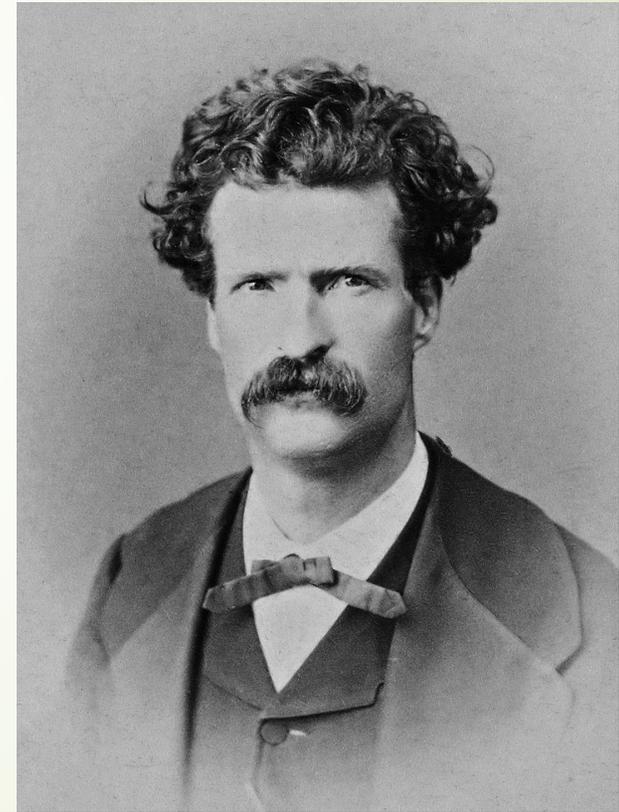




"There are three kinds of lies: lies,  
damned lies and statistics."

- *Mark Twain's Own Autobiography: The Chapters from the  
North American Review*





