How To Build a Research Program From the Ground Up: Strategies and Considerations

Peter Rock, MD, MBA, FCCM
Martin Helrich Professor and Chair
Department of Anesthesiology
University of Maryland School of Medicine
Baltimore, Maryland

There Is No One Formula To Building A Research Program

- If you've seen one research program get built, you've seen one program…
- I've kept a list of the various decisions, tradeoffs and other considerations I've encountered along the way

Strategy And Vision

- Endpoint is a department that has:
  - A culture that values research and scholarly activity
  - Research that makes important contributions to the specialty
  - Faculty who are recognized as leaders in the field by virtue of their research contributions
- Achieving this goal will probably entail a combination of strategies:
  - Recruitment of funded investigators (faster)
  - Training young physician-scientists and PhD researchers (slower)
    - Perhaps decades
    - But has big impact on our specialty: developing and exporting the leaders of our specialty

Strategy And Vision

- These two strategies are not mutually exclusive
- However, since the "home-grown" approach takes time, it would be wise to start this process early
- Recruitment of funded investigators should take into account the development needs of the faculty being trained (research theme)
- The "home-grown" approach also requires suitable junior faculty or trainees and individuals to mentor them

Are Faculty Interested In Research?

- Are faculty interested and committed to engaging in research?
- I brought involvement in several large, multicenter, NIH trials:
  - Thought this would be an easy(er) way for clinician-educators to begin participate in research
  - "Modest" interest amongst existing faculty
- Existing faculty may have limited or no experience with research, may not be interested
- Changing the culture to support and value research will take time, new recruits

Money

- A successful research program is expensive
- Lose money on research; don't make it up on volume
- Some grants require more protected time than the grant actually supports (e.g. K award)
- The more successful you are, the more it costs
  - Equipment
  - Service contracts
  - Cost-share for scientists
- At Maryland, funding expectations for PhDs are:
  - Assistant professors fund 50% of salary to NIH cap ($185,100)
  - Associate professors 75%
  - Professors 80 - 85%
- What is the expectation for a physician-scientist?

Sources Of Funding For Research

- Grants do not fund all research-associated expenses
- Chair's startup package
- Is it feasible to use clinical $ to support research?
- Endowment
- DOD, Foundations, AHA, ATS, etc.

Return Of Indirect Funds To The Department

- This is an important topic to negotiate with your Dean:
  - Know the amount (percentage) of indirect funds retained by the School/institution and that returned to the department
  - May be able to negotiate an increased amount of indirects be returned to the department as an incentive to obtain funding

DOD And VA Funding

- This may be very site specific
- Significant amount of DOD funding available for shock, hemorrhagic shock, prediction of need for transfusion and other life-saving interventions
- DOD funding is not constrained by the NIH cap
- If you are affiliated with the VA, that agency can be another good source of federal funding
  - The VA does not provide the same amount of indirects that the NIH does so the Dean may not like it (as much) but VA awards pay for salary and provide space

Does Research Have To Relate To "Anesthesia?"

- Play to your strengths
- Maryland sees lots of TBI (Shock Trauma, CNS injury transported to Maryland) which allows us to have basic, translational and clinical research in TBI
- Research should probably connect to areas of interest to anesthesiologists
  - Shock, sepsis, cardiac, pulmonary, neuro, pharmacology
  - Perioperative outcomes
  - Basic mechanisms of anesthetic action

Selection Of Your Key (First) Research Faculty Member Is Critical

- Hold out for a (well)funded investigator with a history of R01 renewals
- That person will set the tone for subsequent recruitments or internal development of researchers

"Rainmaker" Researchers: Be Careful What You Wish For

- "Rainmakers" have a significant amount of leverage
- Diversify your research portfolio to minimize your exposure to the risk of your rainmaker leaving

Collaboration With Other Departments

- Partner with funded researchers in other departments
- Opportunities to place junior faculty in labs
  - They have the labs space, equipment, supplies
  - We provide the protected time
- NIH multiple-PI grants
  - "…encourage interdisciplinary and team approaches to biomedical research, and give scientists the option to apply with their peers and allow for equal credit for leadership of the research program."

Investigator Initiated Vs. Industry Trials

- We've avoided them:
  - Rarely result in publications
  - Little to no input into protocol
  - Can you make money?
- It is easy to lose money even on industry trials; they must completely cover all costs and a realistic amount of coordinator and PI effort
- Could be used to help faculty get involved in clinical research
- Might allow you to fund a research coordinator and hopefully the coordinator could work on other projects

PhDs Vs. Physician Scientists

- A group of PhDs can be a good way to start and establish the department's credibility in research
- Developing a critical mass of research faculty makes the department attractive for further recruitment and development of research faculty
- Physician scientists help engage clinical faculty, serve as role models and mentors to clinician-educators

