# Launching your Research Program: Early Strategies and Benchmarks

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Dean Designate, **Aga Khan University Medical College, Karachi**
President, **Association for Academic Surgery**

# Financial Disclosures

**Current and Former Extramural Funding**

- National Institutes of Health (NIGMS/NIHMD/NIA)
- American College of Surgeons: C. James Carrico Fellowship for the study of Trauma and Critical Care
- Patient Centered Outcomes Research Institute (PCORI)
- Centers for Disease Control (NCIPC)
- Department of Defense/ Henry Jackson Foundation

**Additional Disclosures and Stipends**

- Co-Founder : www.DOCTELLA.com
- JAMA Surgery (Deputy Editor)
- Howard University (Adjunct Faculty)

# Presentation Overview: Things I have learned

1. Find your Passion: Needs to Excite
2. Learn everything : Consider writing a review paper
3. Find/Learn/Develop the Best Methods
4. Apply for Grants: You need resources
5. Collaborate / Go to Works in Progress
6. Don't be afraid to fail- it's ok

**Eq** ine

# Trauma Outcomes Research Group
www.traumaoutcomesresearch.com

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**TRAUMA OUTCOMES RESEARCH GROUP**
*Impacting Policy to Improve Patient Care*

JOHNS HOPKINS
MEDICINE

Introduction | News | Publications | Presentations | Clustermap

**CURRENT NEWS**

Presentation given at the 22nd Annual Scientific Assembly:
Society of Black Academic Surgeons Presentation

Presentation given at the National Press Club in Washington, DC for JAMA:
JAMA Press Conference

**CURRENT MAJOR RESEARCH PROJECTS**

Unconscious Bias and Clinical Decision Making*

Investigating Mechanisms that lead to Disparities in Trauma Outcomes**

Understanding the Basis for Improved Female Survival After Severe Traumatic Injury

Reducing Injuries from Motorcycle/ ATV Crashes

Pre Hospital Procedures and Outcomes

Improving Injury Severity Scoring Systems

We are a Multidisciplinary Group of Trauma Surgeons, Injury Scientists and Social Science Researchers devoted to preventing injuries and improving outcomes after trauma

Our group is based at Johns Hopkins and draws members from the Divisions of Trauma / Acute Care Surgery, Pediatric Trauma, Center for Injury Research and Policy, Welch Center for Prevention and Epidemiology, Hopkins Center for Health Disparities and the Center for Surgery Trials and Outcomes Research. We have a deep collaboration with Center for Surgical Outcomes at Howard University with whom we share fellows and data resources.

The group is led by Dr. Adil Haider, Co Director of the Center for Surgery Trials and Outcomes Research (CSTOR) and an Associate Professor of Surgery, Anesthesiology and Health Policy and Management, at the Johns Hopkins School of Medicine (JHSOM) and Johns Hopkins Bloomberg School of Public Health (JHBSPH). The group is advised by four internationally renowned Mentors/ Senior Collaborators:

Prof Susan Baker- Founding Director Center for Injury Research and Policy- JHBSPH
Prof Edward Cornwell III, MD- Chairperson of Surgery, Howard University
Prof Ellen MacKenzie PhD- Chairperson of Health Policy and Management JHBSPH
Prof Lisa Cooper - Director, Center for Elimination of Cardiovascular Disparities- JHSOM

Major Faculty Collaborators include:

Dr David Efron- Associate Professor and Chief of Trauma, Johns Hopkins Hospital
Dr Elliott Haut- Associate Professor and Trauma Fellowship Director, Johns Hopkins Hospital
Dr Kent Stevens- Assistant Professor of Surgery and Associate Director International Injury Research Unit
Dr Eric Schneider- Research Associate, CSTOR
Dr Wendy Greene- Assistant Professor of Surgery, Howard University
Dr SM Sriram- Chief of Trauma, Howard University Hospital
Dr Renan Castillo- Assistant Professor of Health Policy and Management
Dr Stephen Bowman- Assistant Professor of Health Policy and Management

**UNEQUAL OUTCOMES**

Dr. Haider's quest is to find out why there's a difference in trauma outcomes for minorities. In their research, Haider and colleagues have discovered that African-Americans and Hispanics, as well as the uninsured, are more likely to die after being struck by motor vehicles, even after the severity of the injury is taken into account. Read more.

