

Best Evidence

or

Best Guess



Dr Baxter Larmon

Professor Medicine

David Geffen School Medicine at *UCLA*



**Academic EMS
is NOT an
Oxymoron**

Prehospital Care Research Forum

Challenging the future of EMS

Mission: To assist, recognize
and disseminate prehospital
care research conducted at
all provider levels



Research is what I
am doing when I
don't know what I
am doing

Werner Von Braum



HISTORICAL PERSPECTIVE



Those of us who fail to learn from
the lessons of history are doomed
to repeat the past

Winston Churchill



1966 DOT published the White Paper

Listed 29 recommendations for the improvement of the American emergency health care system. *Eleven specifically dealt with EMS*

“Things are seldom
what they seem”

Stewart, RD

Annals of Emergency Medicine

1989:18:1015-7



Michael Calaham, MD



*Quantifying the Sanctity Science of
Prehospital Emergency Care”*

Annals of Emergency Medicine;
December 1997





*It is possible to document exactly how much scientific support there is for the efficacy of our present scope of EMS practice, and it is **IMPRESSIVELY DEFICIENT***

There is virtually **NO** aspect of EMS that could meet the current requirements of the FDA for approval as a safe and effective new therapy

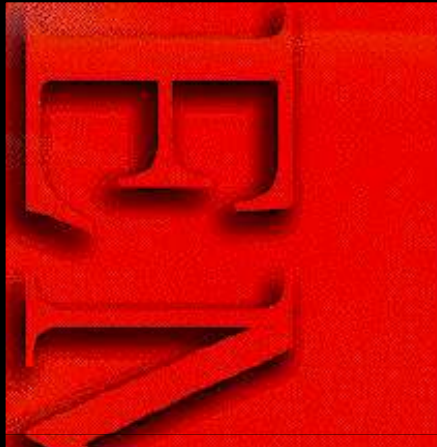


TECHNOLOGY: Help or Hindrance ?



New from

[www.i am not an ambulance driver.com](http://www.i-am-not-an-ambulance-driver.com)



EMERGENCY

MEDICAL

SERVICES

AGENDA

FOR

THE

FUTURE

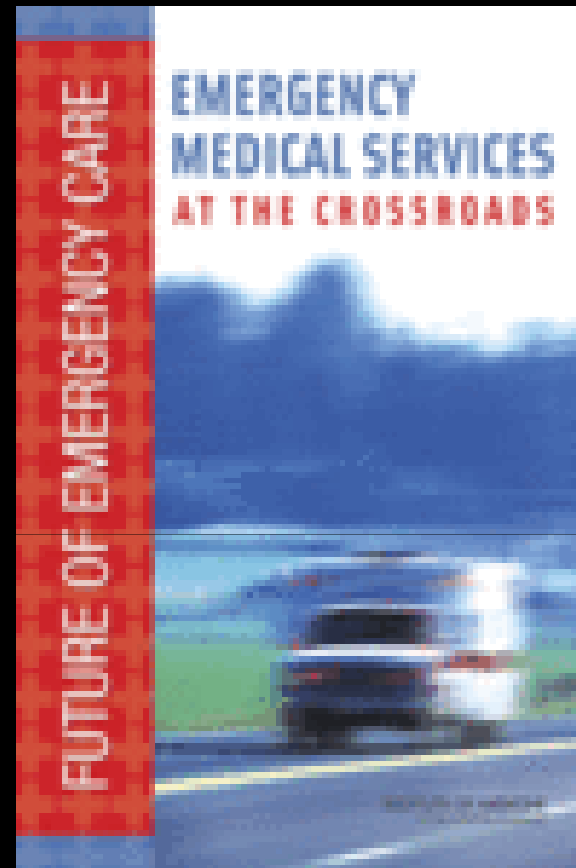


Agenda for the **FUTURE**

Agenda for the Future

- Integration
- **Research**
- Human Resources
- Medical Direction
- Education
- Prevention
- Clinical Care
- Evaluation
- Public Education
- Legislation
- System Finance
- Public Access
- Communication
- Information Systems

Institute of Medicine Report



2006

We did what we felt was **RIGHT**



Tough to admit

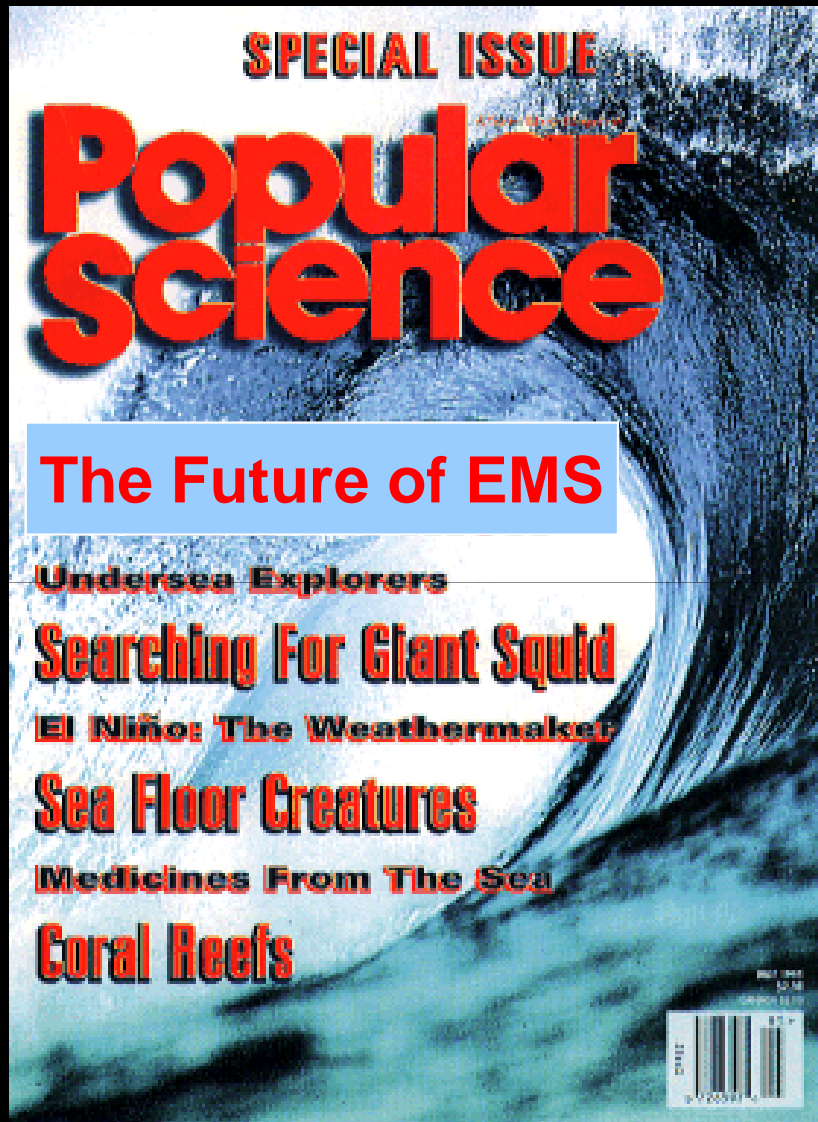
- We were wrong
- Didn't know the answer
- We guessed



