


Developing a research career



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A matter well begun, is
already half done

Identifying problems

- Clinical observation
- Subject matter expertise, reviews, analysis and reports
- Requests for proposals (RFAs, RFPs, Pas), scholarships, conference themes, consensus development meetings and publications
- Colleagues, students (particularly postgraduate students), other health care workers
- General public
- Internet

Identifying problems?

- Tips

- Look for problems systematically
- Look for problems at all times
- Explore your environment

Identifying problems



- Keep your mind open to understand what is going on around you
- Be willing to question
- Capture ideas that come to you quickly – a jotting, voice recording (most cell phones have voice memos), etc.
- Keep a journal of your ideas, thoughts and activities in a log book

Problems journal

- This journal should be in free hand style and rambling
- It should contain:
 - Interesting questions
 - Problems
 - Possible solutions
 - References to search for, read and annotate
 - Notes and comments on articles and papers you have read
 - Inconsistencies you have observed in your work and textbooks, journals or other people's observations

Defining goals?



- Read thoroughly and comprehensively about the problem you have identified
 - Search databases
 - Journals – HINARI, other online databases of free journals and books
 - Specialty textbooks

Refining problems

- Identify good writings quickly
- Identify the research problem in the article
- Think about the methodology –
 - Design
 - Selection criteria
 - Exclusions
 - Intervention
 - Outcome measures
 - Bias
 - Confounding

Refining problems

- What were the findings
- How did the authors interpret their findings
 - Is the interpretation correct
 - Are there alternative explanations
- Study strengths
- Study limitations and how these limitations affect the result
- What areas of future research is suggested by the authors
- What do you think of the article
- Study the literature cited closely and read some of them yourself

Refining problems

- You should look for writings by:
 - Leaders in the field of interest
 - Journals in the area of interest
 - Work done on the topic of interest in your environment
- Communicate with other workers in the field of interest
 - Locally
 - Internationally
- Remain current by subscribing to journals, e-mail alerts, RFA notices and Program announcements, attending meetings and conferences, etc

Defining problems

- From time to time, go over your research journal
 - You may notice that many of the ideas that you have been resolved
 - Some are connected to each other
 - Some require more resources than you currently have
 - Others require more infrastructure – including preliminary research
 - Some you can do right now

Project input

- Preliminary investments
 - From salary, left-over funds from previous research, travel grants, gifts, etc
 - Subscribe to journals
 - Attend conferences with specific purposes in mind
 - Learn the latest about your research area
 - Meet leaders in the field
 - Network
 - Seek support, mentors and funding opportunities

Project input

- Read about how to solve problems scientifically. This requires more than passing knowledge of research methods:
 - Qualitative – ethnography, case studies, key informant interviews
 - Quantitative – experimental and observational methods
 - Bench work – including, cell culture, use of animal models, *in-silico*, bioinformatics,
 - Animal research

Project input

- Read or attend training programs on
 - Research methods
 - Good Practices, for example GCP (Good clinical practice) and GLP (Good laboratory practice)
 - Statistics – elementary to intermediate level including knowledge of probabilities, sampling, sample size, power, modeling and regression analysis
 - Ethics, for example, see <http://www.westafricanbioethics.net>
 - Computer skills, word processing, presentation software, database creation and management, graphs and chart tools

Project input

- Be organized, everybody has the same number of hours within one day
- Protect and manage your time – be very strict about this
- Manage your staff – finding good people can be **EXTREMELY** difficult, keeping them is even harder. Ensure buy-in, shared vision, sense of doing something important
- Hold lab meetings
- Provide training opportunities for staff
- Provide incentives and opportunities for career advancement

Setting goals

- All research involves a tradeoff between practicality and rigor
 - It is HIGHLY UNLIKELY that routinely collected medical information alone will be sufficient for substantial research
 - They may help you identify interesting groups, control populations or provide information that can be added to your planned study
- Develop many ideas simultaneously
- Have a timeline
- Ethical considerations
- Cooperation and collaboration
- Costs

Your enemies



- Self pity
 - Others are having an easier time, less rigorous promotion requirements, more money, etc. Remember YOU VOLUNTEERED FOR THIS! When you applied to be a lecturer!
- Competing interests
 - Legitimate – family, clinical services, lectures
 - Illegitimate
- Perfectionism
 - No research is ever perfect, that is why the rest of us can get something to do
- Procrastination
 - Usually based on fear, of failure, sometimes of success
- Feeling of isolation

Your friends

- Self confidence that comes from regular feedback and acknowledgement – from mentor, peers, conference proceedings, presentations and publications
- Accountability – to your self, funding agencies, institutions, society
- Multitasking and prioritizing
- Focus
- A social and an academic mentor
- Other researchers – who share your pain and joy!

Dangers



- Hubris
- Plagiarism
- Skepticism
- Overwhelm
- Exhaustion
- Despair

Examples of projects

- Extension of the work of others. All research need to be extended to new contexts. Science grows in aliquots!
- Replication of the work of others
 - Is the problem the same here compared to another country, region or continent?
 - Is the problem the same now compared to 10 years ago?
- Checking for similarities – for example X occurs in Y diseases, does it also occur in Z?
- Finding loopholes in previous studies
- Skepticism about “conventional” wisdom or previous research.

Examples of projects

- Tackle 1 year's supply of a few journals in your field of interest
- Journal grazing
 - Is the topic interesting
 - Is the study relevant here
 - Are there local contexts that you KNOW will invalidate the authors' conclusions if such a study were to be replicated here
 - Is there a different patient group or characteristic to which the study may be applied

Examples of projects

- Can I extend the method?
 - New assay
 - New biomarkers
 - New statistical methods
- What are the authors suggestions for future research
- Dig deeper
 - Read the references
 - Contact the authors