

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Fig. 2. Deduced nucleic acid sequence and amino acid sequence of mouse IGFBP-4.
* = potential glycosylation site.





The New England Journal of Medicine

10 SHATTUCK STREET, BOSTON, MASSACHUSETTS 02115-6094 - TELEPHONE 617/734-9800

EDITORIAL OFFICES

89-2986

December 19, 1989

Nathan S. Ross, M.D.
Medical Service 151(w)
Dept. of Veterans Affairs
Medical Center
10701 East Blvd.
Cleveland, OH 44106

Dear Dr. Ross:

I am sorry to say that we will be unable to use your manuscript, "A Re-Evaluation of Hormonal Screening for the Incidentally Discovered Adrenal Mass." Both reviewers and I thought that your manuscript addressed an interesting and important issue, and I think we all tend to agree with you that exhaustive investigation of patients with seemingly asymptomatic adrenal masses is not warranted. However, as pointed out by the reviewers, the manuscript has a number of limitations that make the results difficult to evaluate and understand, not least of which is the limited prevalence data available for some of the disorders being considered. Finally, one is left wondering just what ought to be done to evaluate such patients.

Thank you for your interest in the Journal.

Sincerely yours,

Robert D. Utiger, M.D.
Deputy Editor

RDU/drg
Enclosures

REVIEW ARTICLE

CURRENT CONCEPTS

JANE F. DESFORGES, M.D., *Editor*

HORMONAL EVALUATION OF THE PATIENT WITH AN INCIDENTALLY DISCOVERED ADRENAL MASS

NATHAN S. ROSS, M.D., AND DAVID C. ARON, M.D.

THE finding of an adrenal mass in the course of abdominal computerized tomography (CT) performed for other reasons poses an increasingly common clinical problem. The prevalence of such incidentally recognized masses ranges from 0.6 to 1.3 percent.¹⁻³ An autopsy study performed in conjunction with one study of CT scans revealed a 1.9 percent

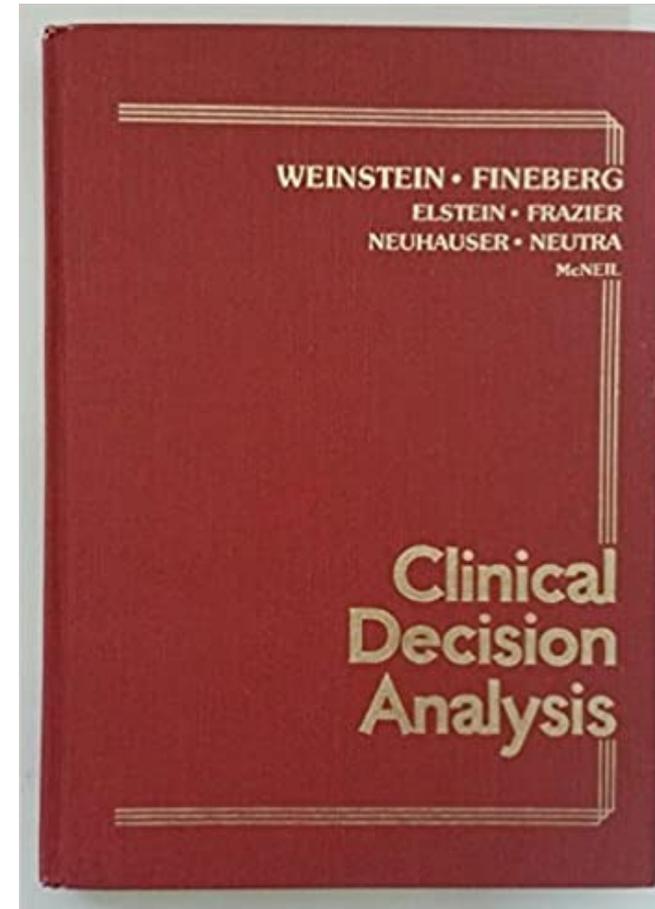
From the Endocrinology Section, Veterans Affairs Medical Center, West Los Angeles, and the School of Medicine, University of California, Los Angeles (N.S.R.), and the Endocrinology Section, Veterans Affairs Medical Center, and the Division of Endocrinology and Hypertension, Department of Medicine, Case Western Reserve University School of Medicine, Cleveland (D.C.A.). Address reprint requests to Dr. Ross at the Endocrinology Section, W111D, W. Los Angeles Veterans Affairs Medical Center, Sawtelle and Wilshire Blvds., Los Angeles, CA 90073.

Supported in part by the Medical Research Service of the Department of Veterans Affairs and by grants (HD25299 and DK41527) from the Public Health Service.

prevalence of cortical adenoma in patients for whom no evidence of endocrinopathy was recorded during life.² In addition, a single pheochromocytoma was found (prevalence, 0.1 percent). Another autopsy study found an 8.7 percent prevalence of adrenocortical adenoma.⁴ These data suggest that as scanning techniques continue to improve, an adrenal mass will be discovered incidentally in at least 2 percent of patients undergoing abdominal CT scanning for an unrelated reason.

The optimal evaluation and treatment of patients with such lesions are controversial.¹⁻¹³ There are algorithms for the evaluation of patients thought to have hormonally active adrenal lesions, such as pheochromocytomas or functioning adrenal carcinomas or adenomas, that produce an excess of glucocorticoids, mineralocorticoids, or sex steroids. Additional diagnostic possibilities, such as simple adrenal cysts, myelolipomas, and adrenal hemorrhages, can usually be identified by their CT characteristics alone,¹⁴ and patients with these conditions do not require evaluation to detect hormonal hyperfunction. Carcinoma that has metastasized to the adrenal gland, although an important diagnostic consideration, cannot be readily diagnosed with noninvasive techniques. The large number and widespread availability of hormone assays and the desire of many physicians to exclude with certainty the diagnosis of a hormone-secreting tumor have led to various approaches to biochemical screening. For example, a recent textbook of endocrinology

Reprinted from the *New England Journal of Medicine*
323:1401-1405 (November 15), 1990



On to a new job.



Aucott JN, Pelecanos E, Bailey AJ, Shupe TC, Romeo JH, Ravdin JI, Aron DC. Interdisciplinary integration for quality improvement: the Cleveland veterans affairs medical center firm system. The Joint Commission journal on quality improvement. 1995 Apr 1;21(4):179-90.

Batalden, P.B., and Stoltz, P.K. A framework for the continual improvement of health care: building and applying professional and improvement knowledge to test changes in daily work. *Joint Commission Journal on Quality Improvement*; 19 (10):424-447, Oct. 1993



April 23, 1998

David P. Stevens, MD

Chief Academic Affiliations Officer (14)

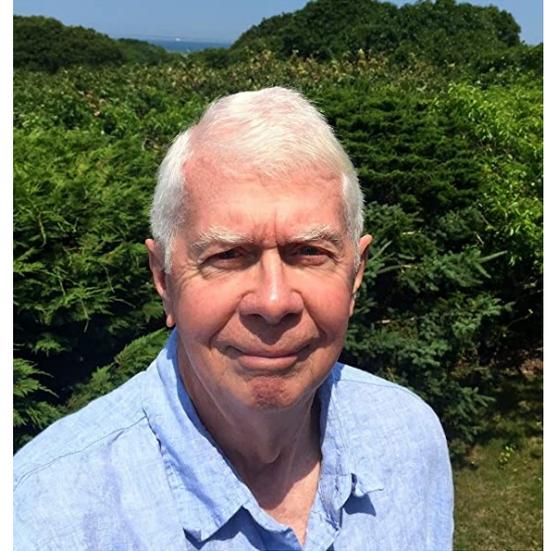
VA Headquarters

810 Vermont Avenue, NW

Washington, DC 20420

Dear Dr. Stevens:

It is with great pleasure that I apply for the position of Senior Quality Scholar. I am enthusiastic about serving as the Fellowship Program Director and a mentor in a unique network-based program...

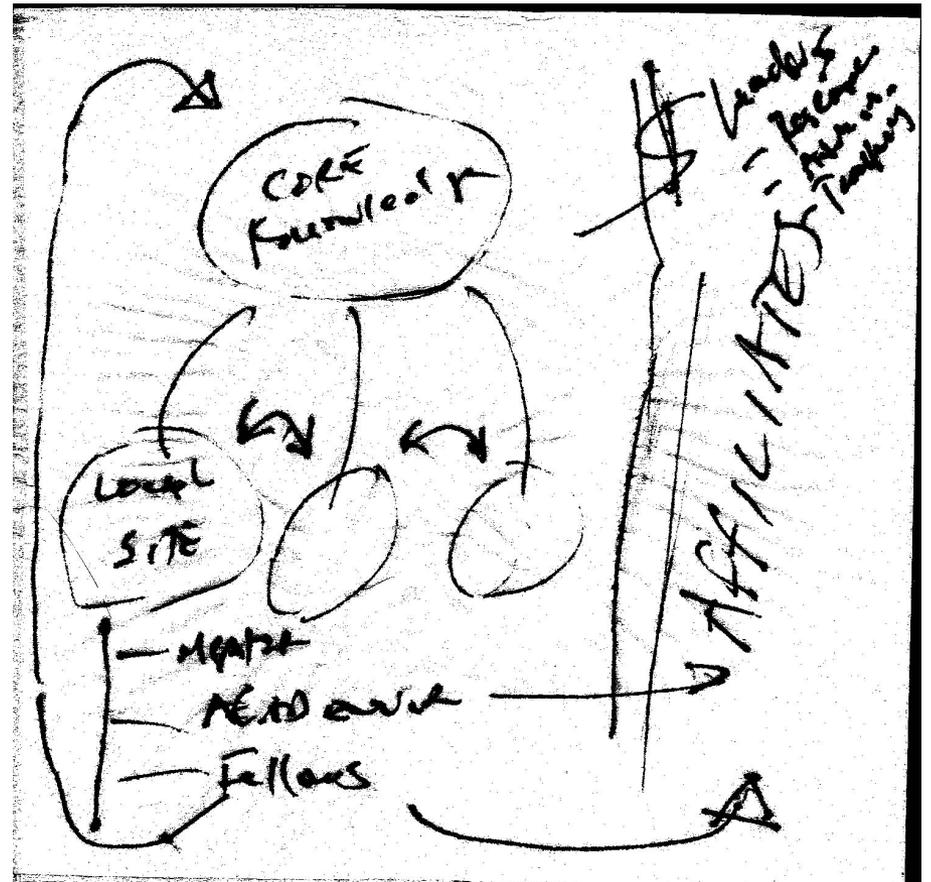


Ohio VA NQSFP: Scientific Advisory Committee

D. Neuhauser, PhD	Professor (Dept. of Epi/Biostat, etc.) CWRU
R. Ludke, PhD	Dir., Ctr. For Health Systems Res., IHPHSR-UC
S. Ghosn, MD	Chief, Path. & Lab. Medicine, Cincinnati VAMC and Prof., UC
L. Headrick, MD	Assoc. Professor (Medicine), CWRU
S. Moore, RN, PhD	Assoc. Professor, CWRU School of Nursing
A. Rimm, PhD	Chair (Dept. of Epi/Biostat), CWRU
J. Tsevat, MD, MPH	Dir., Ctr. for Clinical Effectiveness, IHPHSR-UC