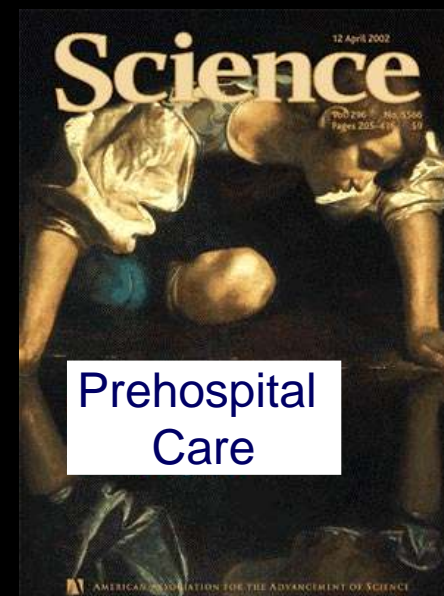
**Medicine
is a
JOURNEY**



Not a
DESTINATION



Medicine is SCIENCE



Science is based on RESEARCH



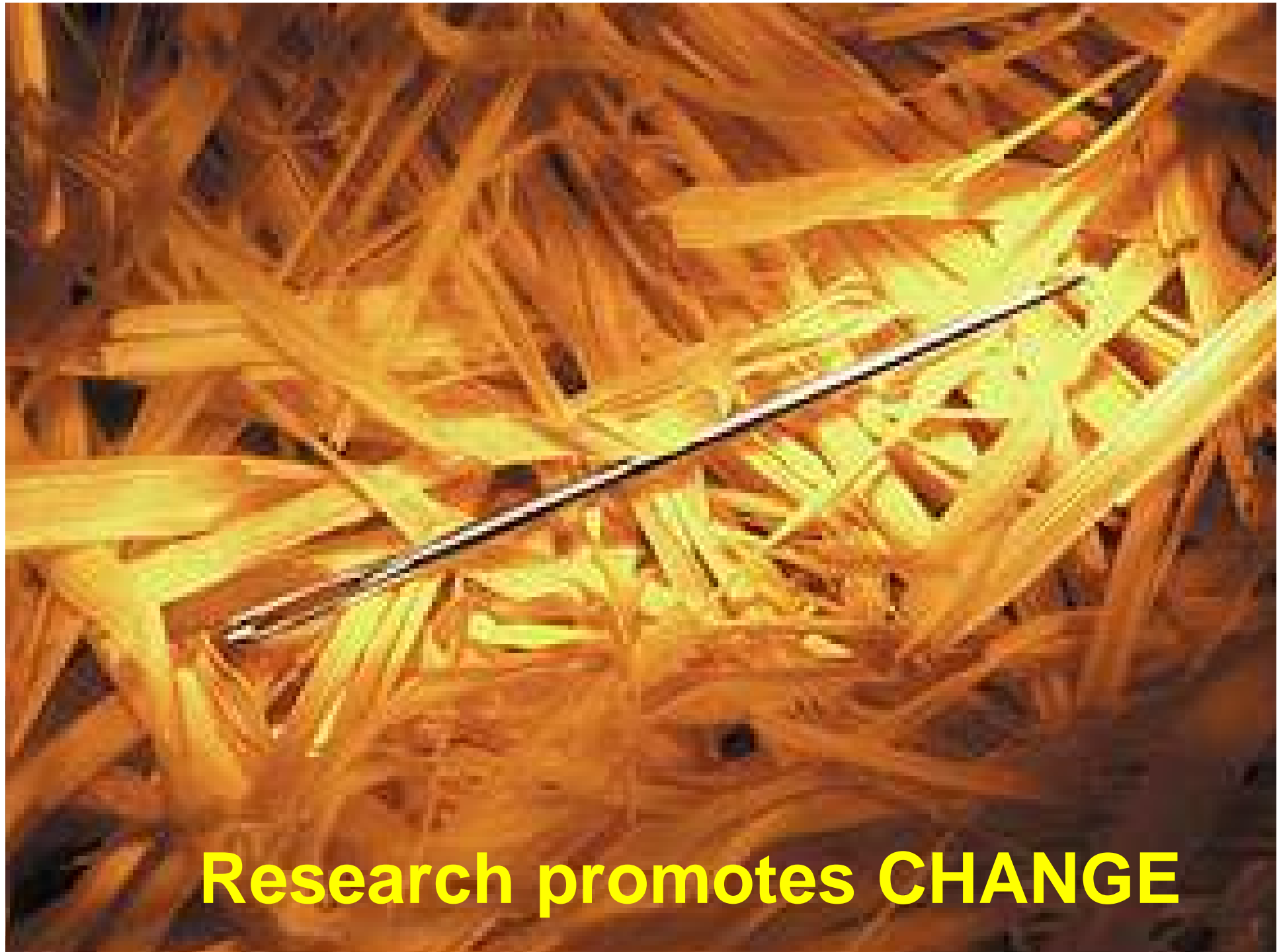
WARNING: Insufficient Medical Research Can Be Hazardous To Your Health

Too many Americans are suffering and dying needlessly because, as a nation, we don't invest enough in medical research.

That's why former Surgeon General C. Everett Koop is joining RESEARCH!AMERICA, an alliance for discoveries in health, in making this simple request:

Take action! Let your voice be heard in support of medical research as the nation's No. 1 national priority.

