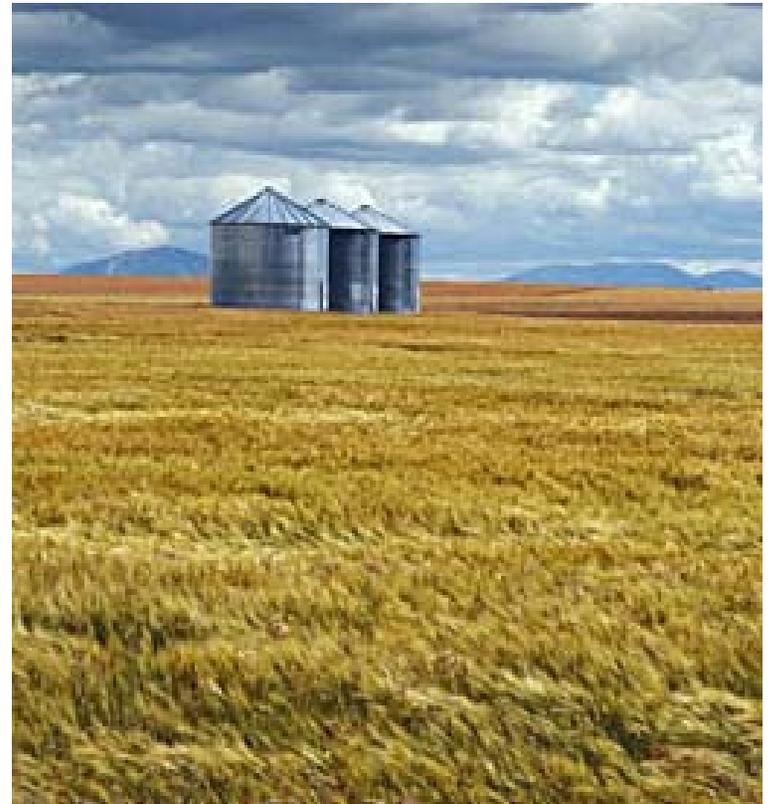


Navigating among Silos:

Adventures in Interdisciplinary Research

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January 21, 2009



Outline

Where will we be going?

First, will suggest why “interdisciplinary” matters to me

- Living in interesting times
- Interdisciplinary thinking
- T1-T2

Then,

- Working together to solve a common problem

And finally, discuss two examples

- Oxygen therapy
- Asthma therapy



Living in “interesting times”

Opinion: interdisciplinary work fosters creative thinking

~ 30 years ago



Then - Engineering draftsman
Now - Biomedical engineering

...Noteworthy in 1975

Microsoft Founded

\$0 Trade with China

Saturday Night Live debut



Our generation has had the unique opportunity to witness an entire life cycle of technology (imaging, sensors, IT).

Standard of living improvement and wealth creation through applied technology.