Plan of the VA Quality Scholars Program as conceived by David Stevens, Paul Batalden and David Leach in the Old Ebbitt Grill and (of course) drawn on a napkin.

Innovative Curriculum in Quality Improvement coordinated by the Center for the Evaluative Clinical Sciences at Dartmouth Medical School. The curriculum covers research and clinical training in quality improvement, health care measurement and systems theory



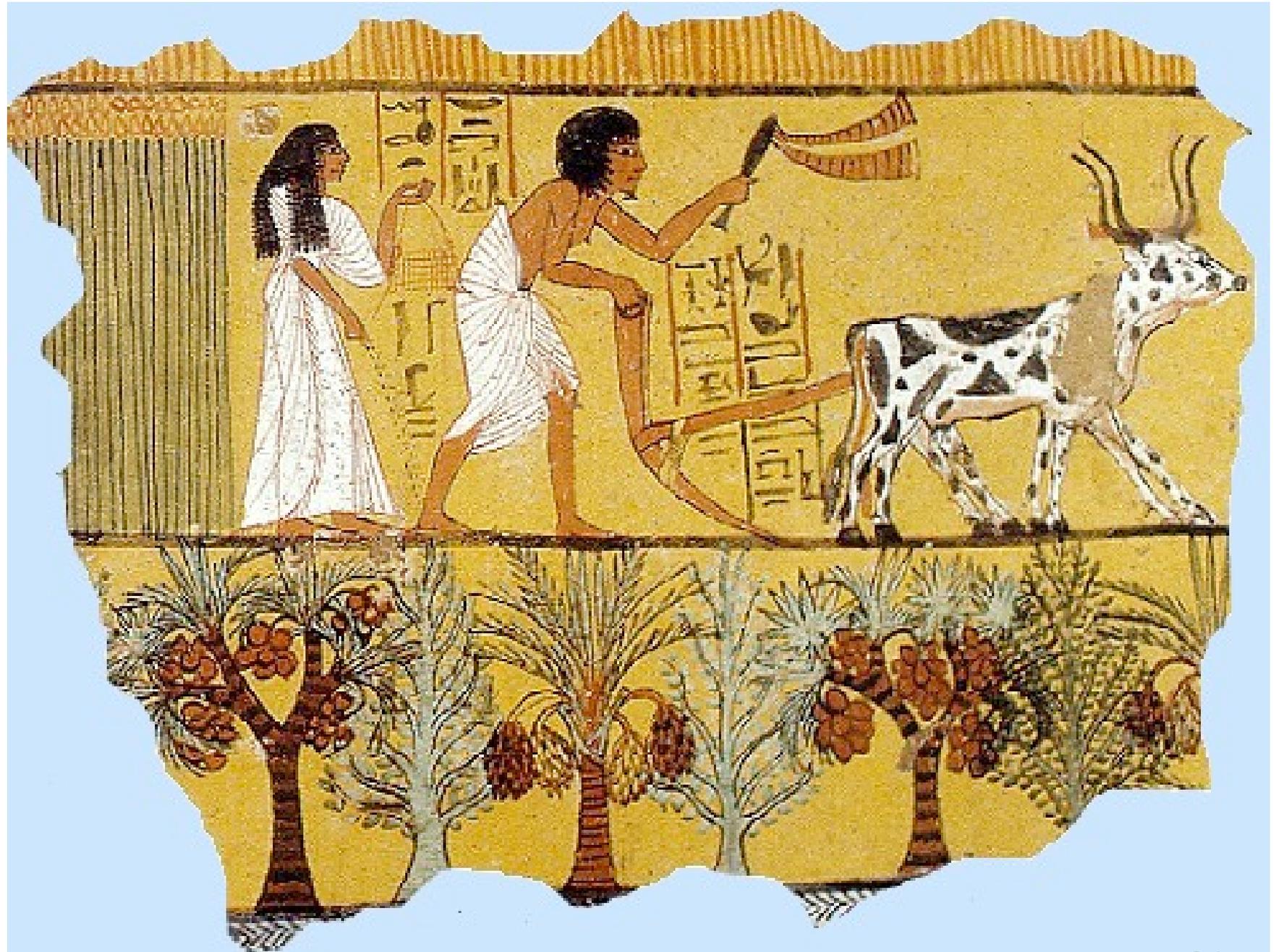
The rest, as they say, is history.

Improving quality and safety is not easy and we have made far less progress than most of us had hoped.

Why is it so difficult?

“If things were simple, word would have gotten around.” — (Jacques Derrida)

Those of us who have toiled in the field of health care delivery and its improvement have had a tough row to hoe – rocky soil, tools not fit for purpose, pests, and a changing climate.



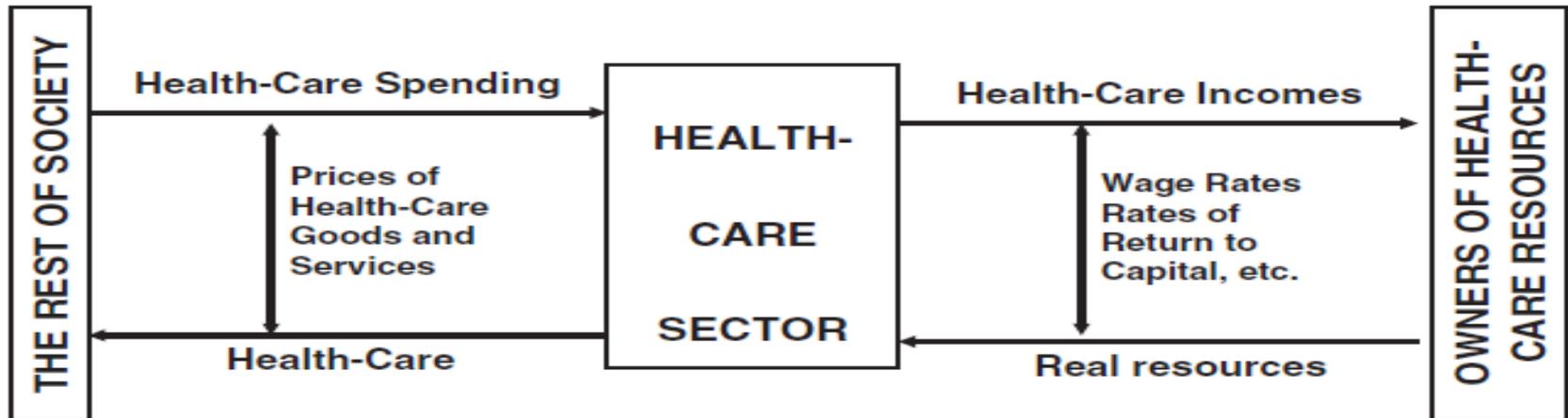


<https://visibleearth.nasa.gov/images/64868/egypt>

We can't agree what crop to grow

The Health Care & Health Facet

The Income--Employment Facet



OBJECTIVE A:

Enhancing the patients' quality of life

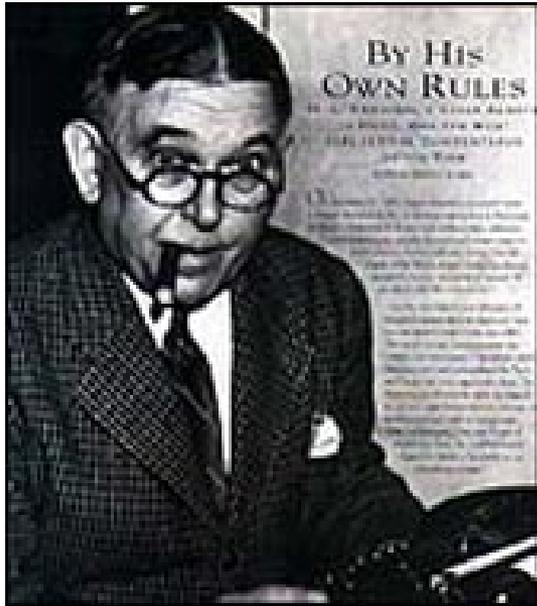
OBJECTIVE B:

Enhancing the "providers" quality of life

Reinhardt U. Divide et impera: protecting the growth o health care incomes (costs) . Health Econ 2012;21:41-54.

“Remember that what the rest of us call health care costs, they call income.”

Paul Krugman, *NYTimes* 5/10/09



“When you hear someone say, ‘this is not about money’, it’s about money.”

—H.L. Mencken

Even if it is the right crop (i.e., health care), we are not sure how to do it.