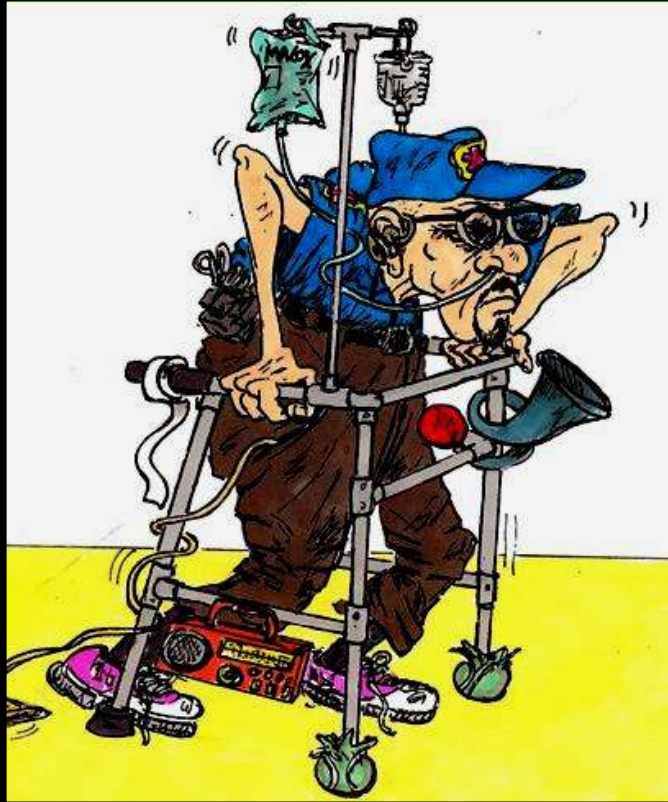
CALL 1-800-366-CURE for information on how to deliver your WARNING.



Research promotes CHANGE



Are we
open to
CHANGE ?



Open Minded ?





Change can be GOOD



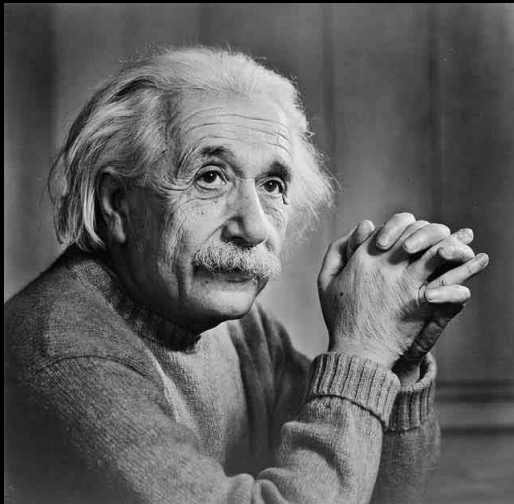
Change
Can Be
GOOD



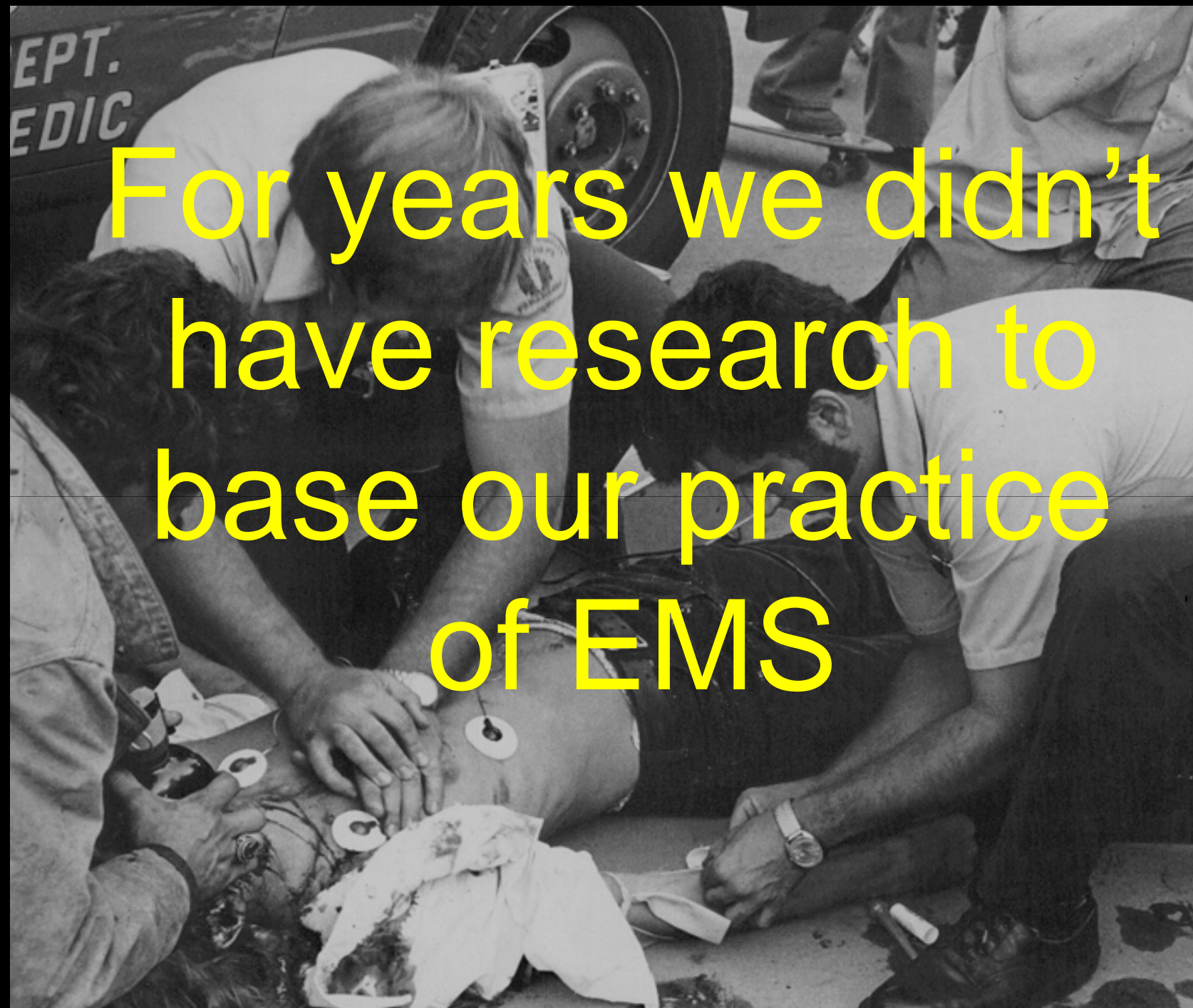
If I knew THEN,
What I know NOW



The significant problems we
face cannot be solved at the
same level of thinking we
were at when we enacted them