Interdisciplinary thinking

Just think about those textbooks that are quickly obsolete

Interdisciplinary

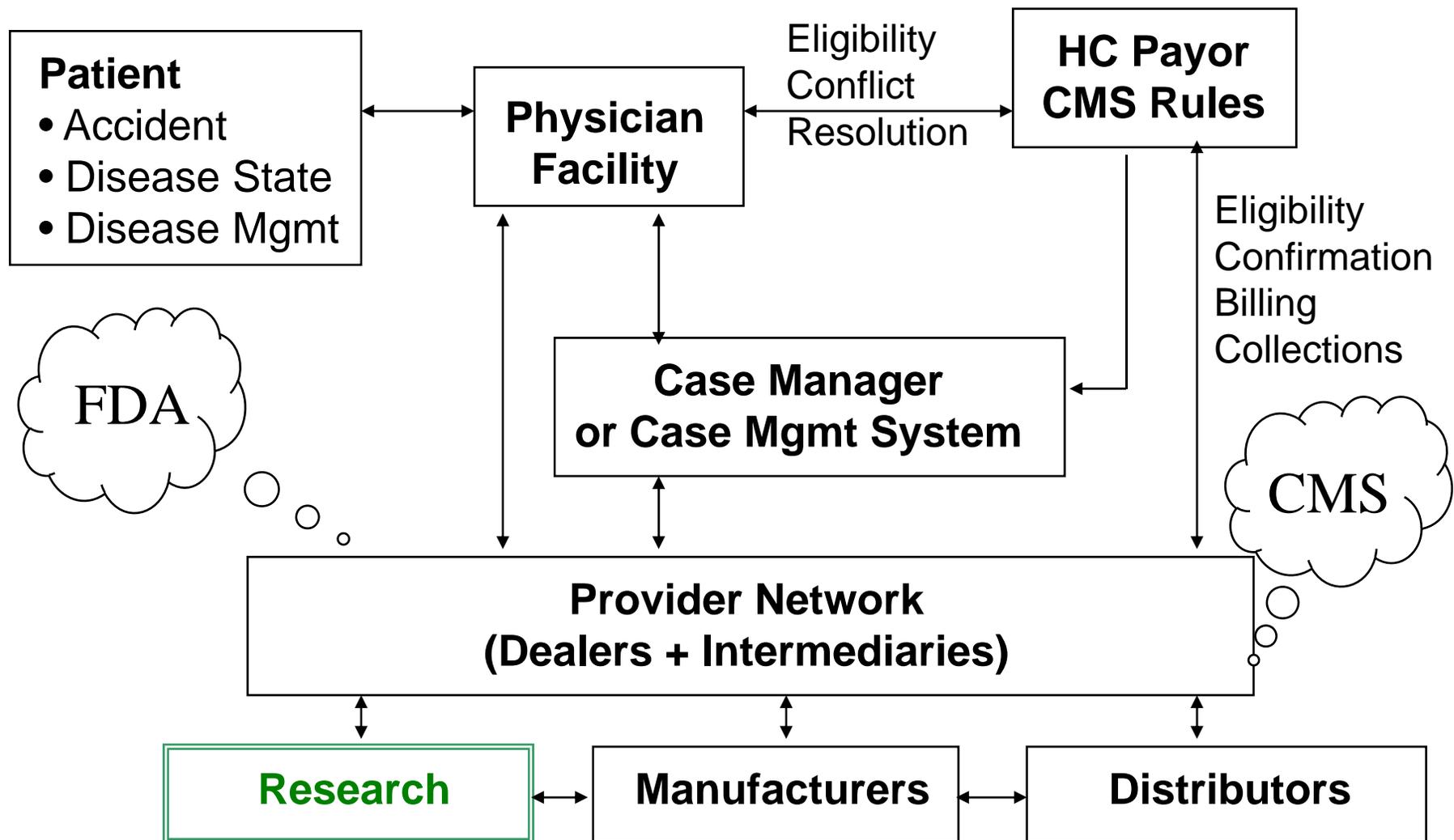
Of, relating to, or involving two or more disciplines that are usually considered distinct.

Some (obvious) examples:

- Women's health = Human biology + social issues
- Medical imaging = Oncology + image reconstruction
- Environmental Health = Environment + individual health science
- Translational research = Basic science + clinical research
- Product manager = Marketing + engineering + supply chain