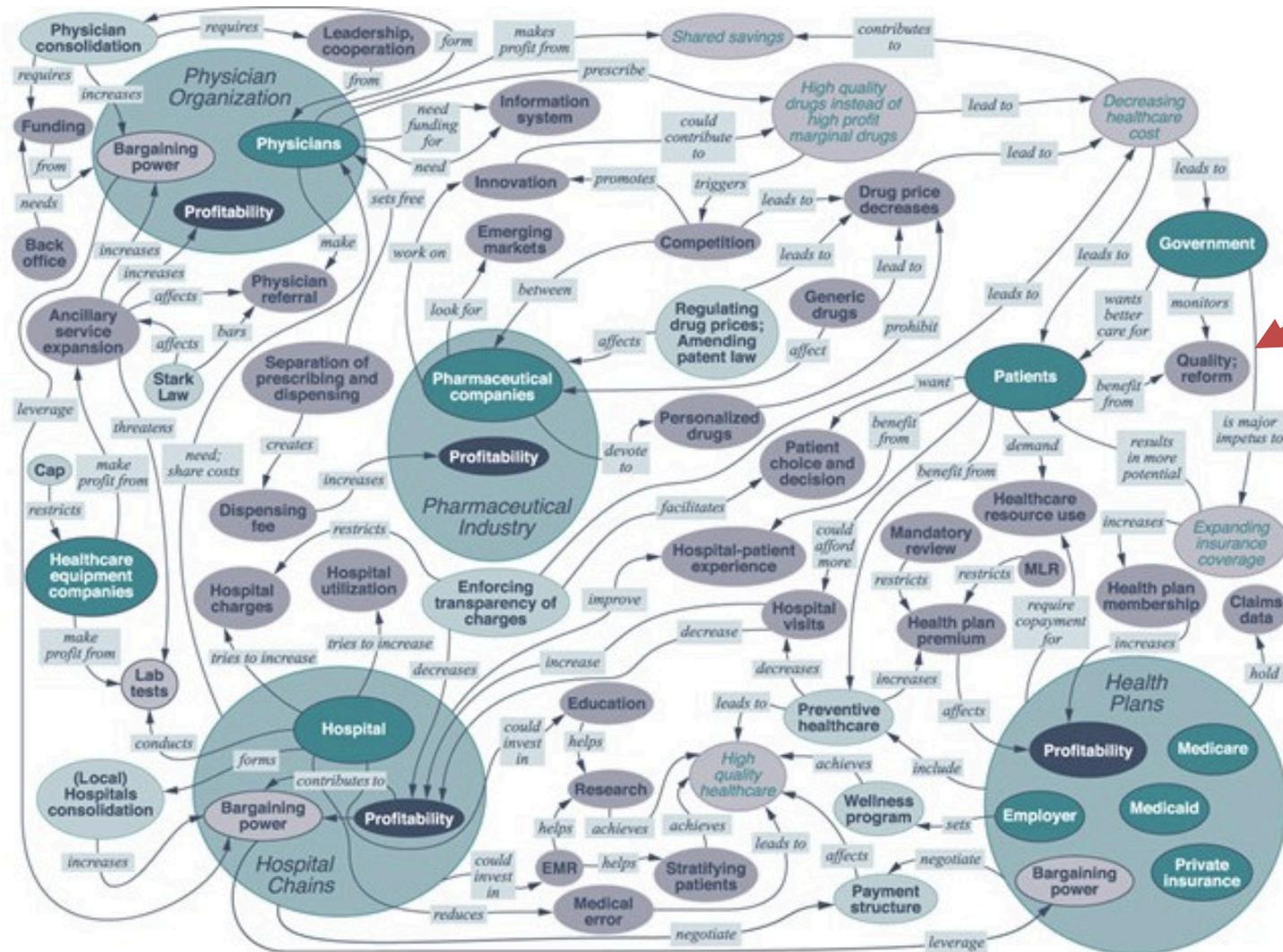
- Goal: Good care for all versus not quite as good for most, but great for a few.
- Means: Primary care vs specialty care

Success depends first, on soil quality

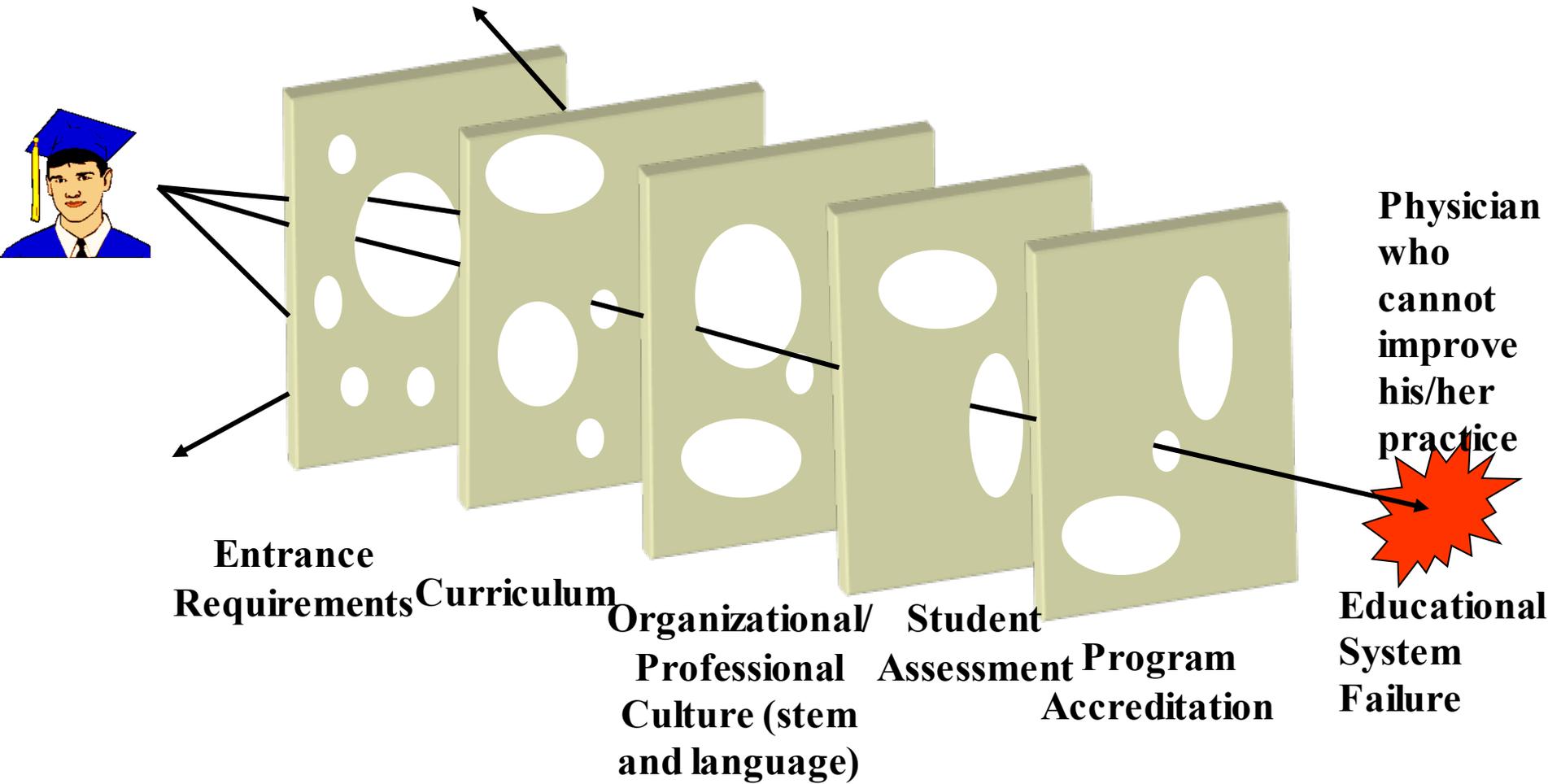
- the capacity of a soil to function for specific land uses or within ecosystem boundaries. This capacity is an inherent characteristic of a soil and varies from soil to soil.

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/rca/?cid=nrcs143_014198

Ecosystem



- **Medical school faculty need to take the lead in improving healthcare and ensuring patient safety, but they don't**



The curriculum is a small problem; the ethos of the research university is a big problem.

The Ethos of the University:

Valuing discovery of new knowledge over all else

Valuing the “hard” sciences over “softer” social sciences.

- "...Prestige was least for studies of therapeutic interventions in patient care, and rose as the research went to explication of organ-system pathophysiology, to physiology, and eventually to molecular mechanisms of biology. Being inversely proportional to the structural size of the object under investigation, prestige increased as the investigated material became smaller, from intact organism, to organ, and eventually to infracellular..." Alvin Feinstein

P&S The College of Physicians & Surgeons of Columbia University

Vol. 25 No. 2 Spring/Summer 2005

Teaching Academies: Putting the School back in Medical School

Spring/Summer 2005 HOME CONTENTS CONTACT US BACK ISSUES

Teaching Academies:

Putting the *School* Back in Medical School



What a

concept!