Albert Einstein



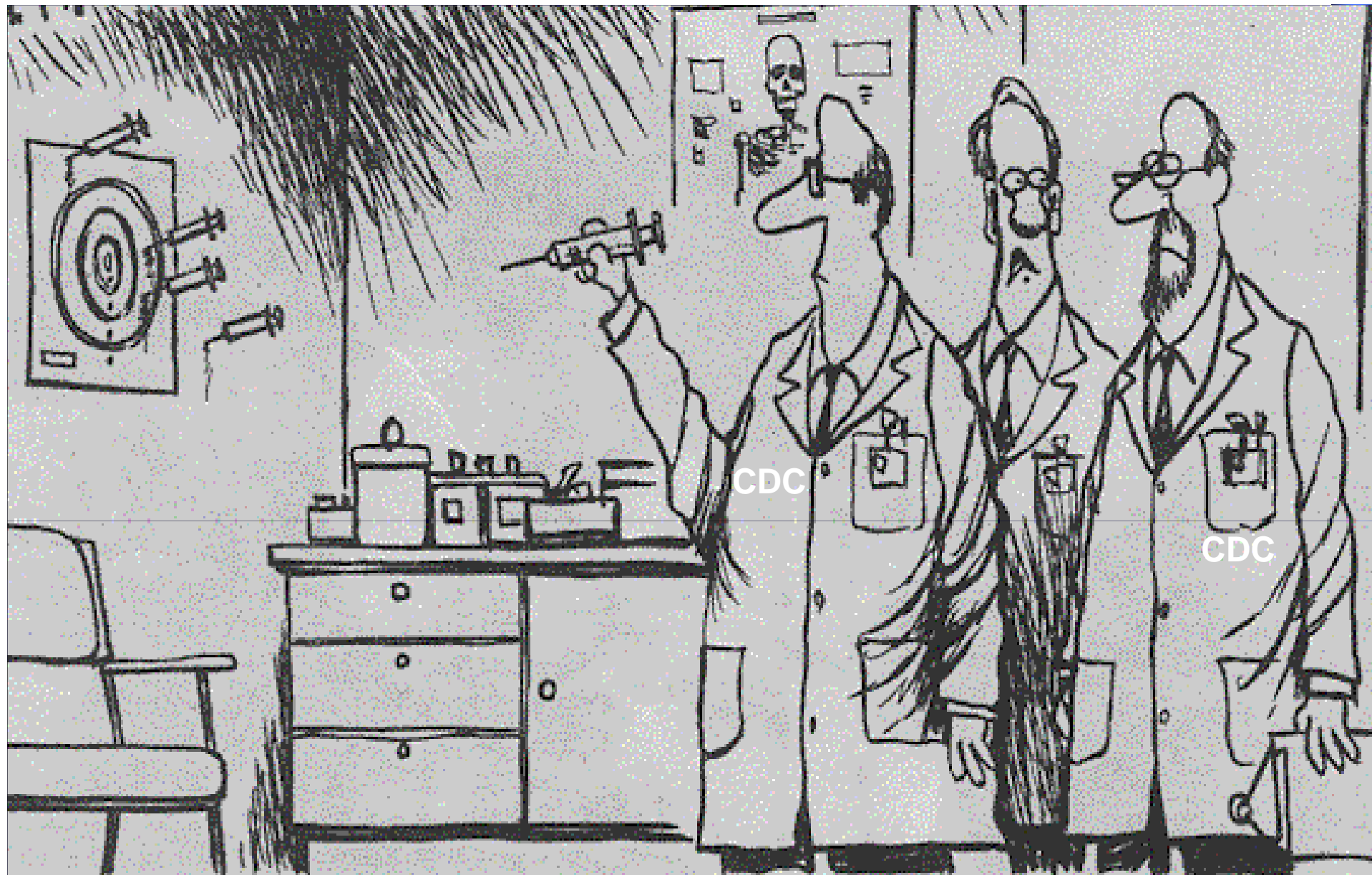
For years we didn't
have research to
base our practice
of EMS



Some of EMS was based on

Best guess

Anecdotal evidence



"I hate it when we're not sure we're inoculating against the right strain of flu virus."



Evidence based medicine ??