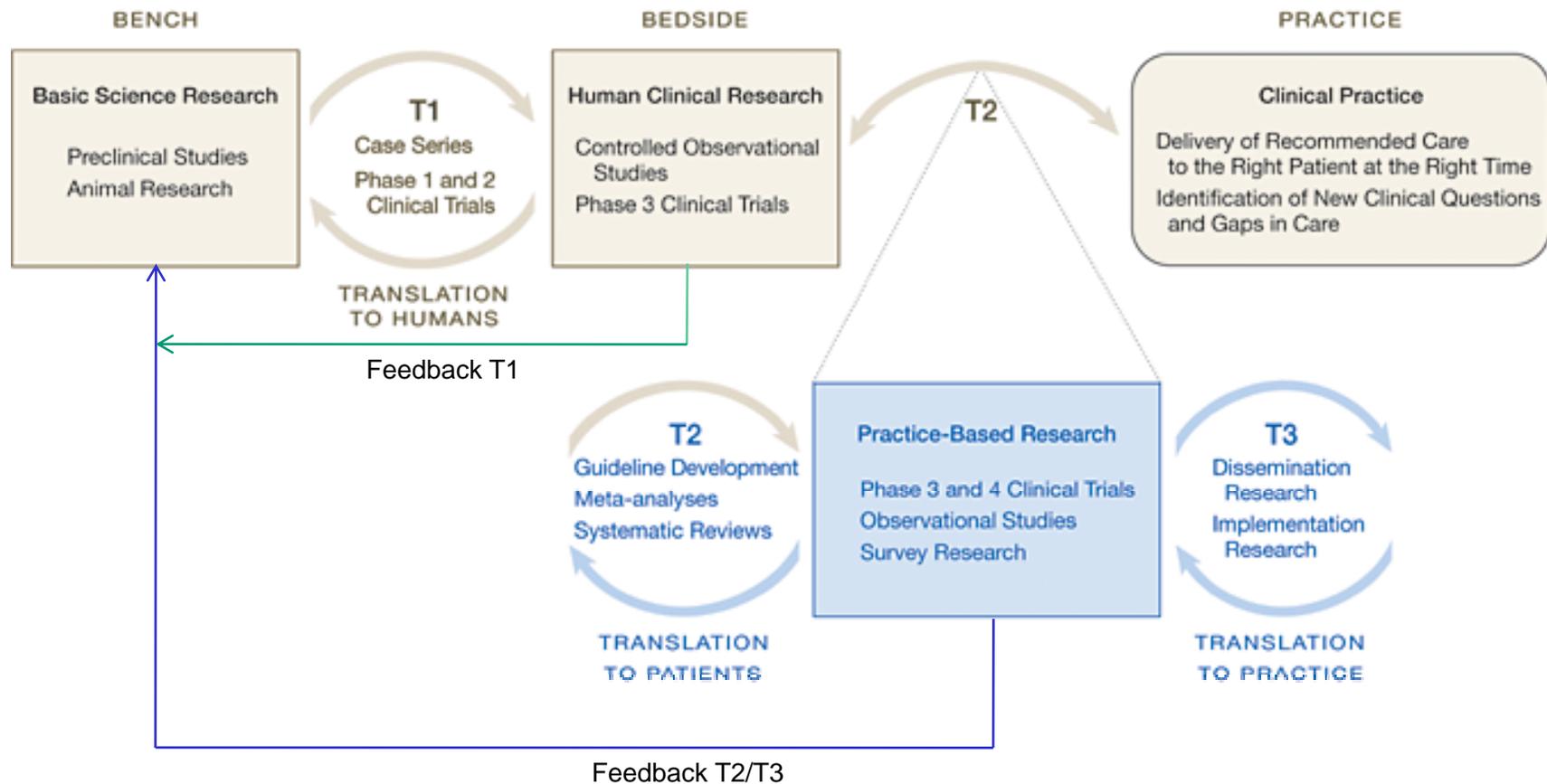
Is this “interdisciplinary”?

I used to think just the “research” box was hard!