**OUTCOMES RESEARCH TRAINING**
We strongly promote training in surgical outcomes research. Each year we have two outcomes fellows (one at Howard and one at Hopkins). We are also actively involved in the CSTOR public health student mentoring program. For details click here.
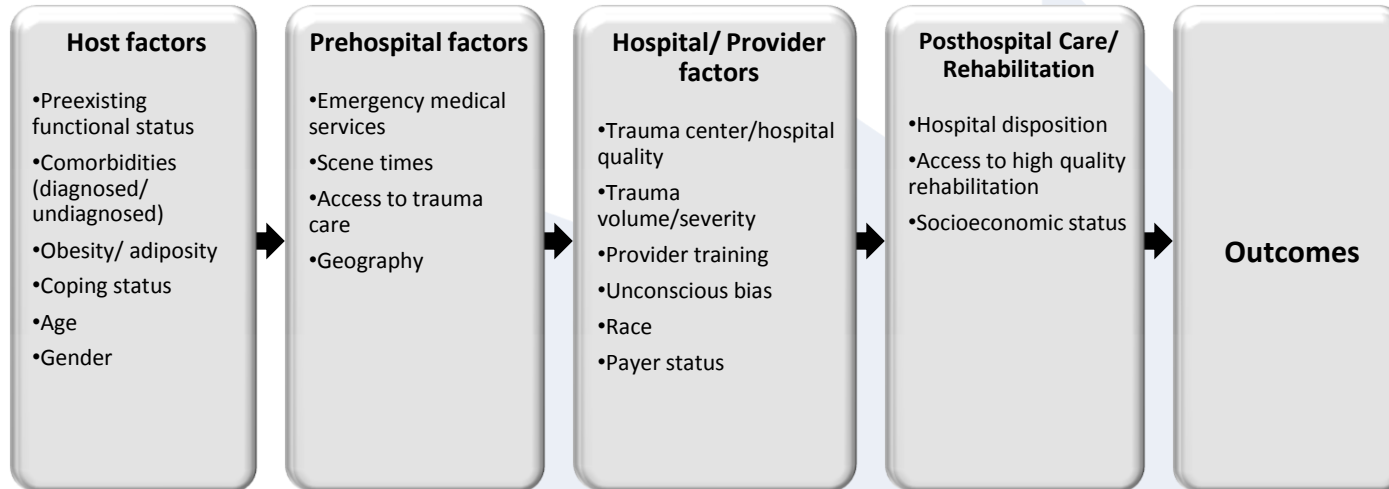
**THE TRAUMA PRIMER: A Collection of articles put together by past trainees on important trauma outcomes research topics.**

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# 2. Consider doing a review



| Host factors | Prehospital factors | Hospital/ Provider factors | Posthospital Care/ Rehabilitation | Outcomes |
|---|---|---|---|---|
| •Preexisting functional status<br>•Comorbidities (diagnosed/ undiagnosed)<br>•Obesity/ adiposity<br>•Coping status<br>•Age<br>•Gender | •Emergency medical services<br>•Scene times<br>•Access to trauma care<br>•Geography | •Trauma center/hospital quality<br>•Trauma volume/severity<br>•Provider training<br>•Unconscious bias<br>•Race<br>•Payer status | •Hospital disposition<br>•Access to high quality rehabilitation<br>•Socioeconomic status | |

Haider AH et al. Disparities in Trauma Care and Outcomes in the United States:  A Systematic Review and Meta-analysis.
*J Trauma Acute Care Surg.* 2013