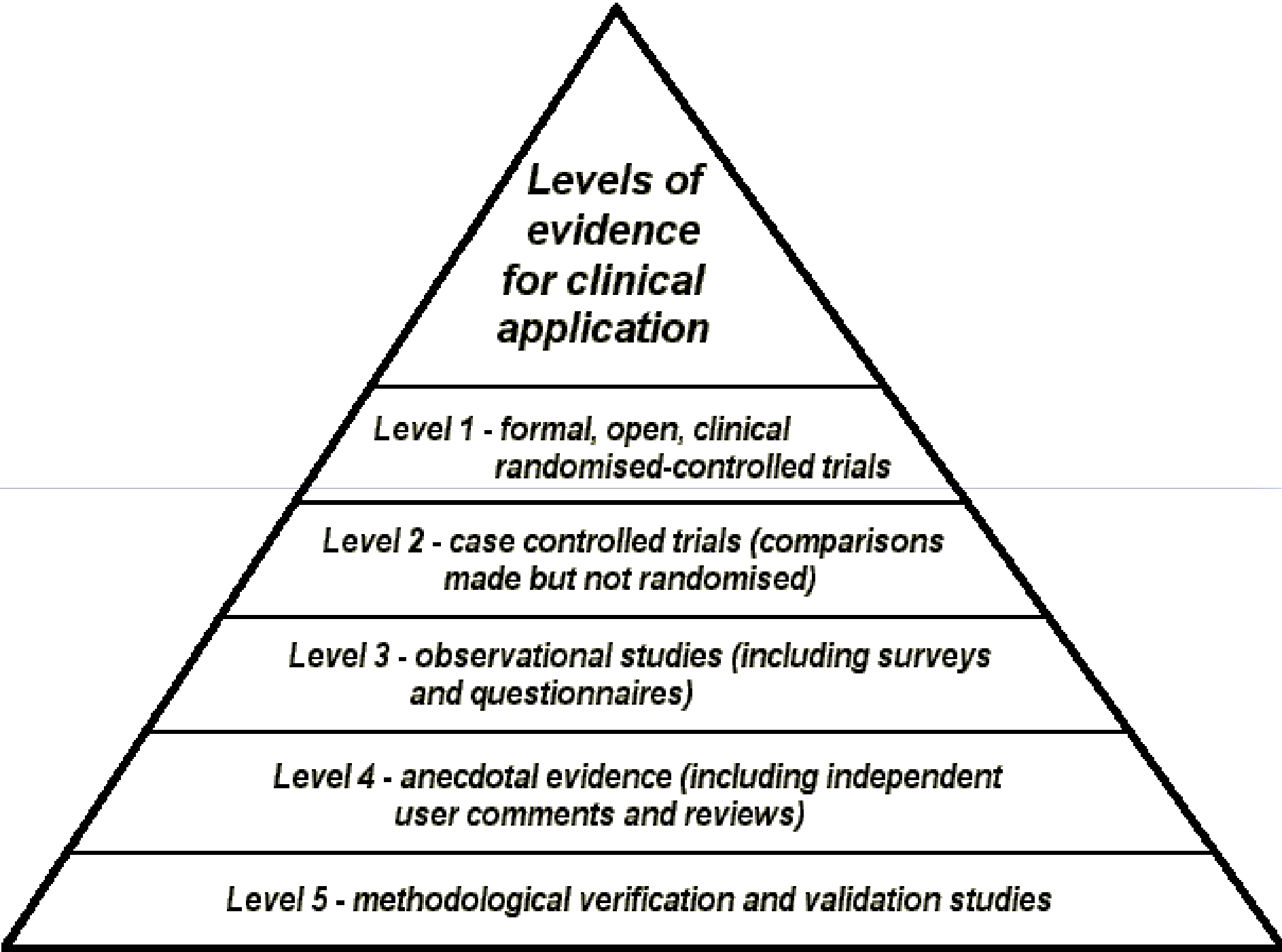
HISTORY

EVIDENCE BASED MEDICINE

- Before the 1836, Bloodletting was routinely used to “cleanse the body” by physicians
- Pierre Louis, conducted an outcome clinical study
 - Specifically pneumonia patients
- Found that bloodletting was linked to far more deaths
 - Changed the practice of medicine







**Levels of
evidence
for clinical
application**

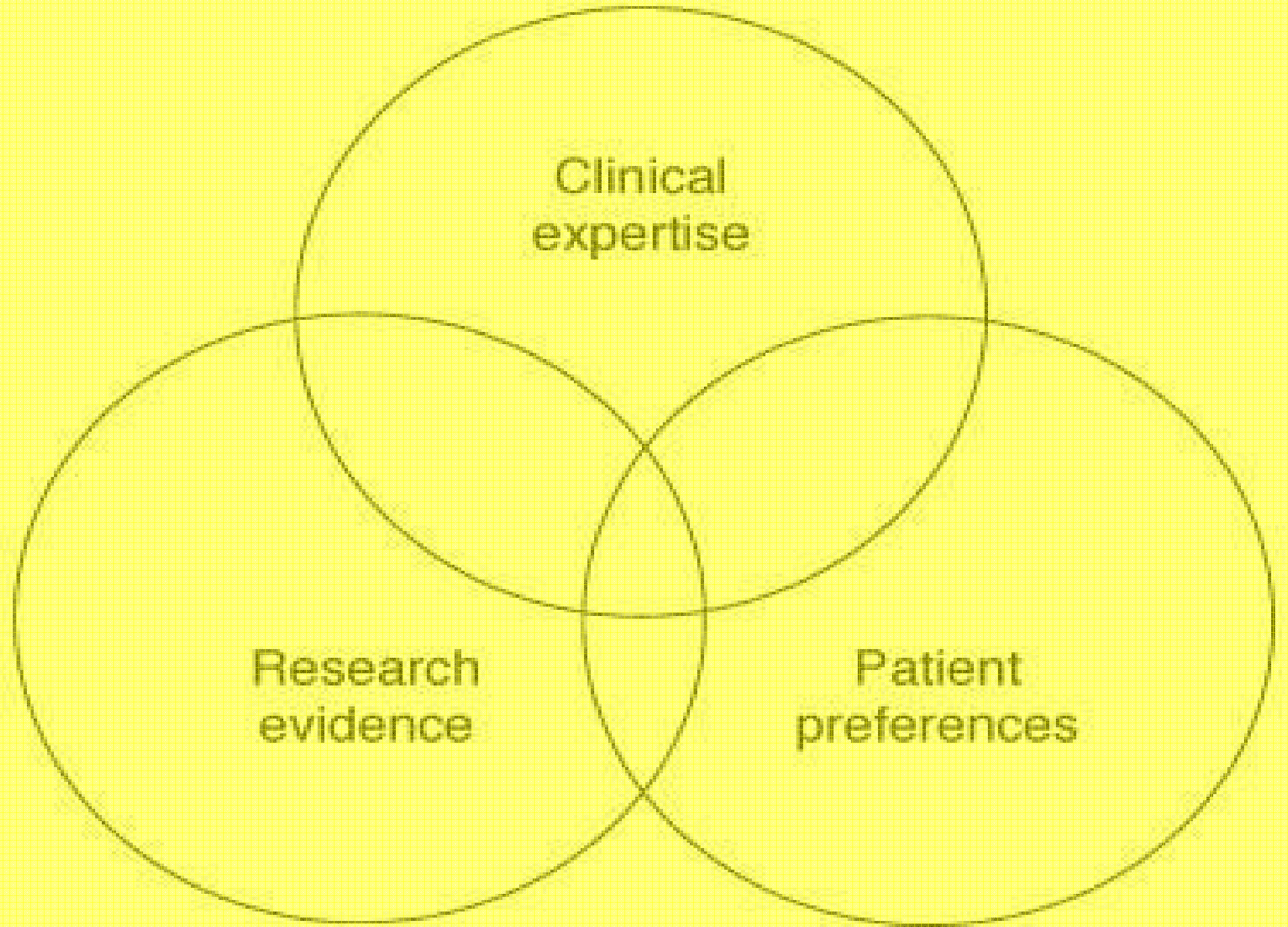
**Level 1 - formal, open, clinical
randomised-controlled trials**

