Lessons from a Novice EMS Researcher

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“I Want to Be a Researcher When I Grow Up…”

◆ “Dabbled” with research as medical student.

◆ Fruitful residency research experience.
  ◆ 4 abstracts
  ◆ 4 original investigations/manuscripts
  ◆ 1 case report
  ◆ 1 national position statement

◆ Strong encouragement from residency program and director.
  ◆ Dedicated “research” and EMS blocks.
  ◆ Reasonable clinical schedule.
  ◆ Strong moral support.
Searched for Research Fellowship

- Recognized need to develop formal skills in research methodology and biostatistics.
  - Fueled by frustration of finding biostatistical/methodological assistance.

- Interested in developing expertise in:
  - Cardiopulmonary resuscitation
  - Emergency Medical Services
“Are you aiming to be a fully-NIH-funded investigator…?”
Research Fellowship
University of Pittsburgh

- Basic science skills (porcine CPR model)
- MPH Courses

Interest and success in clinical EMS research blossomed.
  - Prehospital Airway Collaborative Evaluation, Phase I (PACE I)
Grantsmanship Class

“NIH funding is the Holy Grail of research funding…”

“You are ‘no one’ without NIH funding…”

“People do not take you seriously until you receive NIH funding…”

“NIH funding places you in the ‘big leagues’ of research.”
“K” Career Development Awards

- Easier to obtain than R01’s.
- Easier to obtain as new investigator.
- 5 years, 75% support.
- Improves chances of “first-time” R01 funding.

- Emphasis on training and career development.
- Emphasis on mentorship.

- Important “first step” as an investigator.
The Quest for the “K”

- Agency for Healthcare Research and Quality (AHRQ) “K08” awards in “patient safety.”

- “Isn’t prehospital airway management full of errors?”

- “Can you craft a K08 application focused on prehospital airway management errors?”
  - Important topic.
  - Seemed to fit RFA.
  - Possessed pilot data.
The Quest for the “K”

- “Has anyone in Emergency Medicine successfully obtained a K-award?”
  - A few…

- “Has anyone successfully obtained an EMS-oriented K-award?”
  - No…
K08 Application to AHRQ – Part I

“Reducing Errors in Out-of-Hospital Airway Management”

Specific Aim I:
- Identify and characterize the errors associated with out-of-hospital airway endotracheal intubation.

Specific Aim II:
- Develop a set of clinical decision rules designed to minimize the occurrence of errors in out-of-hospital ETI.

Mentoring Team
- Donald M. Yealy, MD – leading EM researcher
- Joseph P. Costantino, PhD - biostatistician
K08 – Part I – Proposed Training Plan

- Advanced Quantitative Methods:
- Design and Implementation of Out-of-Hospital Multi-Centered Clinical Trials
- EMS Policy, Administration, Practice and Education.
- Research Scholarship and Grantsmanship

“This curriculum may provide a national model for research training proposed by the National EMS Research Agenda.”
K08 Part I

- Score: 266 ("Not fundable")

- NIH scores range from 100 (high) to 500 (low)
  - Usually need <180-200 to be “fundable.”
K08 Part I – Post-Mortem

- Proposed an EMS study, not a HSR study.
  - AHRQ funds “Health Services Research”
  - “Epidemiology and Public Health ≠ HSR.”

  - “Health services research examines how people get access to health care, how much care costs, and what happens to patients as a result of this care.”
  - “The main goals of health services research are to identify the most effective ways to organize, manage, finance, and deliver high quality care; reduce medical errors; and improve patient safety.”
K08 Part I – Post-Mortem

“Research cited does not support need for further study.”

“You need to make a better sell to this audience.”

Did not illuminate prehospital airway management errors in conventional HSR or patient safety terms.

What was obvious to us as EMS researchers was not at all obvious to HSR/patient safety researchers.

Did not “speak” HSR or patient safety language.
K08 Part I – Post-Mortem

- “…experience as mentors of health care delivery research trainees is unclear.”
  - “Training and mentoring relationship not clearly integrated.”

- “The training plan is an EMS research training – not a health services research (HSR) training plan.”
  - “AHRQ is interested in creating health services researchers, not biostatisticians.”
  - “They probably don’t care about the EMS Research Agenda.”
“You had a great proposal for an EMS research study and training plan.”

“It was a lousy proposal for a patient safety/health services research study and training plan.”
K08 Part II – Revised Strategy

❖ New Research Plan
  ❖ Needs to be a Health Service Research study about EMS, not vice-versa.
  ❖ Needs to be a patient safety study about EMS, not vice-versa.