# 3. Use State of the Art Scientific Methods

- **Find Them**
  - Lots of Experts Around your University
- **Learn Them**
  - Take a class / do a degree
- **Develop / Adapt Them**
  - Specificity Matters
- **Use Them**
  - Will get your work noticed!
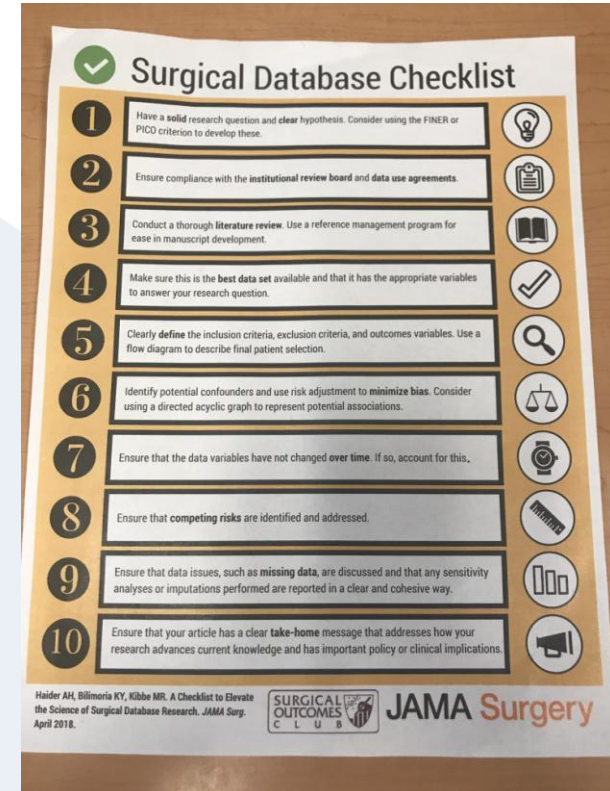
- National database
- Managed by American College of Surgeons
- Voluntary participation
- Data improved > 2007
- Greater than 4 million trauma incidents
- > 900 Trauma Hospitals
- 95% of All Level 1 Trauma Centers

# Proportion (%) of missing data in the NTDB by Covariates n = 1,282,166
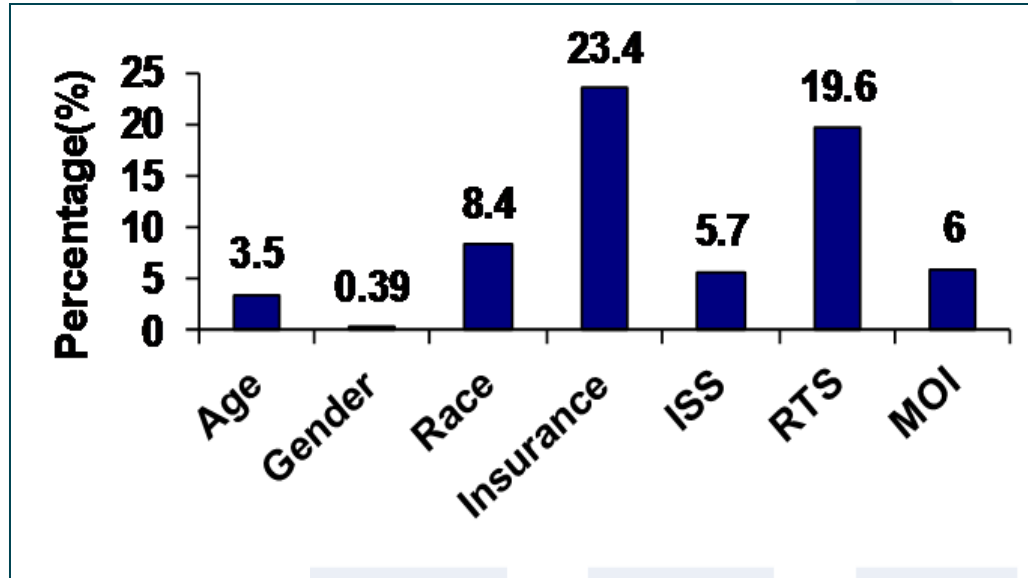
# Multiple Imputation

Derives likely values for data missing at random, based on the conditional probability of observed values

- Data known to be Missing at Random
- No variable more than 20% missing
- Included all co-variates and the outcome, death.

| ID # | Age | Race | Insur-ance | Injury Mechanism | Injury Severity |
|---|---|---|---|---|---|
| 1 | 45 | White | No | Motor Cycle | |
| 2 | 25 | Hispanic | No | Stab Wound | Low |
| 3 | 21 | Black | | Gun Shot | High |
| 4 | 36 | White | Yes | Motor Vehicle | High |
| 5 | 64 | White | Yes | Fall | Low |

