Overview

• Why do research?
  - Why do research during residency?
• What is the Physician Scientist Training Program (PSTP)?
• What’s the timeline?
• How do I find a faculty mentor(s)?
• How do I get funded?
• What are important upcoming events?
• Where can I get more information?
What’s the value of research to patients and surgery?

- The medical profession is defined by curiosity, critical thinking, and humanitarianism
- Research leads to advancements in mechanisms of disease and the translation of these advancements to patients
- Research allows for rigorous evaluation of current practices and for quality improvement
- Surgery has always been a research-driven and evidence-based field
  - History is replete with surgeons who have transformed the practice of medicine
## Surgeon-scientists who have won Nobel Prizes

<table>
<thead>
<tr>
<th>Surgeons</th>
<th>Country</th>
<th>Year</th>
<th>Accomplishments</th>
</tr>
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<tbody>
<tr>
<td>Theodore Kocher</td>
<td>Switzerland</td>
<td>1909</td>
<td>Physiology, pathology, and surgery of the thyroid</td>
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<tr>
<td>Alexis Carrell</td>
<td>USA/France</td>
<td>1912</td>
<td>Vascular suture, transplantation of blood vessels and organs</td>
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<td>Sir Frederick Banting</td>
<td>Canada</td>
<td>1923</td>
<td>Insulin</td>
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<tr>
<td>Werner Forssmann</td>
<td>Germany</td>
<td>1966</td>
<td>Heart catheterization</td>
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<tr>
<td>Charles Huggins</td>
<td>USA</td>
<td>1956</td>
<td>Hormonal treatment of prostate cancer</td>
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<tr>
<td>Joseph Murray</td>
<td>USA</td>
<td>1990</td>
<td>Organ transplantation</td>
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</tbody>
</table>
Examples of recent research accomplishments in surgery

- Cardiopulmonary bypass and cardiac surgery
- Endovascular surgery

1991

TODAY
Stanley Dudrick and “Stinky”
SURGICAL RESIDENT

Jonathan Rhoads
(University of Pennsylvania)

Harry Vars
Other examples of recent research accomplishments in surgery

- Effect of hormones on cancer
- Minimally invasive surgery (first lap chole – 1985; first robotic-assisted aortic surgery - 2006)
- Fetal surgery
- Extracorporeal gas exchange
- Immune therapy for cancer

... and the list goes on and on!!
Why do research during residency?

- Residency is a time to explore personal and professional interests
  - Intellectual curiosity
  - Explore potential career options within academia or a subspecialty
  - Complete a program requirement
  - Develop CV or other credentials

- **Structured** research training during residency enhances scholarly success and leads to a greater appreciation for evidence-based medicine
  - Absence of a research curriculum is a barrier to completion of research projects

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What is the Physician Scientist Training Program (PSTP)?

- The Physician-Scientist Training Program (PSTP) experience is designed to facilitate the development of surgical residents into clinician-investigators
  - Name given to the pathway that combines research training with clinical training
  - For most surgery residents, this means 5 years of residency + 2 years of research

- According to the 2014 NIH Physician-Scientist Workforce Report, physician-scientists are becoming an endangered species!

- In the DOS, we hope that all PSTP scholars will emerge with the tools and training needed to engage in research at the highest levels
  - PSTP plans are highly individualized!
### What’s the timeline?

<table>
<thead>
<tr>
<th>PGY1</th>
<th>PGY2</th>
<th>PGY3</th>
<th>PGY4</th>
<th>PGY5</th>
<th>PGY6</th>
<th>PGY7</th>
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<tr>
<td><strong>Preparatory phase</strong></td>
<td><strong>Investigation and synthesis phase</strong></td>
<td><strong>Reflection phase</strong></td>
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<tr>
<td>• Brainstorm research/personal/professional interests</td>
<td>• Solidify research project(s)</td>
<td>• PSTP (“Research years”)</td>
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<td>• Identify mentor(s) and funding opportunities</td>
<td>• Apply for funding</td>
<td>• Set goals for research projects</td>
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<tr>
<td>• Discuss your ideas with other people</td>
<td>• Obtain regulatory approvals</td>
<td>• Collect and analyze data</td>
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<tr>
<td>• Identify institutional resources</td>
<td>• QI projects</td>
<td>• Submit abstracts to meetings</td>
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<tr>
<td>• QI projects</td>
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<td>• Write and submit manuscripts</td>
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<td></td>
<td>• Get grantwriting experience</td>
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<td></td>
<td></td>
<td>• Review your goals</td>
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<td></td>
<td></td>
<td>• Review what you’ve learned about yourself and your interests</td>
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<td></td>
<td></td>
<td>• Consider the role of research in your career</td>
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<tr>
<td></td>
<td></td>
<td>• Apply for fellowships/jobs</td>
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**Clinical Research Projects, annual William H. Pearce, MD Research Symposium**

**DOS Research Toolkit Lectures by faculty**

**DOS Research Conference (research talks by your peers)**
How do I find a faculty mentor(s)?

• Who or what is a mentor?
  • Not a coach
  • Not a teacher

A mentor is someone who helps you develop your interests and realize your potential

• Mentorship roles are dynamic over time
  - Consider the medical student versus the mid-career surgeon

Slide courtesy of Dr. Andrew Hoel
What can/should a mentor do?