**Level 2 - case controlled trials (comparisons
made but not randomised)**

**Level 3 - observational studies (including surveys
and questionnaires)**

**Level 4 - anecdotal evidence (including independent
user comments and reviews)**

Level 5 - methodological verification and validation studies



Clinical
expertise

Research
evidence

Patient
preferences

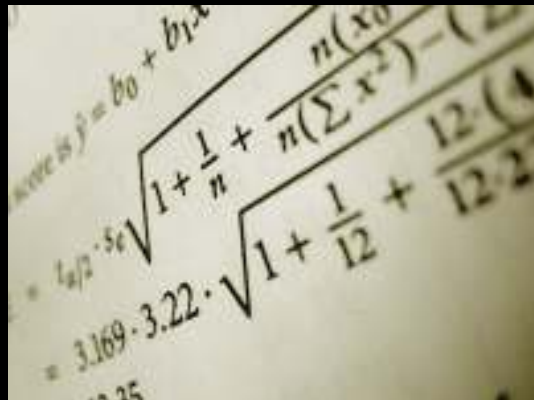
Need to remember
that EMS is
Science

Science depends on **RESEARCH**



Explore The Possibilities

Research is based on **STATISTICS**



Regression equation: $\hat{y} = b_0 + b_1x$

Standard error calculation: $s_e \sqrt{1 + \frac{1}{n} + \frac{n(x_0 - \bar{x})^2}{n(\sum x^2) - (\sum x)^2}}$

Calculation: $= 3.169 \cdot 3.22 \cdot \sqrt{1 + \frac{1}{12} + \frac{12 \cdot (4 - 2)^2}{12 \cdot 2 - (4)^2}}$

Do statistics
really prove
anything ?



RECLAIMED
WATER
IN TOILET!
DO NOT
DRINK!

RECLAIMED WATER IS NOT POTABLE

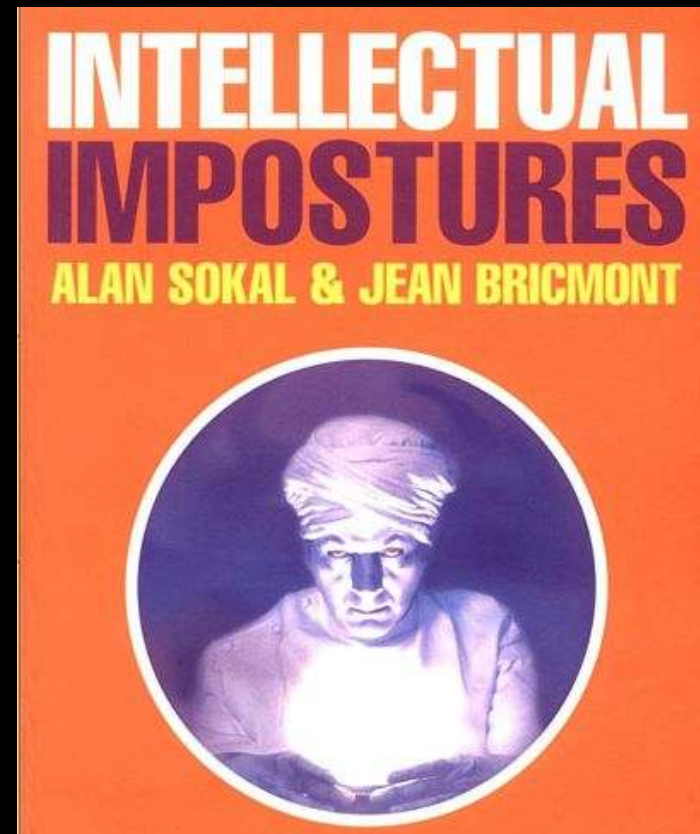
FOR DRINKING PURPOSES

SOMETIMES

Some
Things
Are
Obvious

It's **PUBLISHED**

It must be
TRUE

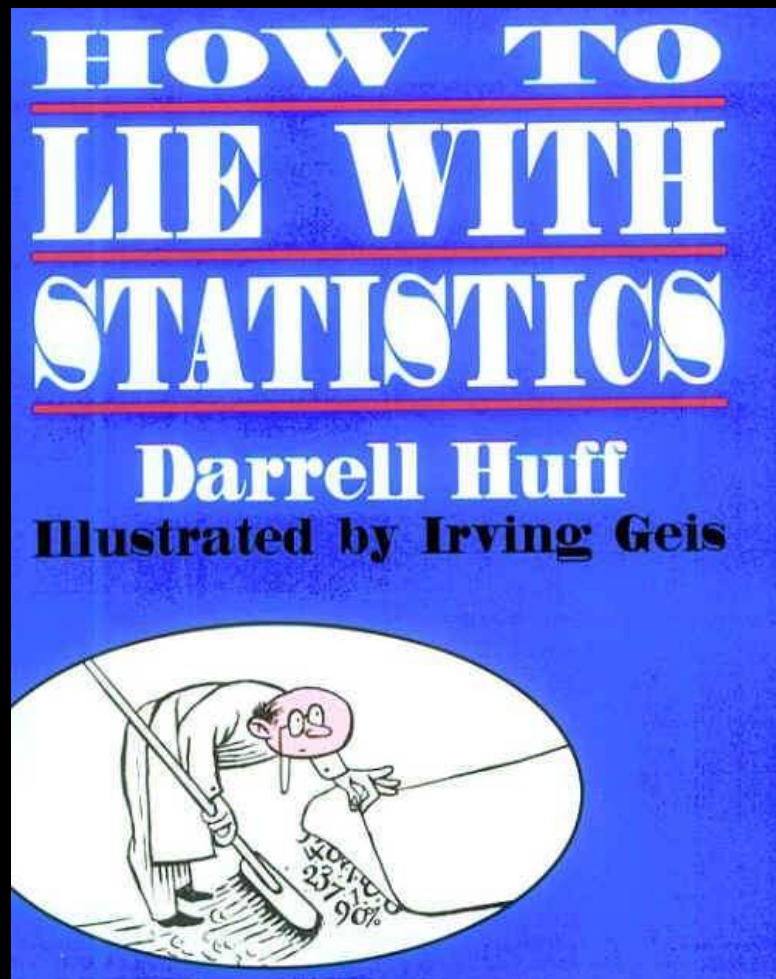




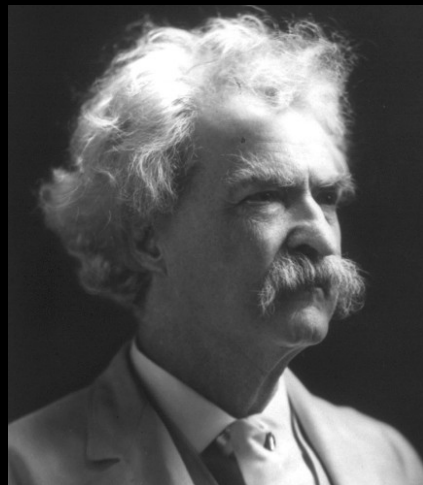
Not
everything
IS
how
it
appears

GET Help

Understanding Data



There are three kinds of lies:
Lies, Damn Lies, and
Statistics.