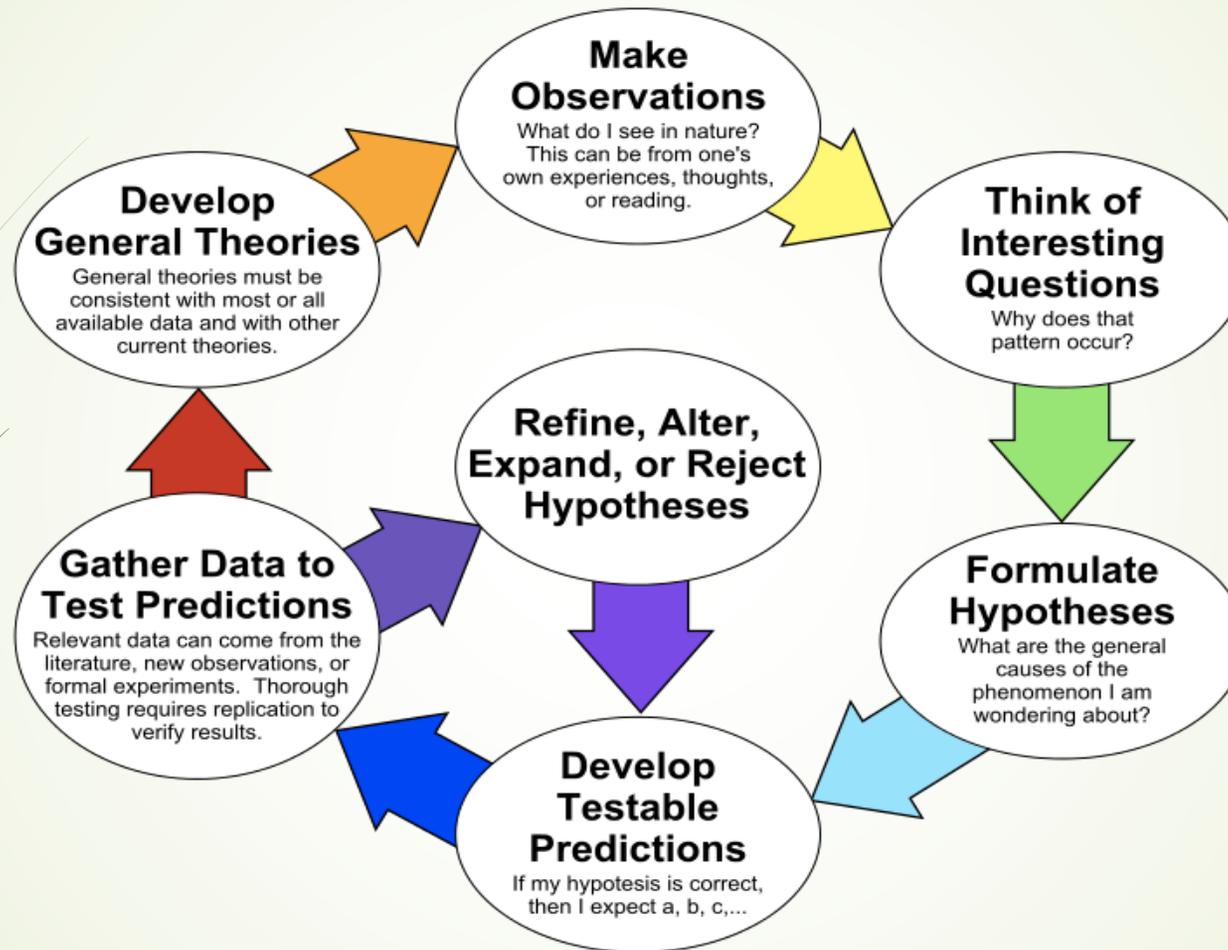
# EMS and Science

Asher Brand

Allen Yee

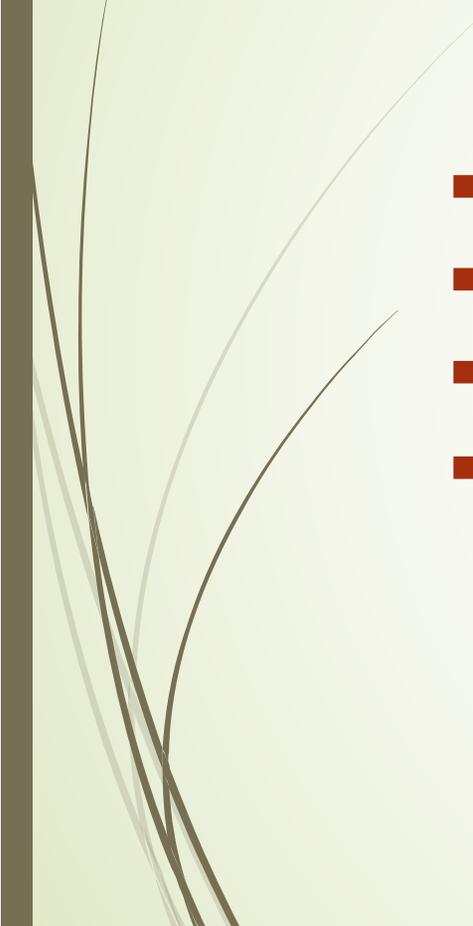
Matt Lawler

# The Scientific Method as an Ongoing Process





# Scientific Method

- IDEA
  - HYPOTHESIS
  - EXPERIMENT
  - THEORY
- 



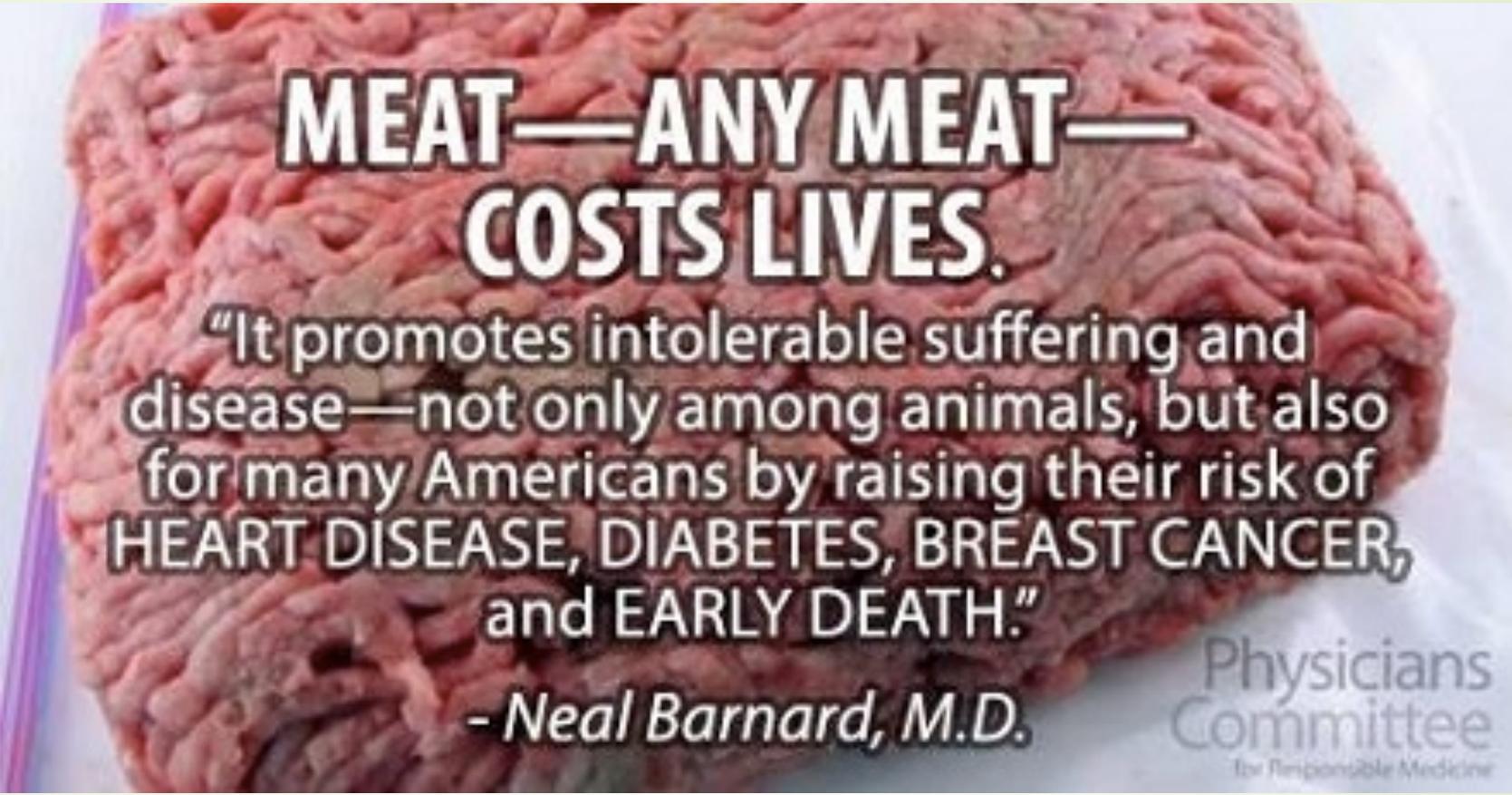
## What is hard

- Associations
  - Confounding Variables
  - Misleading terms
  - Statistical testing and what it means
- 



# Associations

- This is really IMPORTANT
- **“Association does not establish causation”**

A photograph of a package of ground meat, likely beef, with a white label. The text is overlaid on the image. On the left side of the overall image, there is a vertical green bar with a red arrow pointing right and some thin, curved lines.

# **MEAT—ANY MEAT— COSTS LIVES.**

**“It promotes intolerable suffering and disease—not only among animals, but also for many Americans by raising their risk of HEART DISEASE, DIABETES, BREAST CANCER, and EARLY DEATH.”**

**- Neal Barnard, M.D.**

Physicians  
Committee  
For Responsible Medicine