**Tactical**
- Recommend funding opportunities, journals for submission
- Provide funding
- Define research project, review data
- Help refine manuscripts, grant applications, talks
- Sponsor/support/nominate for applications, awards, career development activities
- Help develop timelines
- Support networking and collaboration

**Conceptual**
- Help clarify career and research interests
- Aid in goal setting
- Identify strengths to develop
- Identify weaknesses and areas for improvement
- Challenge you...
How do you find a good mentor?

Start with introspection:
- Know yourself (at least a little bit)
- Know your goals (at least a few of them)

Do your homework:
- Actively seek out mentors you suspect will be receptive to your values, ideas and goals; mentor also needs to have time, expertise, and funding
  - Talk to senior residents, fellows, and peers
  - Set up a meeting to discuss your personal, research, and career interests
- If you don’t “click” with someone, keep looking!
- Professional society resources
  - ACS Young Fellows Association Mentor Program
- Think broadly – you can have > 1 mentor and/or have a mentor outside
  DOS: mentoring TEAM!
DOS faculty research descriptions

https://www.surgery.northwestern.edu/education/residency/resident-research/faculty-mentors-and-research-descriptions.html
Northwestern Scholars is a searchable database of research expertise across all disciplines at Northwestern University. Explore the profiles and research output (publications, visual works, performances, patents, etc.), citations, altmetrics, and grants of thousands of scholars. Learn about core research facilities at Northwestern. Discover the research expertise of Northwestern's wide-ranging schools, departments, institutes, centers, and graduate programs, and view collaboration networks among researchers within Northwestern and with external scholars.

Northwestern Scholars is managed by the Research Analytics unit within the Office for Research at Northwestern University.
FSM websites

• Departments
  https://www.feinberg.northwestern.edu/depts/index.html

• Institutes & Centers
  https://www.feinberg.northwestern.edu/centers/index.html
How do I get funded?

• Broad categories:
  - NIH institutional research training grants
    • DOS: Transplant, Surgical Oncology, Vascular
    • DOM
  - Individual postdoctoral research fellowships (e.g., ACS, NIH F32)
  - Intramural (e.g., Stryker endowment)
  - Mentor

• You need to plan ahead and pay attention to deadlines!

For example: NIH F32 application cycles are 3 times/year

<table>
<thead>
<tr>
<th>Application deadline</th>
<th>Earliest start date for funding</th>
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<tr>
<td>April 8</td>
<td>September of following year</td>
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<tr>
<td>August 8</td>
<td>April of following year</td>
</tr>
<tr>
<td>December 8</td>
<td>July of following year</td>
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</table>
List of funding opportunities + links

https://www.surgery.northwestern.edu/education/residency/resident-research/funding-opportunities.html
What are important upcoming events?

• Thursday, 10/6, 6-8 PM
  - **Resident recruitment dinner** at Francesca’s on Chestnut
  - Faculty and lab residents will talk to PGY1s and 2s about research in small groups
• Thursday, 10/13, 9-10 AM
  - **Training Grant Directors will talk about their programs**
    • Surg Onc – Dr. Seema Khan, Dr. Julie Johnson, Dr. Ryan Merkow
    • ACS Clinical Scholars – Dr. Ryan Merkow
    • Vascular – Dr. Mark Eskandari
    • Transplant – Dr. Daniela Ladner
    • VA CRQS – Dr. Dave Bentrem

• Please sign up for **1:1 meetings with me** – check your email next week to sign up on Google sheet!
Where can I get more information?

- DOS Resident Research website
  https://www.surgery.northwestern.edu/education/residency/resident-research/index.html
  - Current and former PSTP research scholars and projects
  - Faculty mentors
  - Funding opportunities
  - Surgical conferences calendar + abstract deadlines
  - Recordings and slides of Research Toolkit Lectures
  - SURGE-N Newsletters
  - Link to Edelstone-Bendix Day and William H. Pearce, MD Research Symposium
  - Other resources
Names to know

Karen J. Ho, MD
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Rhiannon Weathers
Program Asst
Rhiannon.weathers@nm.org

Help with grant submissions, onboarding,
DOS research event planning, awards administration

DOS Research Conference emails, website updates
QUESTIONS?