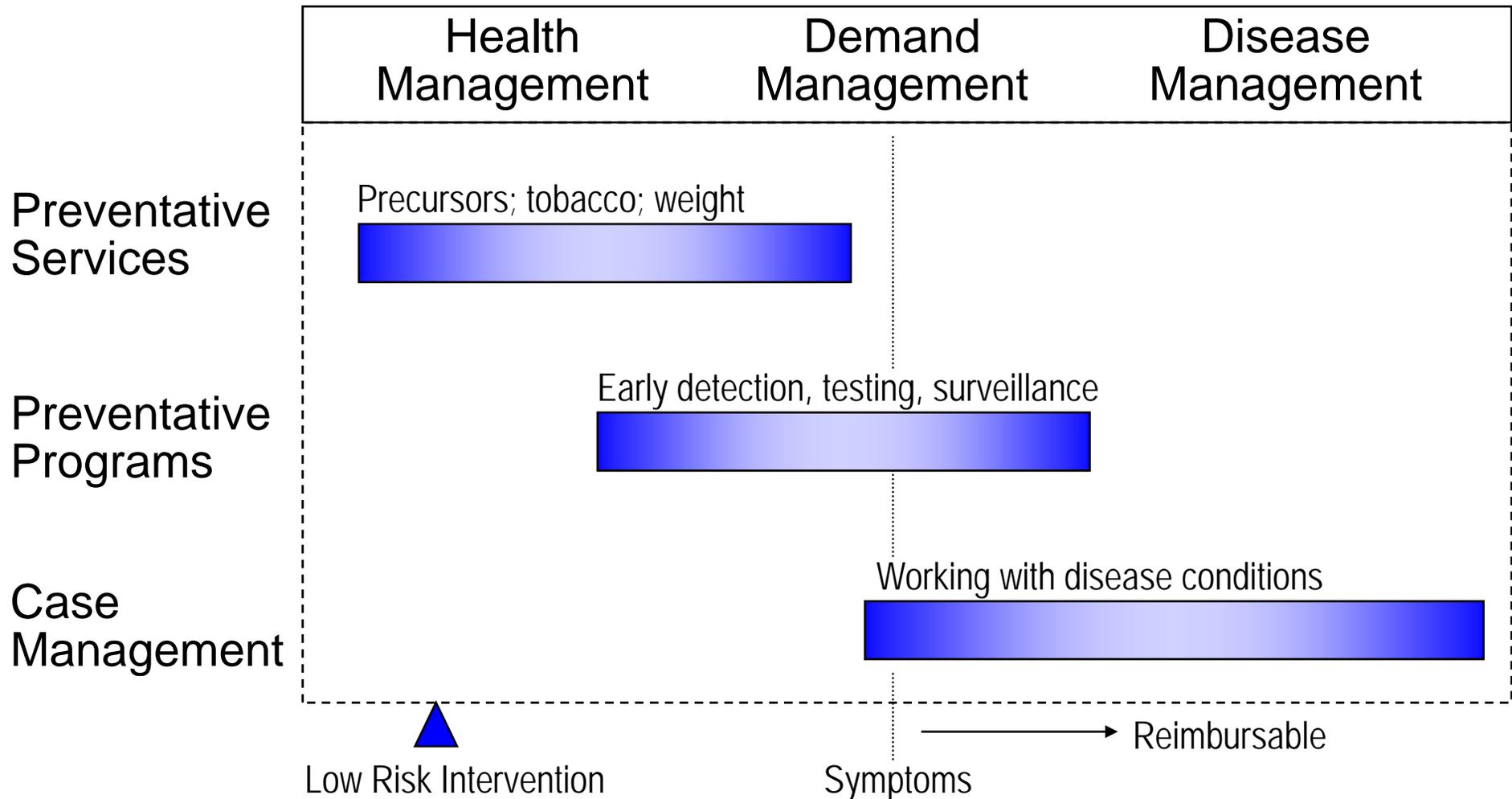
OK, so let's expand the "research" box

Living life at the edge of T1



T2-ish “stuff”

Wow, not enough time to go through this one!



Adapted from Victory(2005) and Baun(2003); Hill(2004)

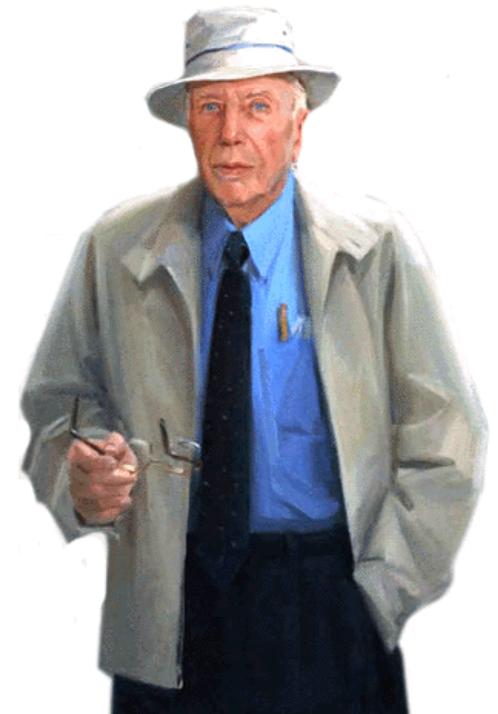
And one BME perspective

Vision of the Wallace H. Coulter Foundation

“The Translational Research Partner Institutions will work closely with the Foundation to promote, develop and realize the clinical potential of translational research.

The ultimate goal of this partnership is to focus on outcomes which will

- save, extend, and improve patient lives
- suffering from any disease or condition,
- in any size market,
- in any discipline,
- in any country around the world.”