## **Foods That Lower Cholesterol**

- Oat cereal.
- Cereals with flaxseed.
- Whole grain cereals.
- Fruits.
- Nuts.
- Beans & peas.



**MensAnswer**



# Now that we more is know

- ▶ Sugar is the culprit
- ▶ Metabolic syndrome
- ▶ NOT Meat, Fat, protein (china study)
- ▶ What happened? Confounding variables...



# Misleading terms

- Risk
- Linked
- Associated
- Significant



[Int J Cancer](#). 2015 Oct 27. doi: 10.1002/ijc.29901. [Epub ahead of print]

## **Red and processed meat, nitrite, and heme iron intakes and postmenopausal breast cancer risk in the NIH-AARP Diet and Health Study.**

[Inoue-Choi M](#)<sup>1,2</sup>, [Sinha R](#)<sup>3</sup>, [Gierach GL](#)<sup>4</sup>, [Ward MH](#)<sup>1</sup>.

... by gender, ethnicity, education, and body mass index (BMI). Total red meat intake (p-trend=0.02). The risk was 25% higher in the highest vs. lowest intake qu...  
ake (Q5 vs. Q1) was associated with 27% higher risk of localized breast cancer (...  
al/distant cancer (95%CI=0.98-1.44, p-trend=0.10). In addition, higher nitrite inta...