# based on observations from the same data set

| ID # | Age | Race | Insur-ance | Injury Mechanism | Injury Severity |
|------|-----|------|------------|------------------|-----------------|
| 1 | 45 | White | No | Motor Cycle | High |
| 2 | 25 | Hispanic | No | Stab Wound | Low |
| 3 | 21 | Black | No | Gun Shot | High |
| 4 | 36 | White | Yes | Motor Vehicle | High |
| 5 | 64 | White | Yes | Fall | Low |

# Multiple Imputation in Trauma Disparity Research[1]

Tolulope A. Oyetunji, M.D.,[*,2] Joseph G. Crompton, M.D.,[†] Imudia D. Ehanire, M.D.,[*] Kent A. Stevens, M.D.,[†]
David T. Efron, M.D.,[†] Elliott R. Haut, M.D.,[†] David C. Chang, Ph.D.,[†] Edward E. Cornwell III, M.D.,[*]
Marie L. Crandall, M.D.,[‡] and Adil H. Haider, M.D.[†]

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Johns Hopkins University School of Medicine, Baltimore, Maryland; and ‡Department of Surgery,
Northwestern University Feinberg School of Medicine, Chicago, Illinois

Submitted for publication January 3, 2010

*Background.* Missing data has remained a major
disparity in trauma outcomes research due to missing
race and insurance data. Multiple imputation (M.IMP)
has been recommended as a solution to deal with this
major drawback.

*Study Design.* Using the National Data Trauma Bank
(NTDB) as an example, a complete dataset was developed
by deleting cases with missing data across variables of
interest. An incomplete dataset was then created from
the complete set using random deletion to simulate the
original NTDB, followed by five M.IMP rounds to generate a final imputed dataset. Identical multivariate
analyses were performed to investigate the effect of
race and insurance on mortality in both datasets.

*Results.* Missing data proportions for known
trauma mortality covariates were as follows: age-4%,
gender-0.4%, race-8%, insurance-17%, injury severity
score-6%, revised trauma score-20%, and trauma type-
3%. The M.IMP dataset results were qualitatively
similar to the original dataset.

*Conclusion.* M.IMP is a feasible tool in NTDB for
handling missing race and insurance data. © 2011
Elsevier Inc. All rights reserved.

*Key Words:* missing data; multiple imputation;
trauma outcomes; disparity; race; insurance.

## INTRODUCTION

Trauma remains one of the leading causes of morbidity and mortality in the United States, affecting
all spectrums of age, gender, and ethnicities. However,

recent articles in the trauma literature have been
highlighting disparities in outcomes based on racial
and insurance differences. With increasing interest
in disparity research, many investigators rely heavily
on administrative databases to answer their questions. The quality of the dataset therefore dictates
the extent of research. Unfortunately, many large datasets are plagued with issues of missing data due to
the retrospective nature of collection. An example of
such is the National Trauma Data Bank (NTDB).
Collected and collated by the American College of Surgeons (ACS), the NTDB is a voluntarily reported dataset from over 700 trauma centers across the United
States and Puerto Rico available for public use in
the study of trauma epidemiology, quality of care,
and patient safety. Although the NTDB is arguably
the most comprehensive reflection of trauma care in
the United States [1], it continues to suffer from this
major limitation of incomplete data. In recent versions
of the NTDB, up to 30% of variables necessary for predicting trauma outcomes were missing or incomplete
[2]. Variables such as race and insurance status,
which are central to the study of disparity in trauma
care, are missing in large proportions. Consequently,
the ACS has attempted to improve the quality of the
data through logical substitution of missing data [1].
Though these improvements to the dataset are important, more sophisticated statistical techniques have
been encouraged to handle missing data [3], and
several statistical strategies have been employed to
address the issue of missing data [3]. Of all
the methods, multiple imputation (M.IMP) combines
a multitude of statistical advantages, produces unbiased results, and sound estimates even with high

# 4. Funding: It's a Philosophy

Historically, we have not pursued this enough

*Comment from a Cardiac Surgeon:*

"I don't have to go ask people for money. I have residents who are willing to do the work and industry folks who are willing to pay for them... Why would I waste my time on begging for money?"