Mark Twain

WHO'S DOING OUR RESEARCH ?

- Academic Institutions
- Physicians
- Manufacturers
- EMS Providers

Twelve Step Approach to EMS Research



STEP 1

Identify the topic

Define a question or answer

Be sure of the question
before you start looking
for the answer

Dr Ronald Stewart



STEP 2

Formulate a Hypothesis

The true worth of a researcher
lies in perusing what he did not
seek in his experiment as well as
what he sought.



Claud Bernard

French Physiologist

STEP 3

Conduct a Literature Search

and

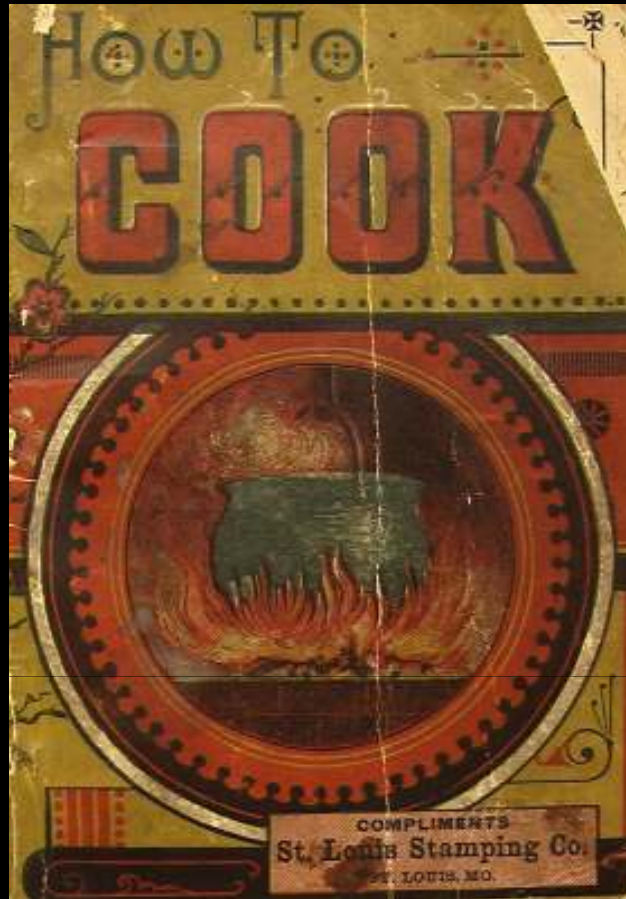
Consult with Epidemiologist

STEP 4

Type of study

STEP 5

Develop Methods



Passion Fruit Mousse

You'll need:

- 1 1/4 cups passion fruit puree
- 1 1/4 cups orange juice
- 3/4 cup sugar
- Scant 1 tablespoon gelatin dissolved in 2 tablespoons water
- 3 cups heavy cream, whipped
- 2 finger bananas
- Coarse sugar
- 1 kiwi, peeled, cut in 1/2 and sliced

In a saucepan, heat the passion fruit puree, orange juice, and sugar until dissolved.

Add the gelatin to the hot juice and stir to melt and combine. Strain the liquid into a bowl and place it over an ice bath. Stir it constantly with a rubber spatula and when it just starts to set, fold in the whipped cream. Pour this into soup plates or dessert bowls and chill. If storing them overnight, cover them with plastic wrap.

To serve the mousse, remove the bowls from the refrigerator. Peel and slice the bananas in half lengthwise and dip the flat side in coarse sugar and caramelize them under a broiler or with a blowtorch. Place them on the mousse fanning them then tuck in a few half slices of kiwi.