(and only 30 years after I graduated from this school)



Rocky soil

- How we are organized
 - Departmental/Unidisciplinary
 - How we are regulated

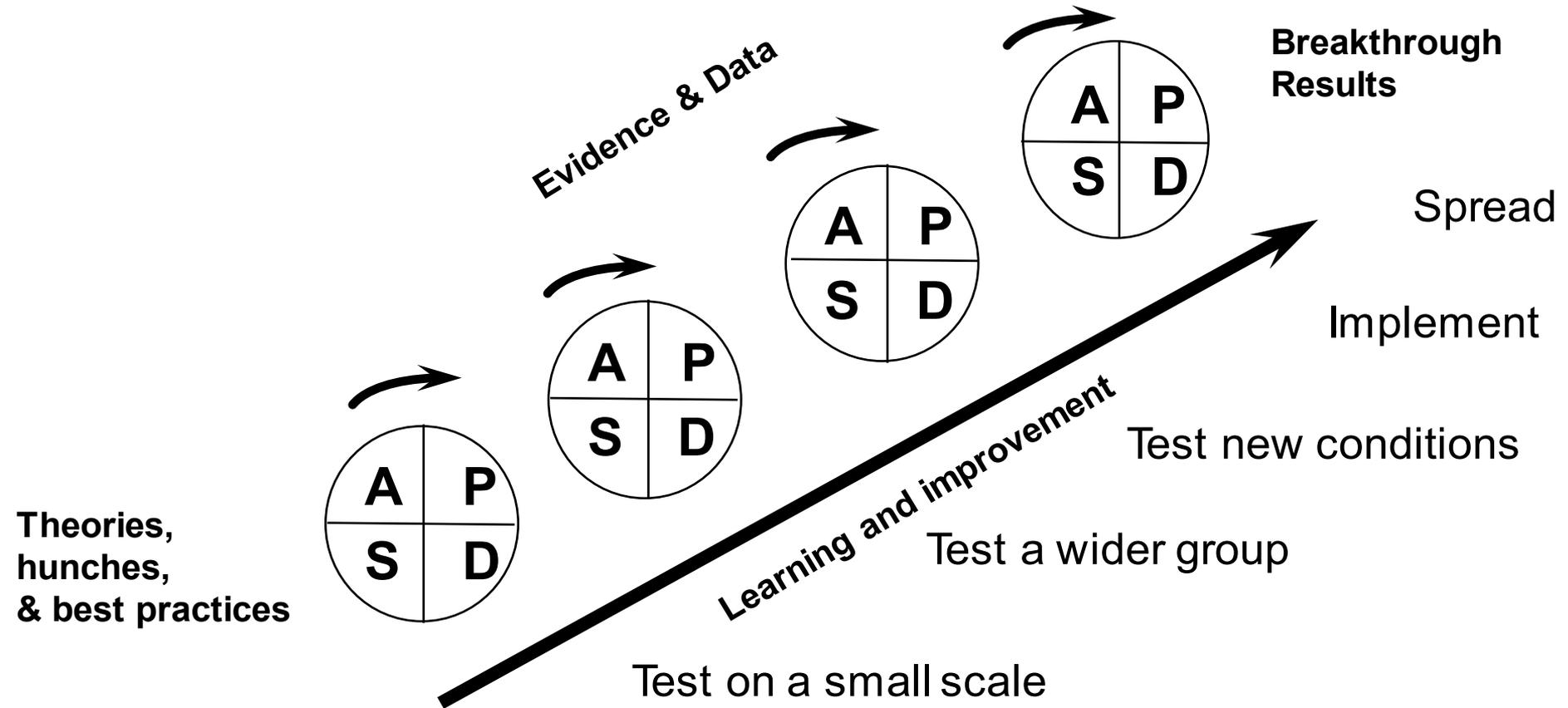




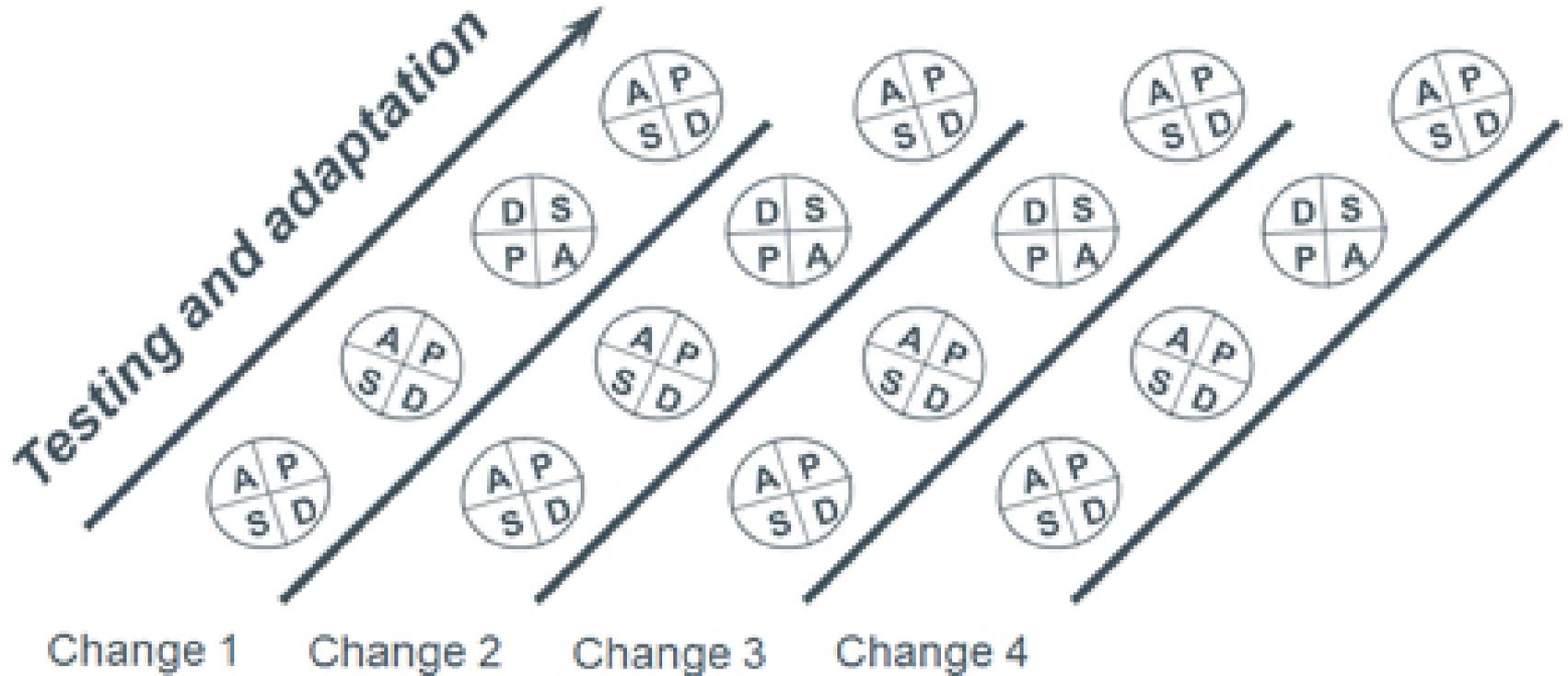
Tools not fit for purpose.

- Directly taken from manufacturing and aviation without taking into account that healthcare is neither manufacturing nor aviation.
 - PDSA, six sigma, lean (add to that, inadequate time to use these tools effectively)
 - Targets aka Performance measures (Goodhart's law)
- Tools don't always fit into the workflow; workflow can't always adapt to the tools without unintended consequences.
 - EMR, i.e. billing systems

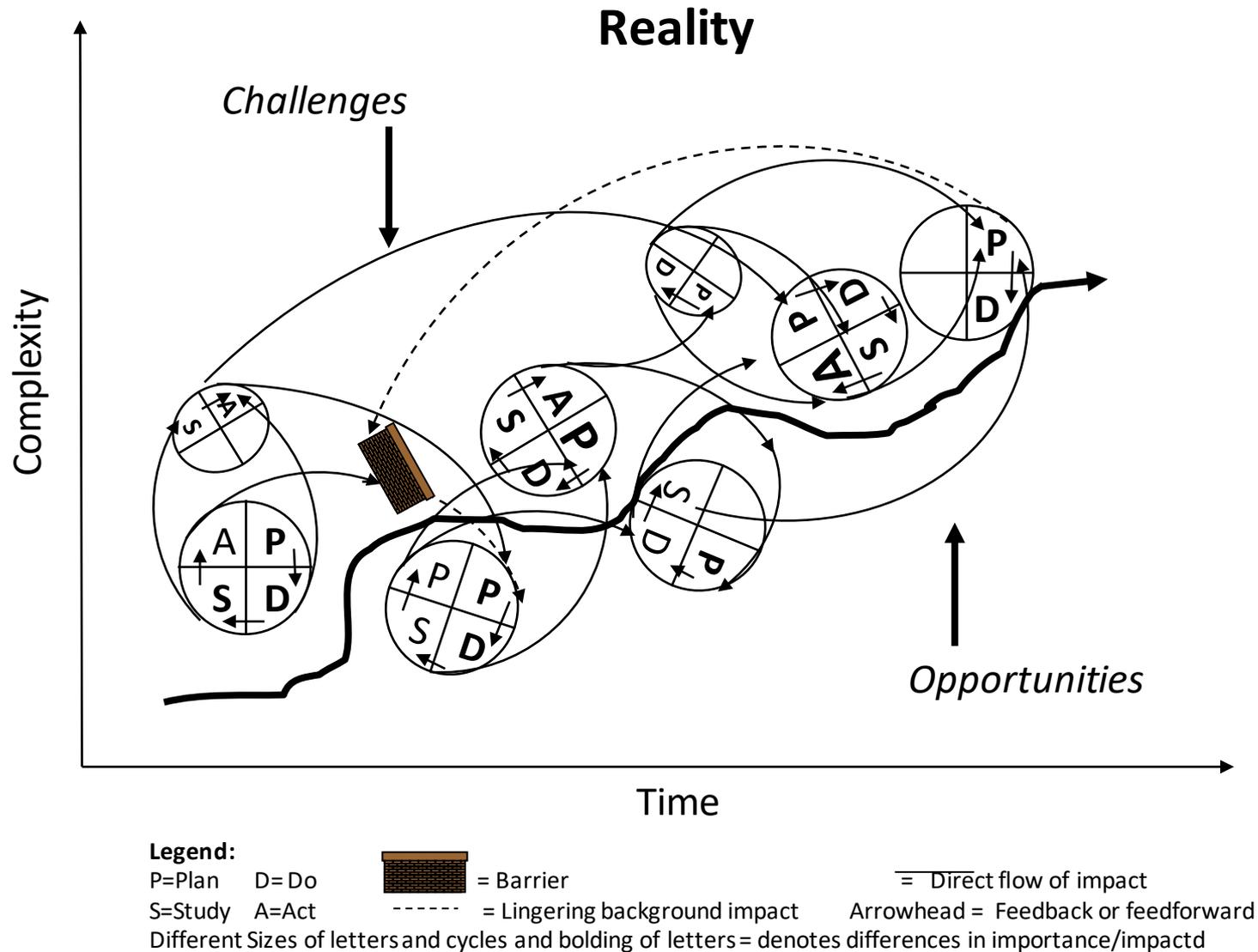
Model for Improvement sequential testing