# Funding Sources: Small Money

- Departmental Pilot Grants
- Institutional Pilot or University Awards
- Academic Societies
  - Many are Career Development "Awards"
- Private and Academic Foundations

# Departmental Pilot Grants

- Apply

- Apply again- many are "earned"

- Have the person in-charge review it

*My experience:*

*Received 20K Pilot grant in 2008:*

*"Unconscious Bias among ICU providers"*

# Private and Academic Foundations or Societies

# Find Previous Recipients

- Talk to them
- Politely ask them for advice
- Many may send you their Grant

*My Experience:*

*Dorry Segev sent me his winning application*

# Special Note for Career Awards

- Let them feel like they are adopting you

- Generate enthusiasm about your potential

- Talk about how you have presented at their society meetings

- They need to feel like that you are someone who they would want as their President in 20 years

# Department Letter is Critical

- Adil is an ideal candidate for the Carrico fellowship as he has the appropriate background and qualifications, excellent mentorship and the necessary institutional support.

- The Department Chair and Chief of Trauma, Dr. David Efron will ensure that Dr. Haider has 50% protected time for research and career development activities if he receives this fellowship.

- An explicit plan has already been developed to decrease his clinical load and we have hired new faculty in his division to offload some of his patient care and administrative responsibilities.

# Apply and Apply again

*My Experience:*

*Got it on second try*

REJECTED BY:

- AAST
- EAST
- AAS

# My Attempts to get Bigger Money
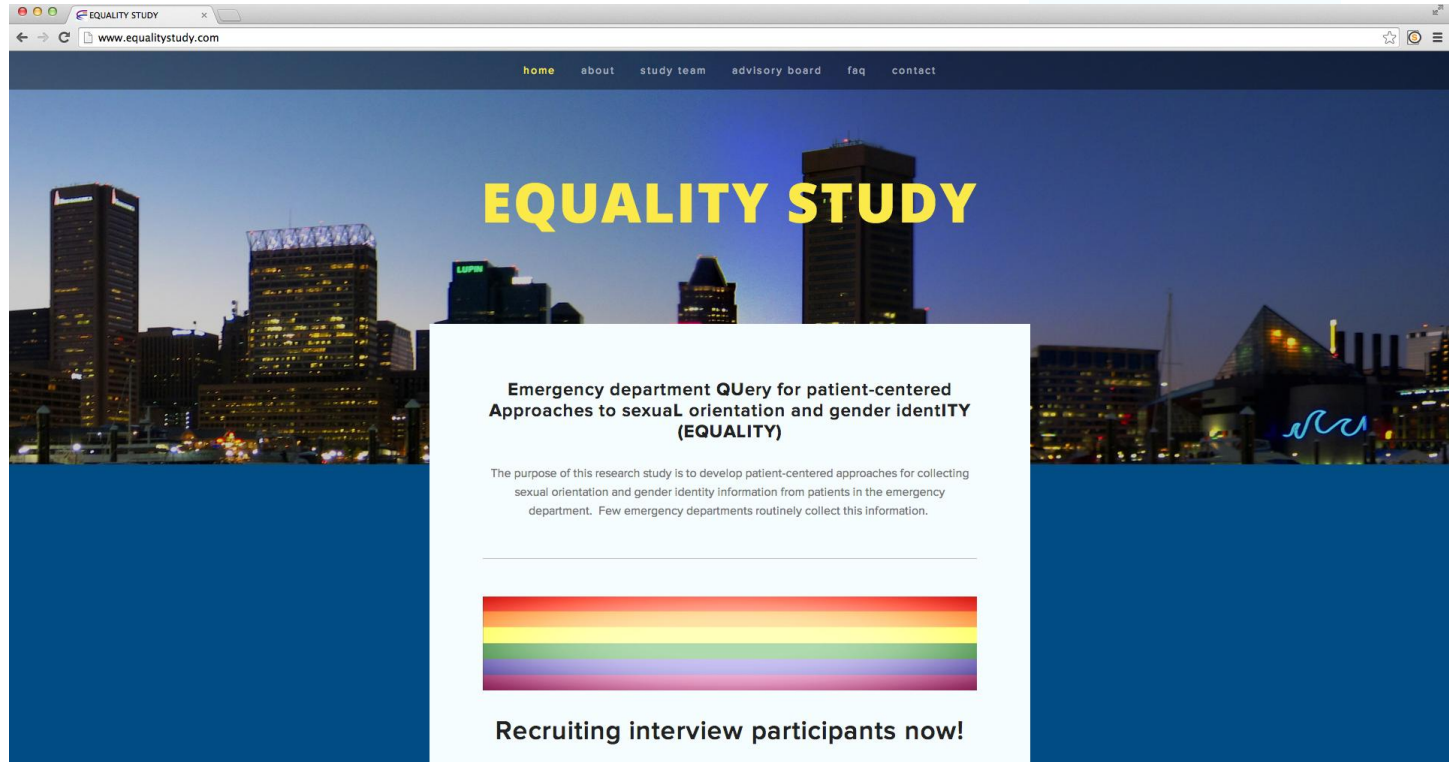
- Submitted an R21- Unscored

- Re-Submitted R21- Scored OK…

- Submitted K23 Career Development Award: "Understanding Mechanisms that Lead to Disparities in Trauma Outcomes"
  BINGO!

# www.equalitystudy.com

# www.equalitystudy.com

EQUALITY
BE COUNTED

AAS
Association for
Academic Surgery

The EQUALITY Study (2014).

www.equalitystudy.com/studymembers/

home    about    study team    advisory board    faq    contact
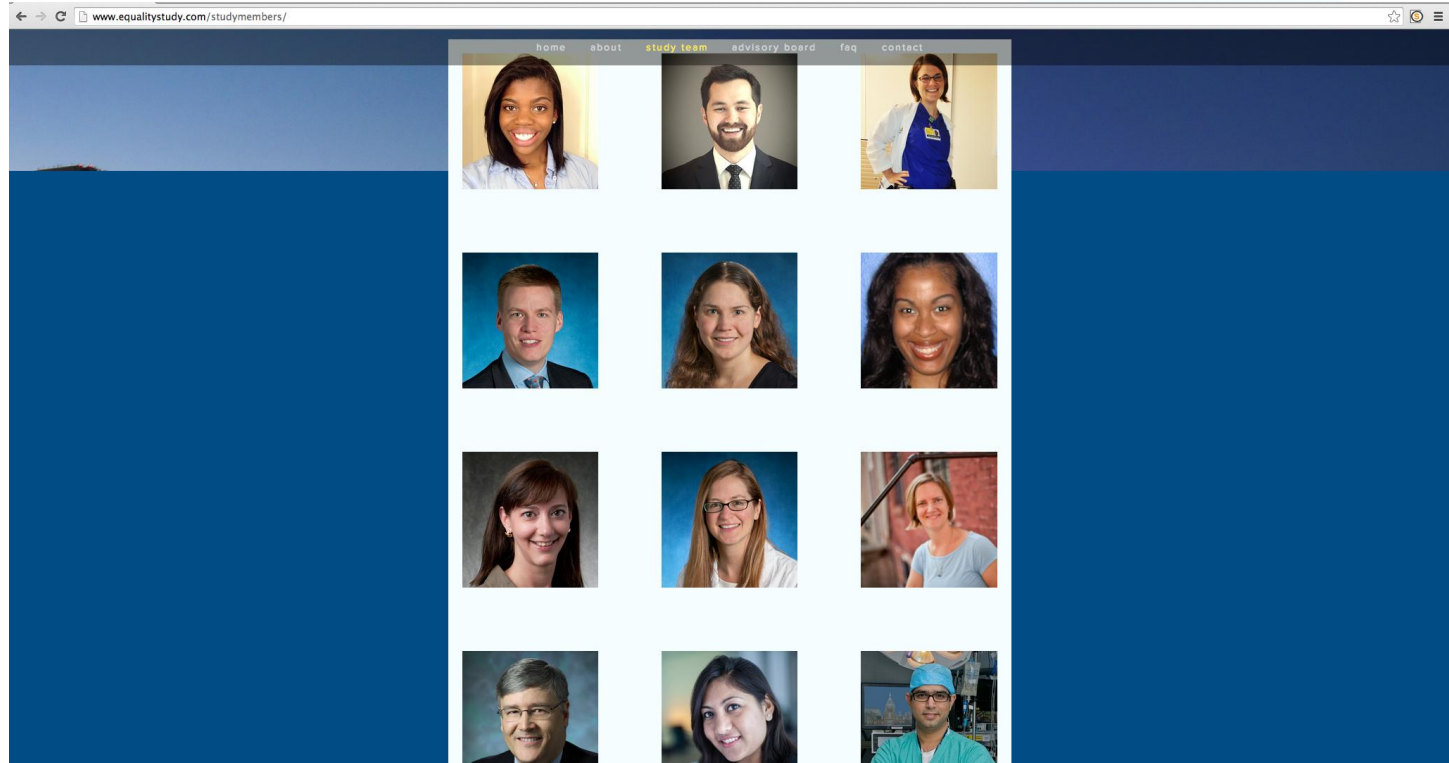
# Trial to Evaluate Cultural Dexterity