Quoted from: http://www.whcf.org/WHCF_TranslationalPartnershipAward.htm

Working together to solve a common problem

Not just contributing “your” piece of the solution

Problem components:

- Objectives: desired outcomes
- Controlled variables: courses of action
- Uncontrolled variables: the environment
- The relationship between these three (a measure of value)

Solving interdisciplinary problems requires:

- Competence
- Composure
- Creativity
- Courage
- Sociability
- Communication

{ = Totally credible problem solver }

Oxygen therapy

Issue: product-to-product variance

Situation

- Pulse delivery of O₂ for COPD
- Improves mobility and quality of life
- Very profitable business

Issue / problem

Lack of standardized labeling for a bewildering array of (pulse) conserving devices created patient confusion.

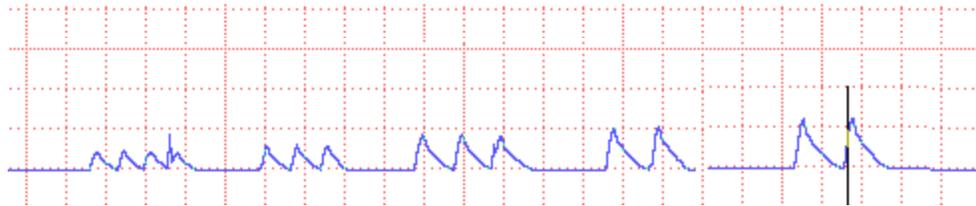
Desired outcome

- Clinical trial to test various devices
- Standardize labeling
- Publish results for the “greater good”

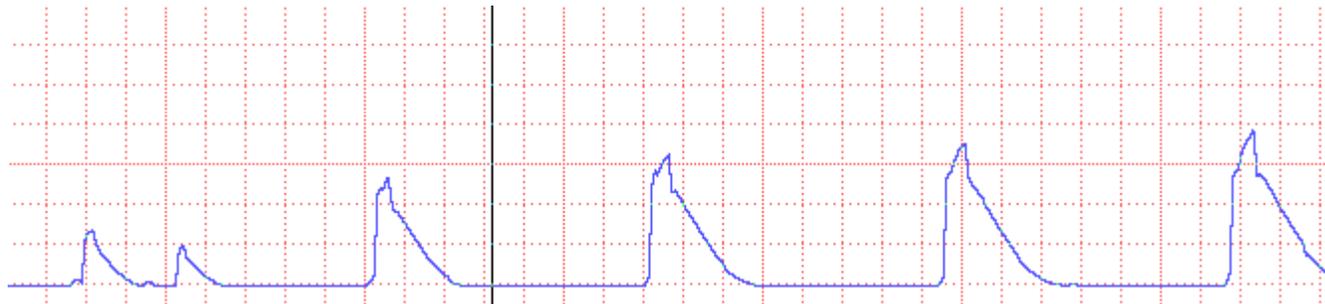


Oxygen therapy

Same "setting" different device



Device A



Device B

Oxygen therapy

Solving this particular problem

1. All “MBA’d up” and ready to build a team
2. First step, build the team.
Lot’s of cold calls.
Needed to build trust
3. Refine the problem.
Lot’s of time needed to find the right questions
4. Perform the clinical trial
Discovered some things along the way
Time scale mismatch
5. Report the results

Asthma Education

Issue: invest in new product design or more education?