Simultaneous Ramps



<http://www.ihl.org/resources/Pages/HowtoImprove/ScienceofImprovementTestingMultipleChanges.aspx>

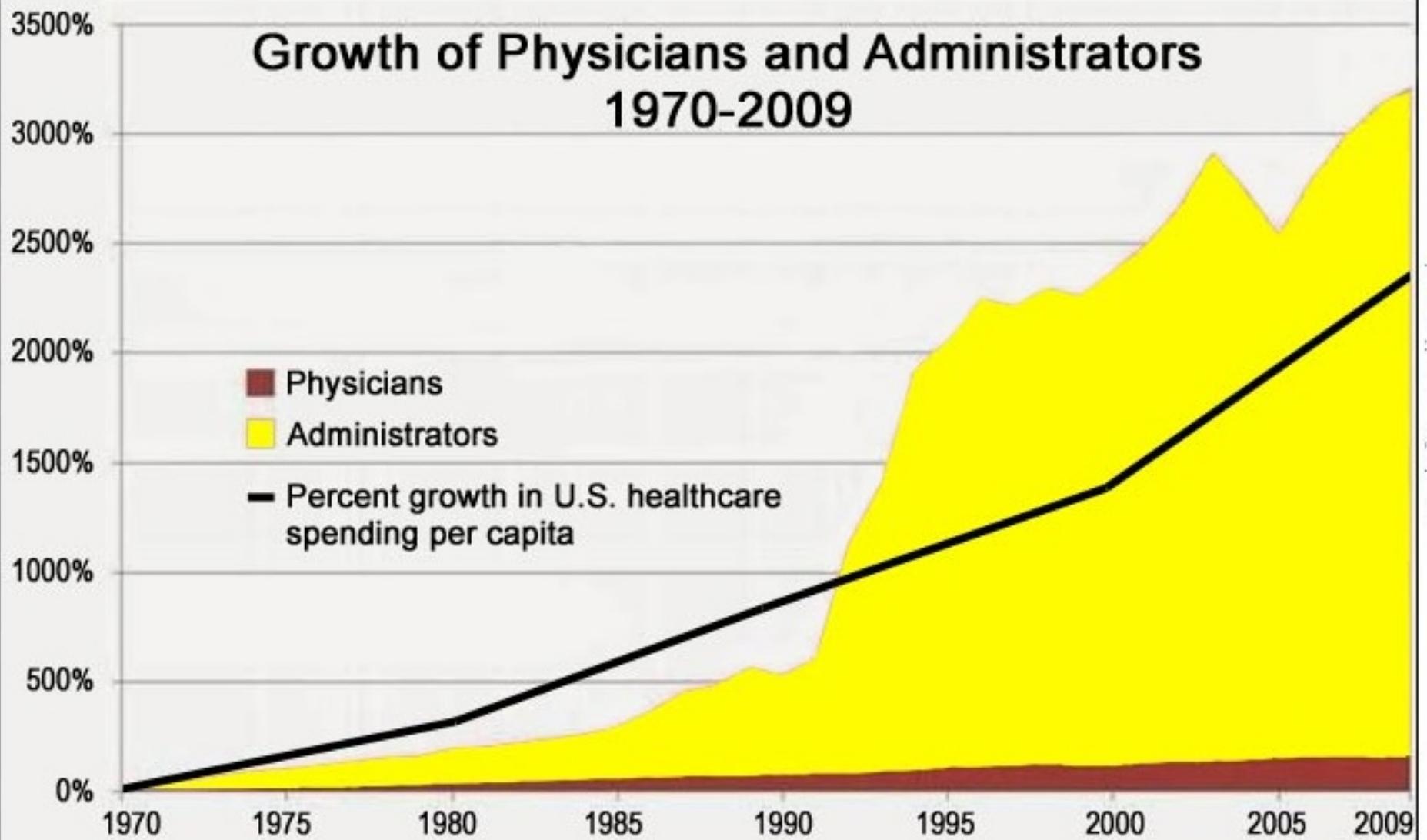


Tomolo AM, Lawrence RH, Watts B, Augustine S, Aron DC, Singh MK..
 Journal of graduate medical education. 2011 Mar;3(1):49-58.

Pests

- Those that consume the crops or inhibit their growth
- Those that are just annoying.

Growth of Physicians and Administrators 1970-2009



Source: Bureau of Labor Statistics; NCHS; and Himmelstein/Woolhandler analysis of CPS

Improvement Brands and Consultants



CONSULTING

IF YOU'RE NOT A PART OF THE SOLUTION,
THERE'S GOOD MONEY TO BE MADE IN PROLONGING THE PROBLEM.

10 March 2021



Special Report:

"Who cares for those who care for us?"



MODERN SOCIETY INITIATIVE

@msiuk_

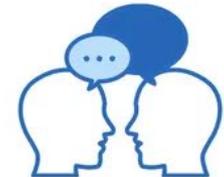
'Low hanging fruit' to improve NHS morale:

MSI analysed a list from over 1000 healthcare workers on social media:

Free parking



More lockers



Dedicated staff communication

Free quality coffee



Uniform washing service



Hot food 24/7



Provision of staff rooms

<https://modernsocietyinitiative.org/latest-research/f/msi-special-report-who-care-for-those-who-care-for-us>

Health Care Quality Improvement: Where are the Health Services Researchers?

- The health care “quality problem” is widely recognized, generally accepted and (reasonably) well-understood
- The problem is also the focus of considerable effort
- Yet effective “evidence-based” solutions (and success) remain elusive

Health Services Researchers

Why Have We Failed?

- A common answer:

- We lack sufficient evidence and knowledge regarding effective quality improvement (practice change) strategies (intervention/problem matching, effect modifiers, etc.)

- An alternative answer:

- We have the knowledge, but lack the will and/or ability to act on that knowledge
- We fail to act on the evidence and advice we receive (and produce)
 - we repeatedly initiate new efforts without attending to barriers, or including elements, previously found to be important
 - **we discount evidence and advice that fail to have universal, total effectiveness**
- **We continue to seek--and believe in—(non-existent) simple solutions (“the answer”)**

The Implementation Gap

**It is one thing to say with the prophet Amos,
“Let justice roll down like mighty waters,”
and quite another to work out the irrigation
system.**

~ Rev. William Sloane Coffin

But *let justice* well up as waters, and righteousness as a mighty stream. Amos 5:24, JPS



RESEARCH ACTIVITIES

U.S. Department of Health and Human Services • No. 356, April 2010

Highlights

Departments

Patient Safety and Quality . . . 2

Women's Health 6

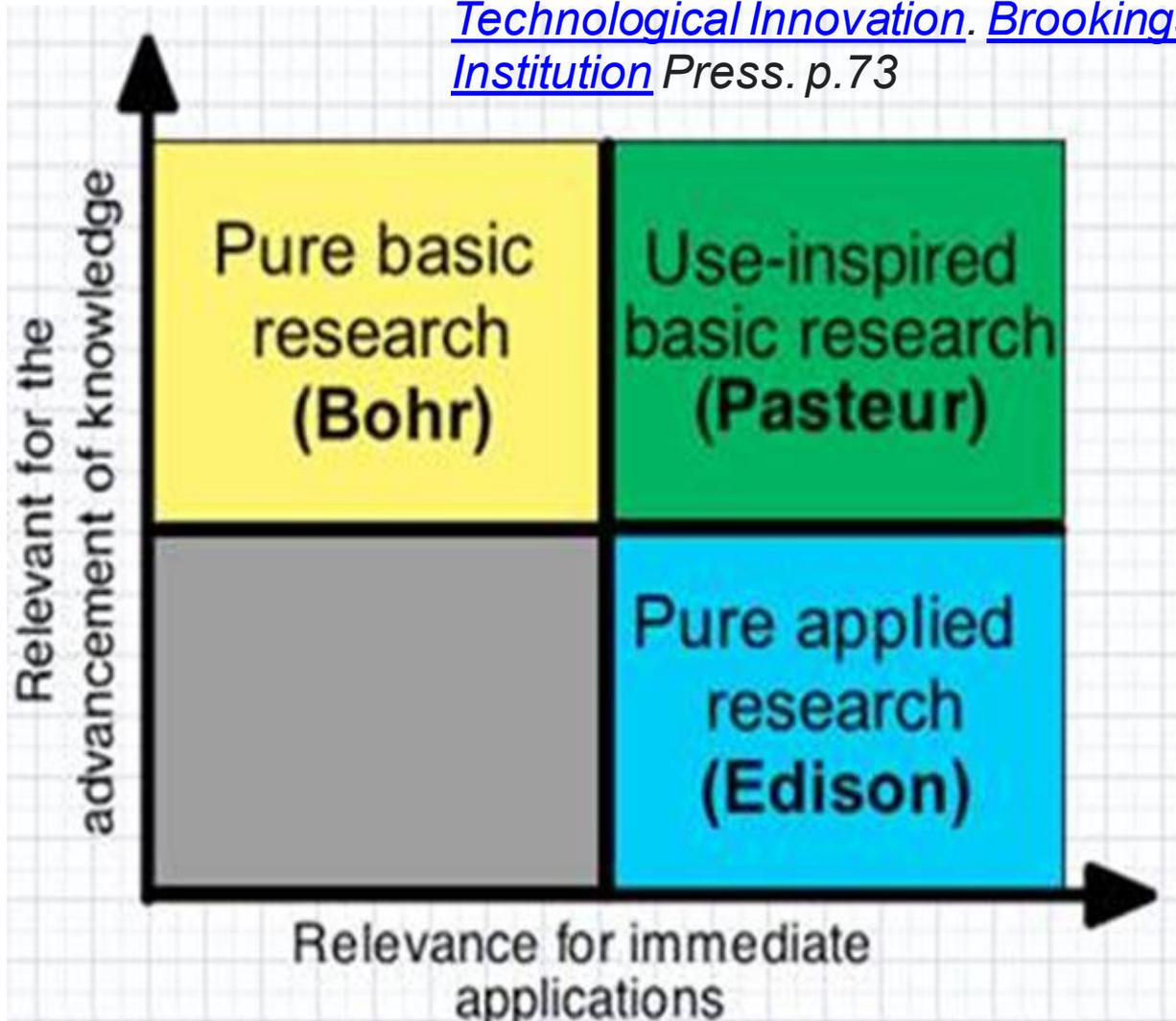
Child/Adolescent Health 8

Patients admitted to the hospital on weekends wait for major procedures

Of the 8 million patients who were admitted to U.S. hospitals on weekends in 2007, approximately one-third received needed major procedures on the day of admission, according