# Relative Risk v. Absolute Risk

- ▶ Fact: In 2011 you were **300%** more likely to die in a Mazda 6 than a VW Jetta
- ▶ What does that mean
  - ▶ 19 deaths per million registered vehicle for VW
  - ▶ 58 deaths per million Mazda 6's
- ▶ Absolute risk
  - ▶ 19 out of 1 million, to 60 out of 1 million
  - ▶ **That is 1 in 33k to 3 in 33k**

Used to overstate  
differences



# Statistically Significant

- ▶ Apply the finding in a sample to a population
- ▶ It is all chance and probability
- ▶ 95% chance that the difference is real
- ▶ So, 1/20 chance that the difference is by chance alone
  
- ▶  $P=0.05$
- ▶  $P=0.0001$
- ▶  $P=0.1$

Confidence Intervals  
And  
Odds Ratios

OR = 2.3 (0.9 – 4.0)

# SALT

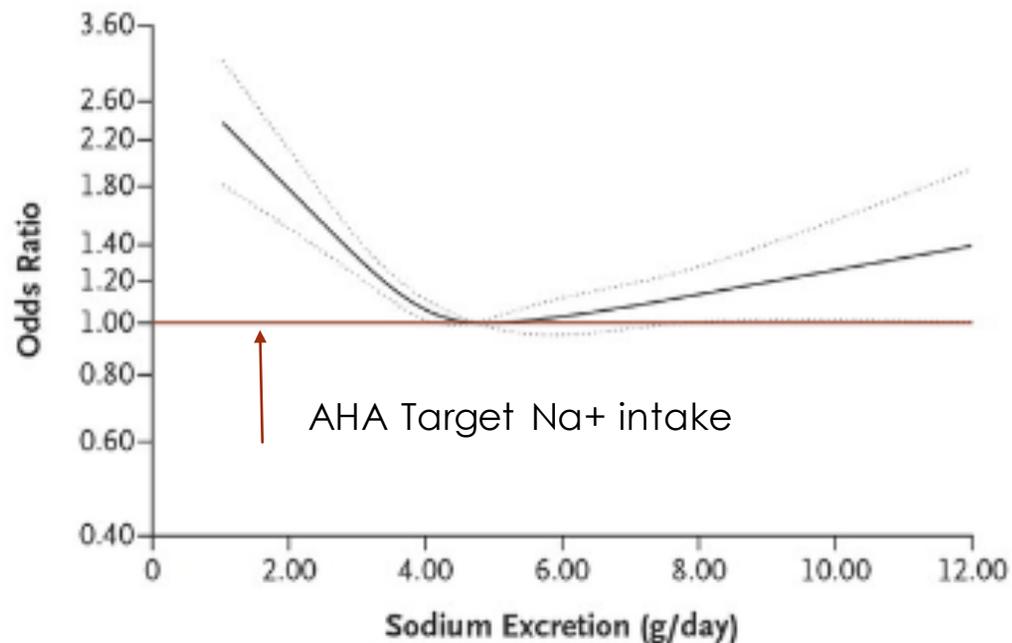
50,000 people self report intake  
Average SBP declines from 144 to 142  
\*\*Statistically significant\*\*



HEART-CHECK FOOD CERTIFICATION PROGRAM SODIUM LIMITS BY CATEGORY February 2015		
Food Category	FDA/USDA Product Category	Sodium Limit (in mg) per serving
Dairy Products	Cheeses not listed as separate subcategories	240
Dairy Products	Cottage cheese	240
Dairy Products	Cheese, grated, hard (parmesan, romano...)	240



### B Estimated Sodium Excretion and Risk of Death from Any Cause



No. of Events	68	642	826	340	79	16
No. at Risk	1817	30,124	46,663	18,395	3885	756