- **The PACTS Trial (**1R01MD011685 **)**
- **8 Academic Medical Centers**
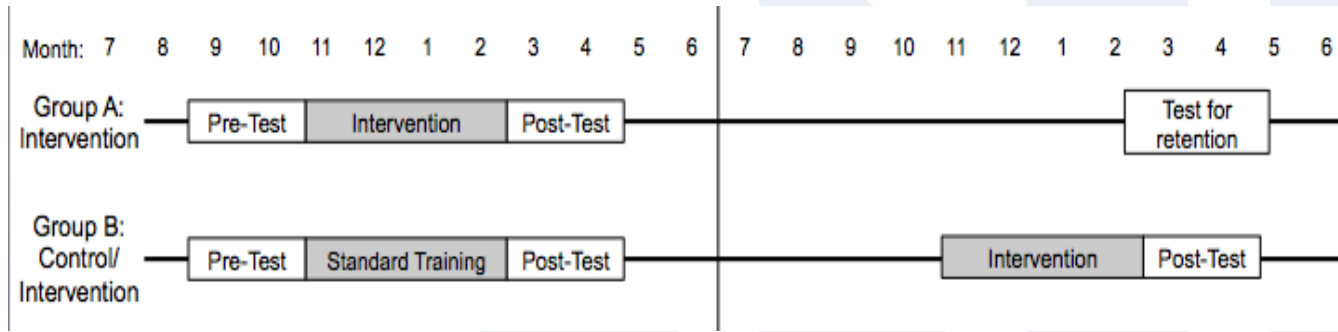


- Outcomes:
  - Residents: knowledge, attitudes, skills
  - Patients: satisfaction, clinical outcomes

# 5. Collaborate and Attend Works in Progress

**Adil Haider** @AdilHaiderMD · Sep 11

We compared number of people wounded / killed during active shooter incidents with or without semiautomatic rifles. Semi-Automatics = 2 X number injured or dead. See @JAMA_current jamanetwork.com/journals/jama/... ... study by @ElzerieDJ @EricGoralnick @JustinCMcCarty et al & @CSPH_BWH team



More people are **killed** and/or **wounded** in Active Shooter Incidents involving Semiautomatic Rifles vs. other firearms

VS.

*comparing Active Shooter Incidents with and without semiautomatic rifles

**5.48** vs. **3.02**
wounded per incident*

**4.25** vs. **2.49**
killed per incident*

De Jager E, Goralnick E, McCarty JC, Hashmi ZG, Jarman MP, Haider AH. Lethality of Civilian Active Shooter Incidents With and Without Semiautomatic Rifles in the United States. JAMA 2018;320(10):1-2.