had a major cardiac procedure such as angioplasty or heart bypass surgery performed by the second day of their hospitalization compared with 76 percent of heart attack patients

Stokes, Donald E. (1997). [Pasteur's Quadrant – Basic Science and Technological Innovation](#). [Brookings Institution Press](#). p.73

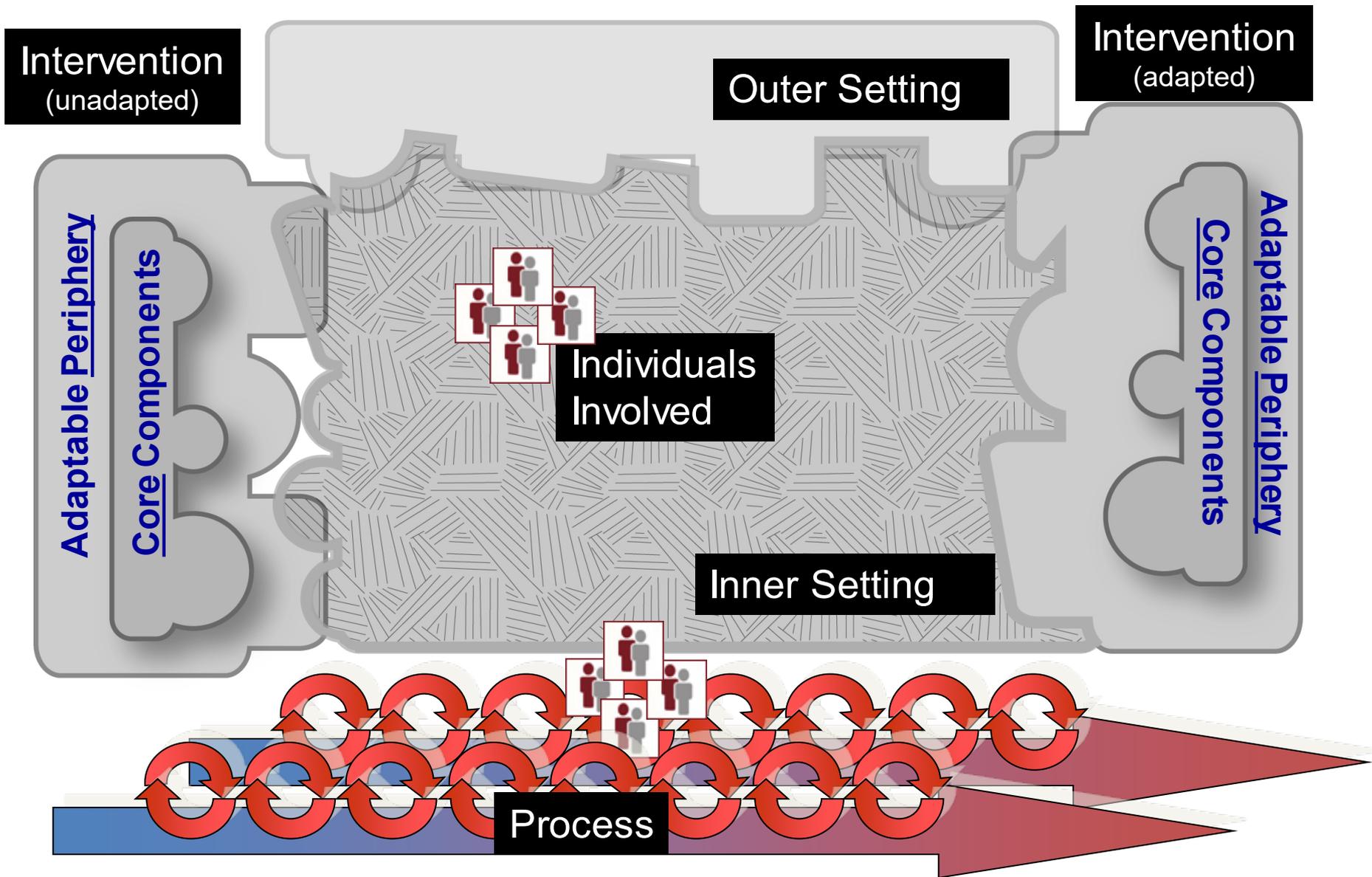


Revisiting Pasteur's Quadrant: Use-Inspired Basic Research ☐ NIH conference October 9-10, 2012

Implementation Science is following the same failing path:
Multiplicity of theories, frameworks, and models of
implementation

- **Tabak 2012** - reviewed 61 models and classified based on construct flexibility, D vs I, and sociological levels.
- **Moulin 2015** – reviewed 49 and classified by several different factors (type of framework, stages addressed, element characteristics)
- **Nilsen 2015** – didn't bother to count them; classified several different ways
- **New ones being generated along with new terms**
- **Where is the empirical support for their use or benefits?**

Consolidated Framework for Implementation Research (CFIR)

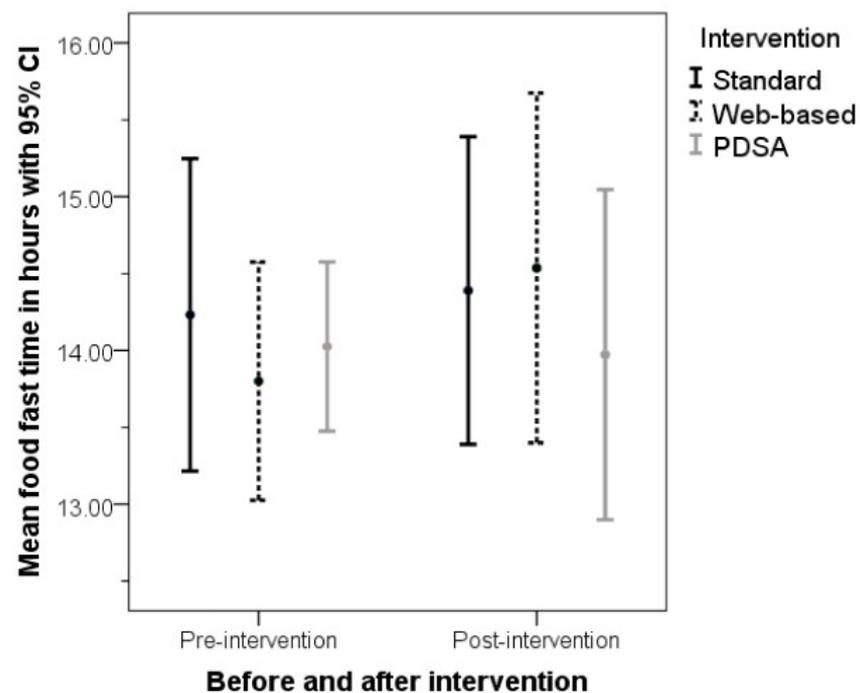
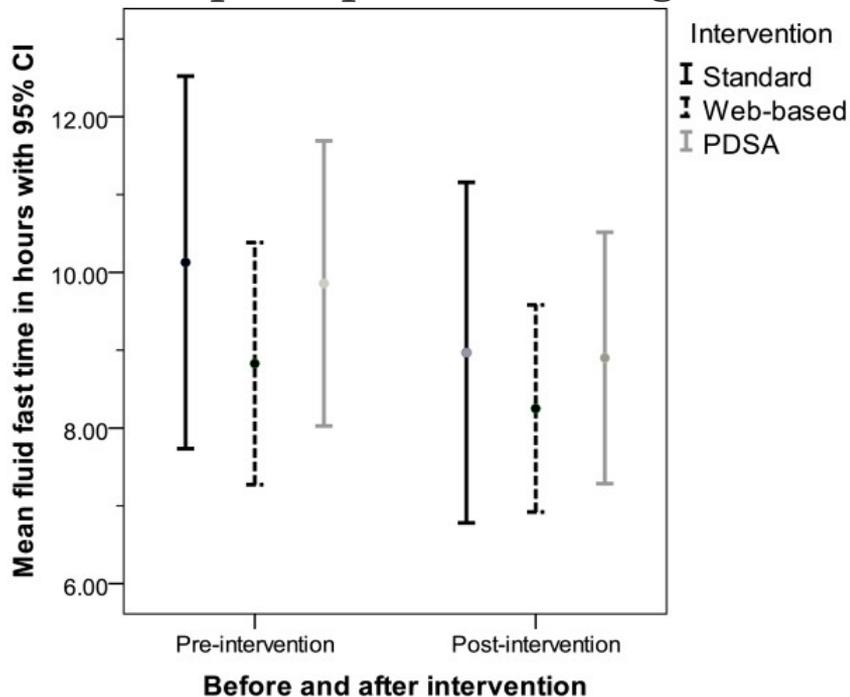


Impl Sci is following the same path as HSR

- **The nature of the scientific knowledge “discovered”***
 - **It is important to have a vision (see Proverbs 29:18)**
 - **Leadership is important (see Exodus)**
 - **Primary care/mental health integration is more likely to occur when there is ‘spatial sufficiency.’ (see etymology of)**

***Each of these was a finding in a paper published in a high impact HSR journal.**

Good quality evidence has been summarised into guideline recommendations to show that peri-operative fasting times could be considerably shorter than patients currently experience. The objective of this trial was to evaluate the effectiveness of three strategies for the implementation of recommendations about peri-operative fasting.