❖ Revised Language
  ❖ Show them that I speak “health service-ese.”
  ❖ Stronger depiction of airway management events as “medical errors.”
Summary of the Repackage

- “HSR is defined as …”

- “EMS is an special (but important) form of HSR.”
  - EMS is profoundly impact by system and access issues.

- Out-of-Hospital Endotracheal Intubation is a Vital yet Error-Prone Procedure
  - Potentially impacts ability to deliver quality health care
    - Resuscitation is an important form of health care.
Summary of the Repackage

 Specific Aim I:
   To determine whether OOH-ETI errors vary with differences in prehospital health care delivery systems (System Factors).

 Specific Aim II:
   To determine the effect of OOH-ETI errors upon in-patient outcome and resource utilization.
Summary of the Repackage

- **Additional Mentors**
  - Judith R. Lave, PhD – Health Economist/Health Services Researcher with extensive AHRQ track record.
  - Carl Sirio, MD – Intensivist with extensive health services research and patient safety track record.
  - “I will learn about patient safety and HSR from leaders in these areas.”

- **Training Plan**
  - Sequence of courses directly related to patient safety and HSR.
K08 Part II – Outcome

- Score: 166 (!)
- FUNDED!
- Possibly the first EMS-related K awarded in NIH/AHRQ history.
Has the K08 Changed My Career?

- National recognition.
- Recognition by non-EM/EMS researchers.
- Protected time.
  - Limited clinical time/distraction.
  - Time for line of work to mature.
    - No immediate need to “follow hot funding opportunities.”
Has the K08 Changed My Career?

- Dramatically improved quality and scope of research.
  - Opened eyes to new approaches.
  - Opened doors to collaboration with researchers from other fields.

- Resulted in unusual but highly productive mentorships.
  - EMS Researcher mentored by a Health Economist???
Lessons Learned
NIH Funding is Sooooo Important

- Brings credibility and recognition.
- Leads to important collaborations.
- Leads to important scientific directions.
- Puts you in the “big leagues.”
- Bridge funding to K may play key role.
  - May take 4-6 years post-fellowship to land a K.
It is Possible to Obtain NIH funding for EMS Research

- NIH Funds Diseases
  - Does not fund EMS.
  - Does fund studies of diseases that happen to involve EMS.
- NIH funds diseases that they are interested in…
  - Must focus applications at NIH priorities.

A study of the EMS management of cardiac arrest

A study of brain function after cardiac arrest – and how it is affected by EMS management
Framing the Proposal

- Importance of problem must be framed in the reviewers’ (and agency’s) perspective.
  - Just because it’s really important in EMS does not mean that it’s important (or obvious) to the rest of the world.

"ETI is performed every day by EMS"  
"Thousands of patients require ETI for respiratory failure – most are performed by EMS"
Collaboration is Key in EMS Research

- The only credible mentor/collaborator on an NIH grant is someone with extensive NIH funding.
  - Few EMS researchers are senior/funded enough in NIH’s eyes.
  - Currently, the most credible mentors/collaborators are in non-EM departments.

- May need to go outside EM/EMS to achieve EMS research goals.
  - Best EMS studies draw from other fields of science and medicine.
Fellowship Training is Mandatory to Succeed as an EMS Researcher

- Research fellowship may be more useful than an EMS fellowship.

- The only opportunity to explore new interests and areas.
  - No such luxury as first-year attending.
  - Lessons require 150% protected time.

- Provides advanced tools needed to excel.
  - Formal knowledge leads to better study ideas and designs.
Don’t Shy Away from Numbers

- EMS crippled by novice-level biostatistics and methodology.

- Success partly due to understanding and working knowledge of (very) advanced biostatistics.

- Good biostatistical help is impossible to find.
  - When you find it, it’s really expensive.

- No one will ever know your data as well as you do.
Focus, Focus, Focus . . .

- Avoid temptation to “dabble.”
- Don’t spread too thin . . .

- Pick a single line of investigation and stubbornly stick with it.
  - May take 3-5 years to begin to see results.
  - May take 3-5 years to figure out/describe what it means.
  - May take 3-5 years to obtain NIH funding.
    - Each application process is 9-12 months.
    - Few score on first try.
Institutions Must Be Part of the Commitment

- Research talent is developed – not born.
  - Unrealistic to recruit pre-made talent.
  - Realistic to identify and develop junior talent.

- Long-term investment.
  - May take the 2-6 years post-fellowship to land a K.