N Engl J Med 2014; 371:612-623



# Current paper in EMS/Stroke Land

- ▶ Review of recent



*The* **NEW ENGLAND**  
**JOURNAL** *of* **MEDICINE**

ESTABLISHED IN 1812

JANUARY 1, 2015

VOL. 372 NO. 1

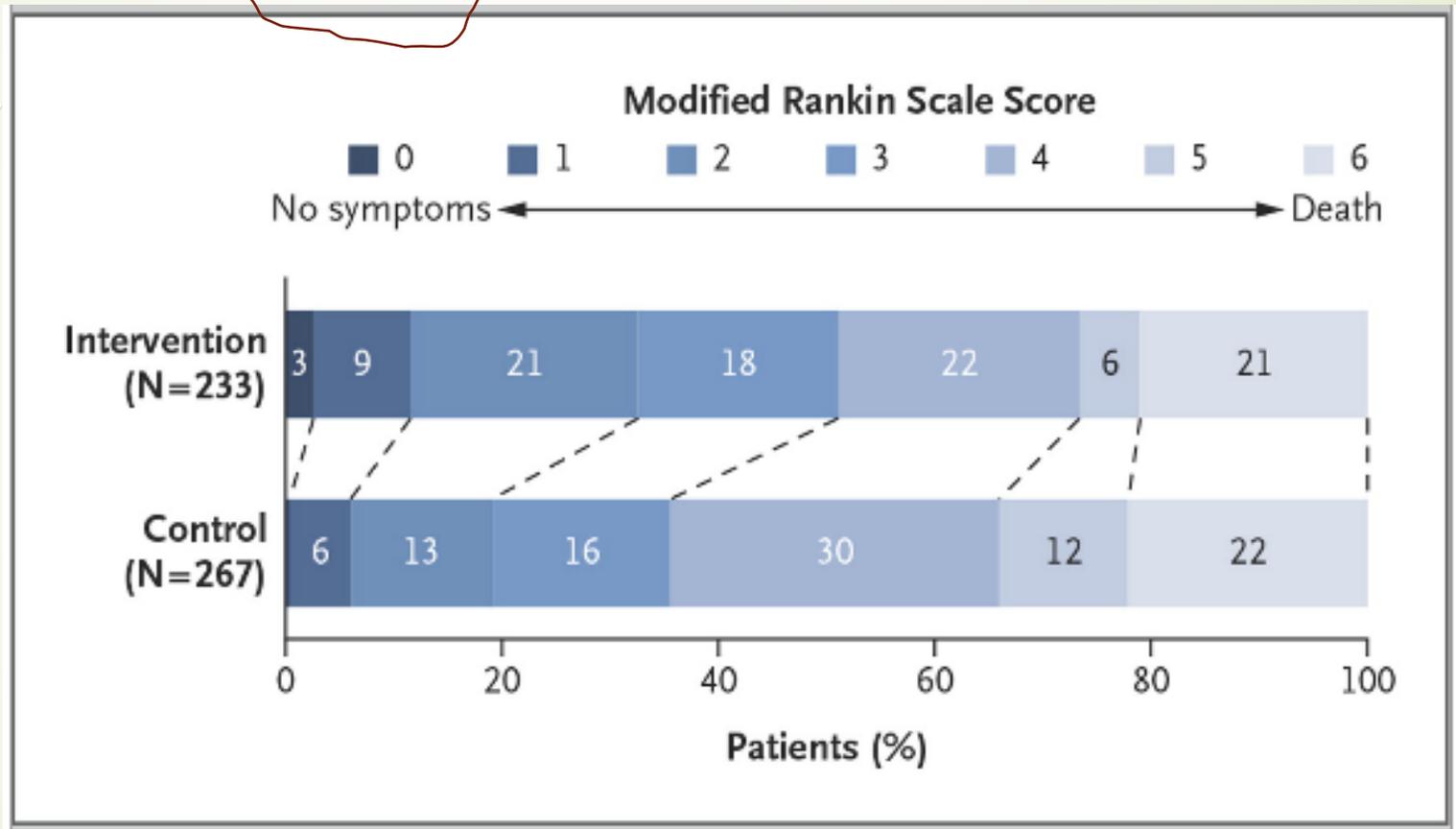
## A Randomized Trial of Intraarterial Treatment for Acute Ischemic Stroke

### CONCLUSIONS

In patients with acute ischemic stroke caused by a proximal intracranial occlusion of the anterior circulation, intraarterial treatment administered within 6 hours after stroke onset was effective and safe. (Funded by the Dutch Heart Foundation and others; MR CLEAN Netherlands Trial Registry number, NTR1804, and Current Controlled Trials number, ISRCTN10888758.)

Proximal anterior arterial circulation  
Could not make 4 hour window for thrombolytic  
All got TPA  
Randomized to intervention or not

## Intention to treat v. Controls



40 pts

Only 85% of the intervention group got an intervention. Low risk pts ?

## SAFETY

There was no significant between-group difference in the occurrence of serious adverse events during the 90-day follow-up period ( $P=0.31$ ) (Table 3). However, 13 of the 233 patients (5.6%) in the intervention group had clinical signs of a new ischemic stroke in a different vascular territory within 90 days, whereas only 1 of the 267 patients (0.4%) in the control group did so. There was no significant difference in mortality at 7, 30, or 90 days of follow-up.



## Stroke Conclusions:

- ▶ Safe and effective
- ▶ Lower stroke volume
- ▶ More open arteries
- ▶ Maybe lower Rankin Scores
- ▶ More secondary strokes
- ▶ More embolization
- ▶ Cost not studied
- ▶ No improvement perception of health
- ▶ Proximal anterior circulation
- ▶ Mystery 40 pts....

# graphs