Rycroft-Malone et al. A pragmatic cluster randomised trial evaluation three implementation interventions. *Implementation Science*. 2012;7:80

Conclusions

This was a large, complex study and one of the first national randomised controlled trials conducted within acute care in implementation research. The evidence base for fasting practice was accepted by those participating in this study and the messages from it simple; however, implementation and practical challenges influenced the interventions' impact. A set of conditions for implementation emerges from the findings of this study, which are presented as theoretically transferable propositions that have international relevance. (my underlining-dca)

There are a set of conditions and antecedents for implementation that emerge from the findings of this study, which we have developed into a number of propositions:

- 1. Implementation is more likely to be successful in cases where the topic/issue is a strategic and organisational priority...
- 2. A historical lack of clear leadership, structure, and process for local guideline dissemination and implementation, in which staff are unclear about their responsibilities, will negatively impact on an organisation's ability to routinely use guideline recommendations.
- 3. Robust and believable evidence is not always sufficient to change decision making and practice, therefore implementation interventions and efforts need to extend beyond individual decision making (at least for certain clinical topics) and take account of the systemic inter-connections between individuals, teams and organisations.

- 4. In areas where there is more effective teamwork with clear communication, practice change will be easier to achieve.
- 5. New improvement and implementation projects have a higher chance of success if they are embedded into existing programmes and structures.
- 6. Change agent effectiveness is a function of the protected space and dedicated time to fulfil the role, *i.e.*, it has to be part of the 'day job.'
- 7. Change agents will be more effective if they have people management skills, work collaboratively, handle difficult situations and people with diplomacy, understand where people 'are coming from,' develop and motivate a team, including effective and considerate delegation of work, using team members skills well...

- 8. Evaluations of implementation interventions that capture different types of impacts over the course of the study/programme are more likely to provide a realistic picture of knowledge use, and intended and unintended consequences...
- 9. Complex interventions ...need to be deconstructed to gain a greater understanding of the linkages between the active components/mechanisms of action and the impact on both process and summative outcomes.
- It is likely that these propositions will be theoretically transferable to other implementation studies, particularly when considered alongside the growing empirical and theoretical evidence base about the successful ingredients for successful implementation.

My interpretation:

Although it would have been interesting to have a true control group, no strategy works better than anything else... INDEPENDENT OF CONTEXT.

3 Conceptualizations of the Gap Between Research & Practice

- **Knowledge Transfer Gap: Practitioners need to receive the lessons of research and put them into practice.**
- **Research and practice are entirely separate disciplines and each must develop their own answers to their own problems**
- **Knowledge Production Gap - Research and practice have complementary perspectives and skills that need to be used together to address the real need, collaborative knowledge production.**

At first, blame the intervention.

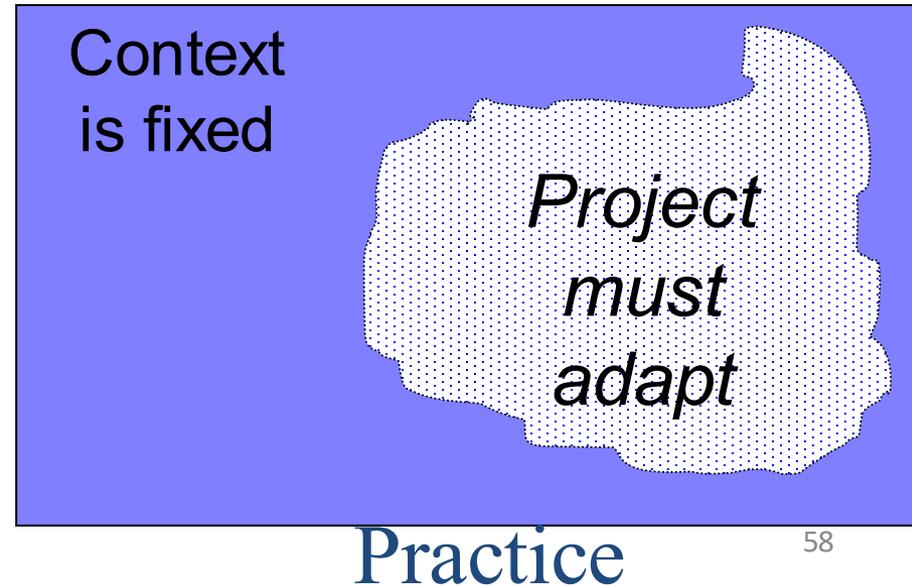
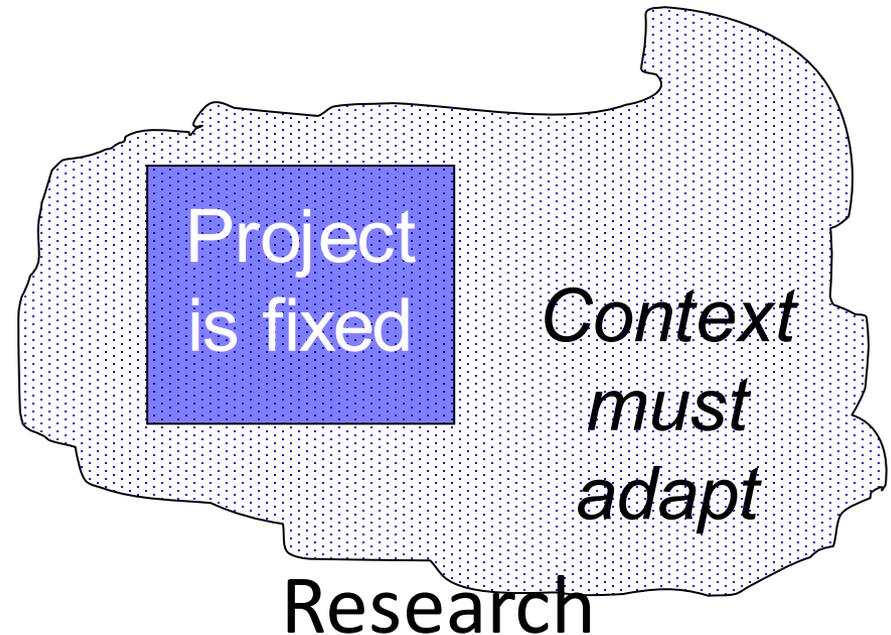
The focus was on what constituted a complex intervention.

- “Complex interventions are ...interventions that are not drugs or surgical procedures, but have many potential “active ingredients... A complex intervention combines different components in a whole that is more than the sum of its parts.” (*Oakley et al. BMJ 2006*)
- Definition modified over time
 - # of interacting components
 - # and difficulty of behaviours required by those delivering or receiving the intervention
 - # of groups or organisational levels targeted by the intervention
 - # and variability of outcomes
 - Degree of flexibility or tailoring of the intervention permitted

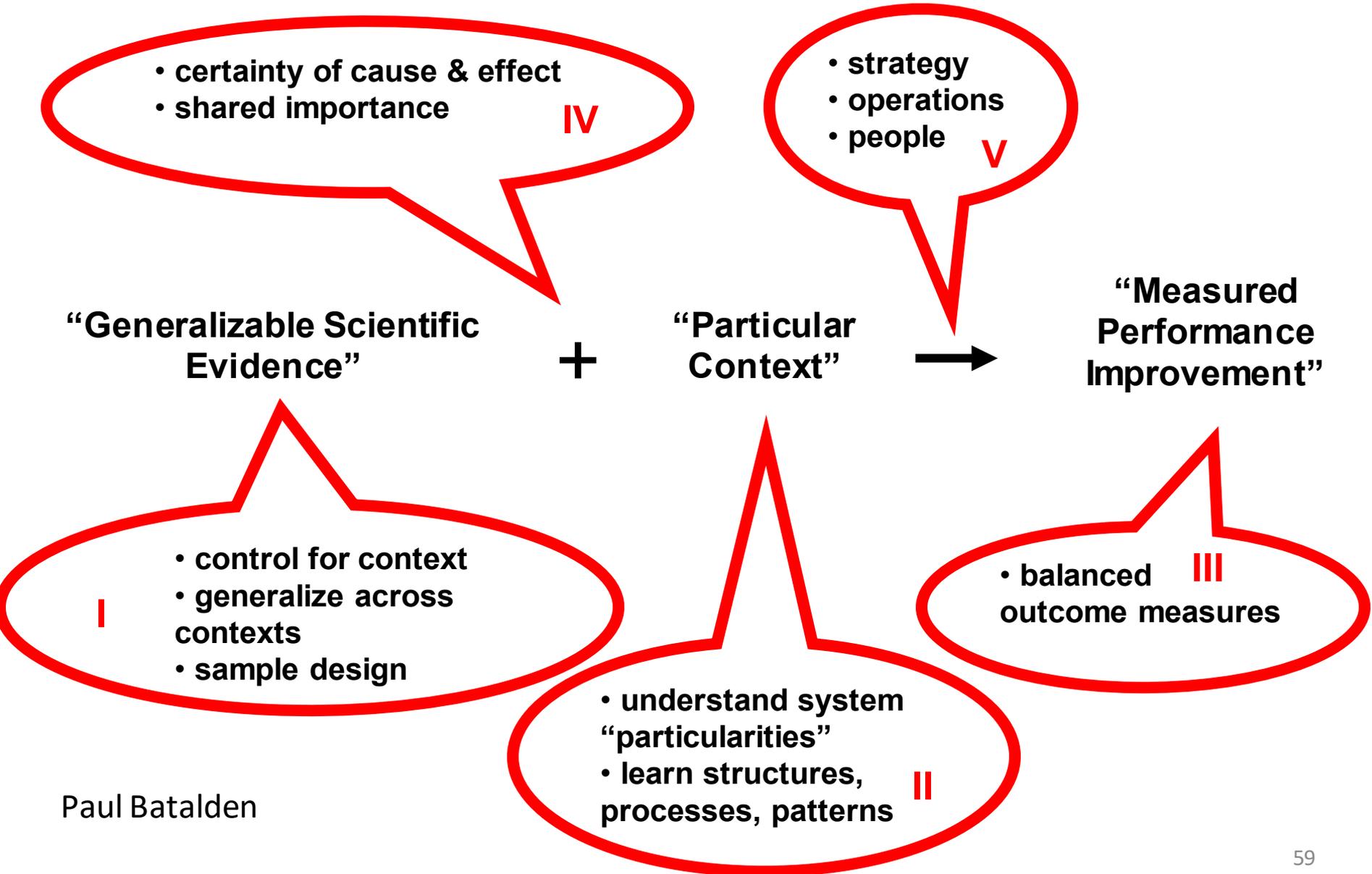
(Craig et al. Br Med J 2008;337:a1655.; the MRC guidance)