Situation

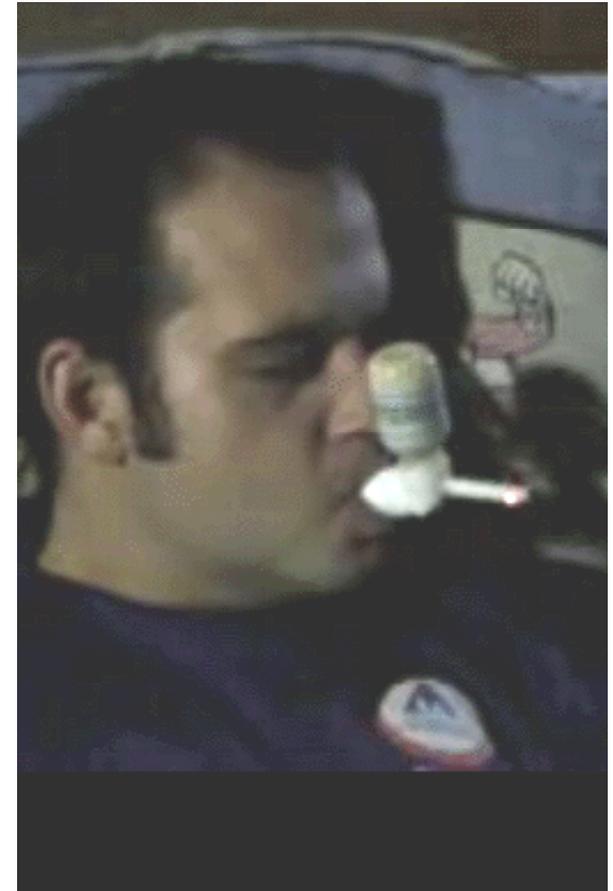
- Prevalence of asthma
- Improper use of inhalers
- Exacerbations leading to ER visit

Issue / Problem

Would better treatment result from improved education or better device design?

Desired outcome

- Understand asthma education
- Consensus on educational strategies
- Hold a symposium for the “greater good”



(not a real patient)

Asthma therapy

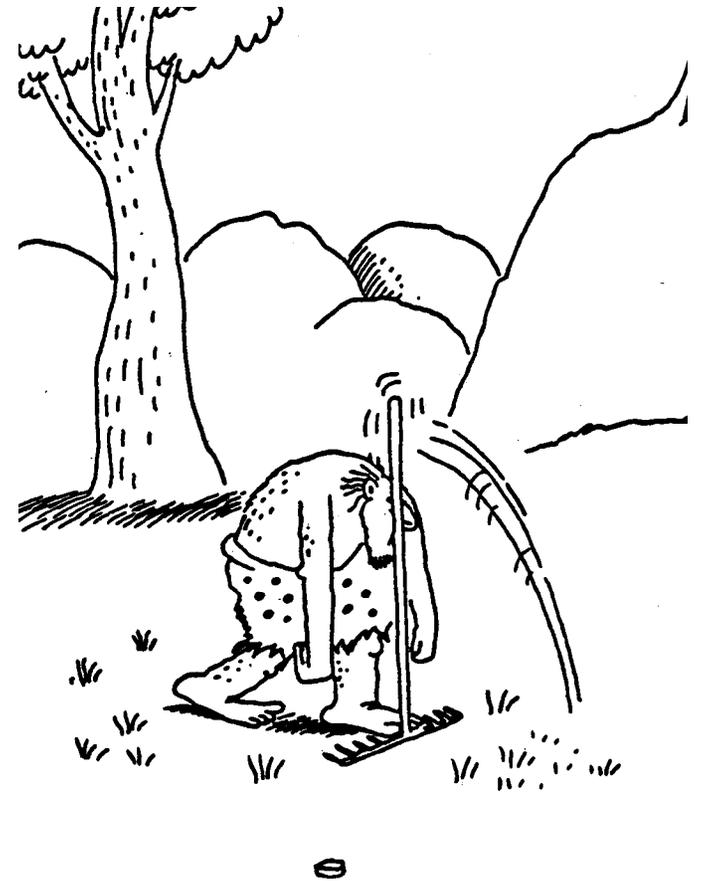
Solving this particular problem

1. All “MBA’d up” and ready to build a team
2. First step, build the team.
 Lot’s of cold calls.
 Needed to build trust
3. Refine the problem.
 Lot’s of time needed to underscore the education “thing”
4. Launched the conference
 Discovered some things along the way
 Concept mismatch
5. Report the results

Survival guide

Some “lessons learned” on interdisciplinary collaboration

- A. The reason for reaching out may not be the same as the reason for receiving.
- B. The primary path forward is sometimes a secondary one.
- C. The truth might be irrelevant – you have to be believed to be heard.
- D. Everything I really needed to know I learned in the field.



Audio podcasts and the accompanying
PowerPoint slides from the Practice-
Based Research Network Seminar Series
are available online at

<http://blog.case.edu/jjw17>