PhDs Vs. Physician Scientists

	PhD	Physician-Scientist
Cost	Less expensive	More expensive
ROI	Faster return on investment	Slower return
Need for training	Less or none	Some or a significant amount
Impact on clinical faculty	None	Significant
Type of research	Basic, mechanisms	Translational, clinical
"Role model"	For other PhD faculty	Relevant to clinical faculty
Integration into department	Less integrated	More integrated
Establish credibility	Faster	Slower
Achieve "critical mass"	Faster	Slower
Change culture	Some impact	Significant impact
Establish training system	Maybe	Yes (T32, K08)
Train future leaders of specialty	Maybe	Yes

Cohesiveness Between PhDs And Clinicians

- A group of research-intensive faculty may not be well integrated into the overall fabric of the department
- We've tried faculty research meetings to share results and ideas
- Seed grants that encourage basic scientists and clinicians to collaborate

Recruit Vs. "Grow Your Own"

	Recruit	Develop Your Own
Speed	Faster	Slower
Cost (Investment)	Expensive	Depends
Integration into department	Slower, more superficial	Faster, deeper
Training requirements	None	Significant
Space requirements	Significant	Embed in existing lab
Track Record	Proven	None or unknown
Risk	Lower	Higher

Selective Faculty Recruitment And Selective Investment In Faculty

- In a recruit, continuous funding, especially federal, as well as an excellent track record of publication, is essential
  - Form a search committee of senior investigators, use other department's faculty, if needed, to advise you
- Invest in faculty who are willing to commit the time and make sacrifices
  - At Maryland, a faculty member seeking protected time contributes half the cost of their protected time; they are investing in themselves (and the department is investing in them)

Establish A Farm-System

- Identify interested medical students or residents and put them in a development program
  - Virginia Apgar Society at Columbia and other similar programs
  - Stipend during residency and fellowship
  - Combined research and clinical fellowship
  - Stay on as junior faculty
  - Strong mentoring, placement in a successful lab

Mentoring

- Critical for the development of junior and middle level research faculty
- Maryland has a Mentoring and Faculty Development Steering Committee; oversees individual committees
- Mentoring committees are established for <u>all</u> faculty seeking promotion and who conduct research
  - ~ 3 faculty mentors per committee
  - Established, successful, funded senior faculty
  - May be internal or external to the department
  - Meet with the mentee at least 2 times/year
  - Review publication progress, grant submissions, specific aims

Departmental Seed Grants

- Attempt to encourage research amongst clinical faculty
- Project must lead to a publication, awardee must provide progress reports back to department
- Process:
  - Call for grants
  - Brief letter of intent describing the project (pre-proposal)
  - Projects invited for a full proposal
  - Committee scores proposals
  - 2-4/yr; $10k each

What Kind Of Research?

- Basic vs. translational vs clinical research
- Depends on the type of your research faculty
- Translational and clinical research more likely to engage clinical faculty
- Play to your department's and institution's strengths and available resources
- Focus department's research efforts on a few areas to create depth rather than many areas of research which have only 1 investigator

Should Anyone Be Allowed To Do "Research" On Anything?

- Will research coordinator effort be required?
- Is faculty member asking for (more) non-clinical time?
- Is the project a one-off, is there a theme that can be developed, or is it aligned with existing research?
- Can the project be published?
- Ask faculty member to invest in themselves by demonstrating they can deliver before assigning academic time

Have Faculty Take Ownership Over Clinical Protocols

- Some faculty have the idea that their role is to think of a project and the research coordinator does the rest
- We require faculty to:
  - Develop the protocol
  - Write the consent
  - Determine the number of subjects
  - Have a preliminary statistical plan
  - Submit the protocol into our IRB system (Cicero)
- We want them to be fully knowledgeable about and accountable for their own study

Does Everyone Get Research Coordinator Support?

- Prioritization:
  - NIH-funded
  - Other federal funded
  - Foundation or Society funded
  - Industry (must completely cover coordinator effort)
- Research coordinator:
  - May assist with recruitment, screening, enrollment
  - Is available as a regulatory and IRB resource
  - Insures regulatory binders, documents are maintained
  - Liaison with the IRB
  - Assists with site visits
  - Helps with budgeting (Office of Sponsored Research)

Should (Funded) Physician Scientists Be Paid The Same As Clinicians?

- We believe they should
- They are performing an important mission which others cannot or will not do
- Clinical faculty may not like the protected time research faculty receive or that they are not as "clinically productive" as others

Benchmarking

	Department 1	Department 2	Department 3
NIH funding (Blue Ridge)	9	4	20
T32 training grant	Yes	No	No
K08 (Physician-Scientist Career)	Yes	No	Yes
Anesthesiologist Investigators (Federal-funded)	18 (6)	9 (2)	6 (2)
Publications (2015-16)	300	200	225
Annual Society Meeting Presentations (ASA/AUA/IARS etc.)	+++	+	++

Alternatives To A Big Federally-Funded Research Program

- Quality and safety research
- Health policy research
- Clinical data:
  - Invest in Database analyst who can query Epic, AIMS, EMR
  - Use your OR clinical info system to create an IRB-approved "Registry" to conduct research