Differing World Views

- Rigor vs. relevance
 - Internal vs. external validity
 - Isolation of a phenomenon from context (so that it can be more rigorously studied) when context matters
 - Our methods, theories, world view don't match the problems or apparent solutions
- T. Greenhalgh**



The Work: Science-based Improvement

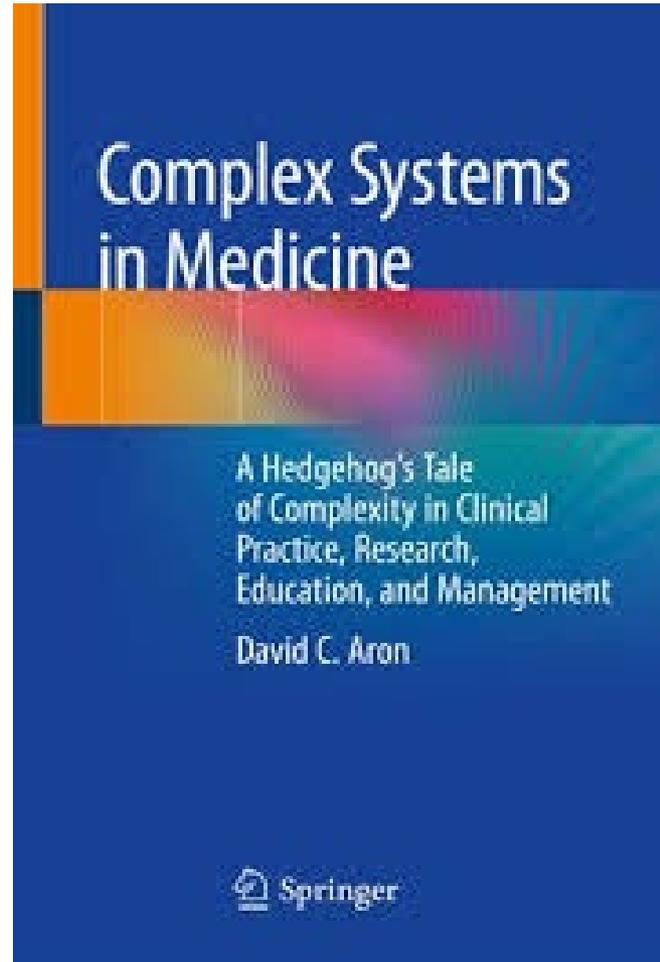


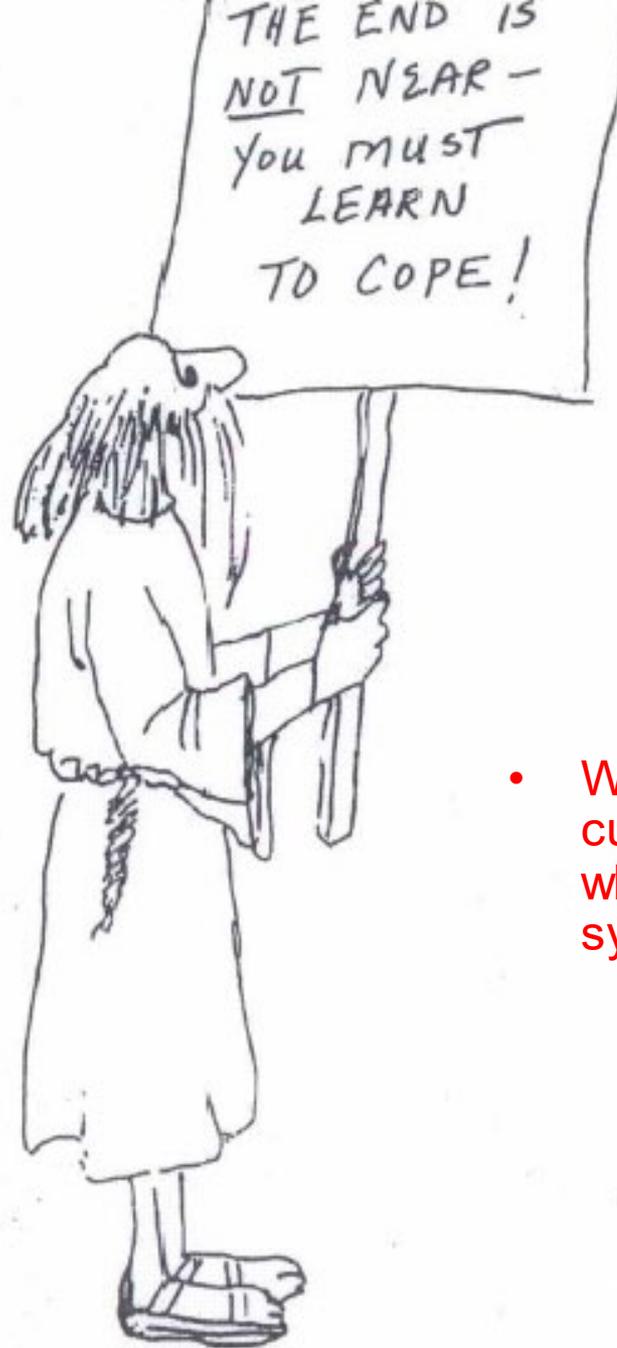
Aron's Heuristics of Implementation and Sustainability

- Implementation = $f(\text{Intervention} \times \text{CONTEXT})$
 - Intervention = Evidence plus Method and Cost of Implementation (although this bears resemblance to the PARIHS model, I place the emphasis on the interaction.)
- Sustainability = $f(\text{CinOteNrvTenEtiXonT})$
 - Sustainability = the degree to which the intervention becomes part of the context - just the way we do business)
 - » Damschroder, L.J., D.C. Aron, R.E. Keith, S.R. Kirsh, J.A. Alexander, and J.C. Lowery. 2009a. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement. Sci* 4:50.
 - » Rycroft-Malone, J., K. Seers, J. Chandler, C.A. Hawkes, N. Crichton, C. Allen, I. Bullock, and L. Strunin. 2013. The role of evidence, context, and facilitation in an implementation trial: implications for the development of the PARIHS framework. *Implement. Sci* 8:28

In bridge, context is trump.

You can't escape complexity





Challenge

- While you are improving the current system, think about where and what you want the system to be in the future.

A few take-home points

- “Do not be daunted by the enormity of the world’s grief. Do justly, now. Love mercy, now. Walk humbly, now. *You are not obligated to complete the work, but neither are you free to abandon it.*”
- Combine the best of the hedgehog and the fox
- Be pragmatic
- Don’t be afraid to swim upstream

A REUTERS SERIES

Out of Control

America's losing battle against diabetes

Part Two

Drugmakers pushed aggressive diabetes therapy. Patients paid the price.

Pharmaceutical giants launched years-long marketing campaigns for a treatment target they helped create, and as their sales of diabetes drugs soared, so did incidents of low blood sugar, a potentially deadly medication risk.

By ROBIN RESPAUT, CHAD TERHUNE and DEBORAH J. NELSON

Filed Nov. 4, 2021, 11 a.m. GMT



THE RESISTANCE: Dr David Aron (above) and other diabetes specialists with the Veterans Affairs health system urged the VA not to adopt an A1c below 7% measure. David Aron/Handout via REUTERS

A few more take-home points

- Make connections
 - People: Learn from the best and teach the best
 - Concepts/ideas: Read widely
- Challenge assumptions
- Do it for the grandchildren
- Remember: Life is much too LONG not to have fun.

*It is very dangerous to take that first
step out the door. You never know
where the road will take you.*

Bilbo Baggins



“There are stars up above, so far away we only see their light long, long after the star itself is gone.

And so it is with people we loved – their memories keep shining ever brightly though their time with us is done.

But the stars that light up the darkest night, these are the lights that guide us. As we live our days, these are the ways we remember.”



Thank you, Duncan

And thanks for listening.

Horace Walpole

“[his wit] consisted in an exquisite perception of points of analogy and points of contrast too subtle for common observation... Walpole perpetually startles us by the ease with which he yokes together ideas which there would seem at first sight to be no connection.”

Thomas Macaulay



Tame problem

1. Well-defined problem statement
2. Definite stopping point
3. Right or wrong solution
4. Similar to others of same class
5. Solutions easily tried and dropped
6. Few alternate solutions

Jeff Conklin, Wicked Problems and Social Complexity