BRIGHAM HEALTH
BRIGHAM AND WOMEN'S
Center for Surgery and Public Health

HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

JAMA

Gerard Doherty, Emma González, Justin B. Dimick and 7 others

💬 14    ⟲ 102    ♡ 126    ⅰⅼ

# If you can also sit on a methods course…..
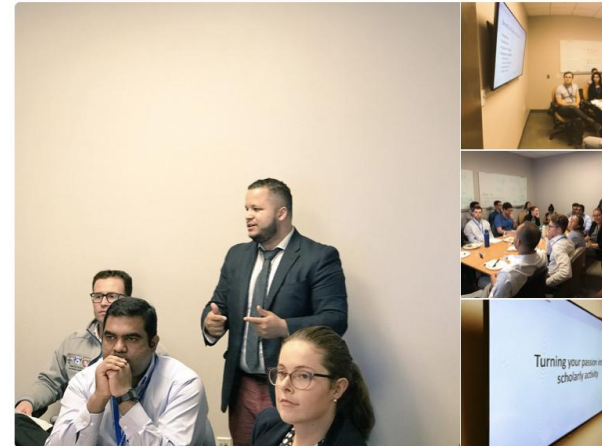
# NOT EVERY ANALYSIS WILL WORK
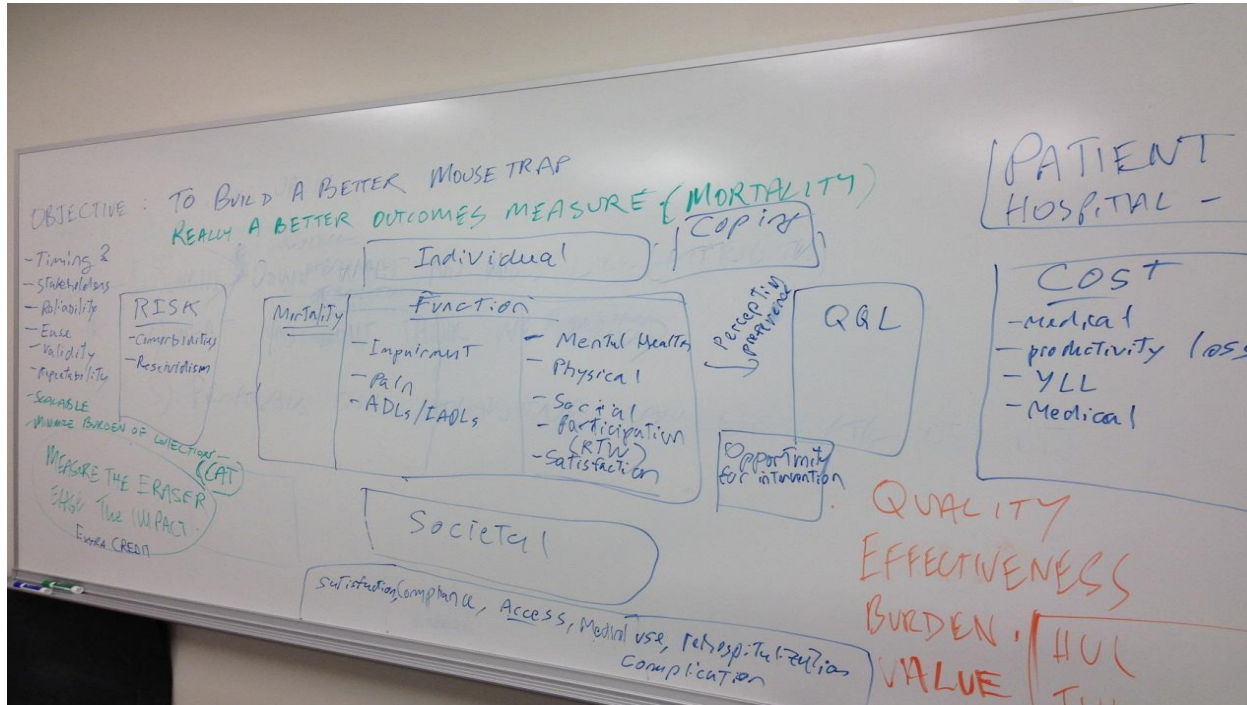
# The Path to Independence

Thank you!
@adilhaiderMD