STEP 6

Perform Power Calculation



STEP 7

Internal Review Board
Approval

STEP 8

Interaction with Providers

STEP 9

Pilot Trial

STEP 10

Conduct Study

Collect Data

STEP 11

Analyze Data

Know your resources and ask for support and help

Dr Ronald Stewart



STEP 12

Report Findings

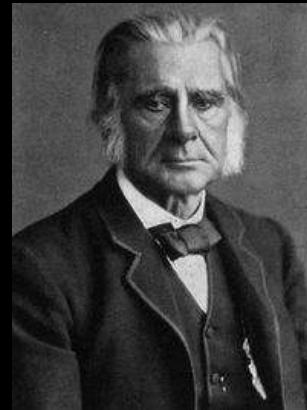


**BE PREPARED
FOR THE
UNEXPECTED**

The great tragedy of science- the
slaying of a beautiful theory by
an ugly fact

Thomas H Huxley

English Biologist

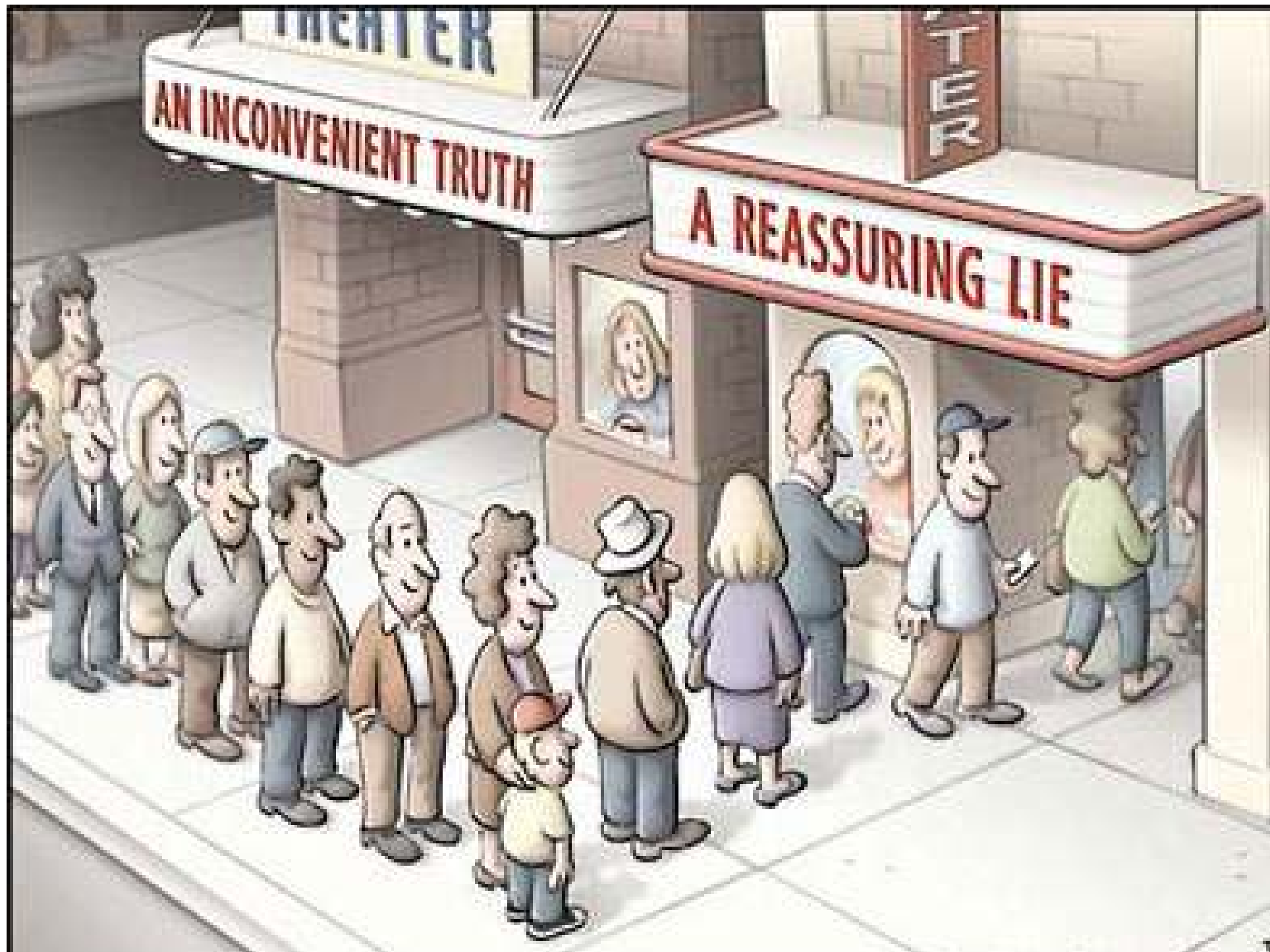




DON'T BE
AFRAID OF CHANGE.



YOU
can't
handle
the
Truth



Change
Can Be
GOOD



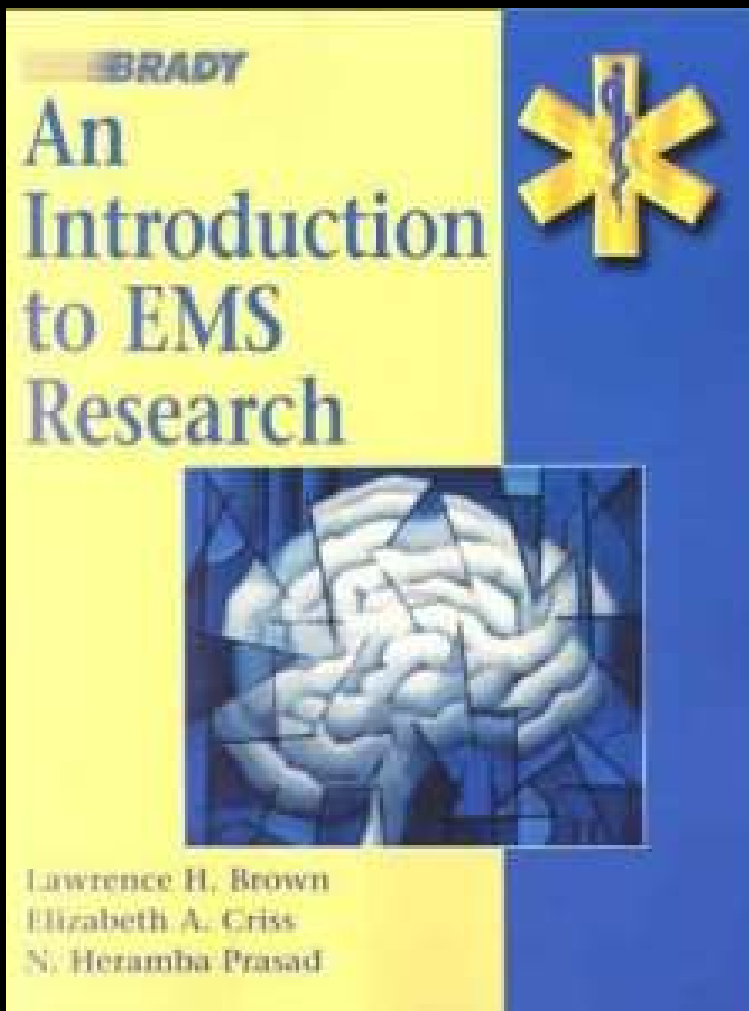
Be Careful what you ask for





A photograph of a herd of zebras in a savanna setting. The zebras are standing close together, and their black and white stripes are prominent. The background shows some dry grass and trees. Overlaid on the image is the text "Don't be AFRAID to STAND OUT" in a bold, yellow, serif font. The word "AFRAID" is in all caps and larger than the other words. The word "STAND OUT" is also in all caps and larger than "to".

Don't be
AFRAID
to
STAND OUT



Consider this book

A
GREAT IDEA
Should
Never
Be Wasted



Bax & Dave



The Prehospital
Care Research
Workshop

The National EMS Research Agenda



<http://www.nhtsa.gov/people/injury/ems/ems-agenda/EMSResearchAgenda.pdf>

Prehospital Care Research

Our future depends on it

Baxter Larmon
Professional Paramedic

