AAPM symposium:
Fostering a Successful Career in Research
AAPM 2016

A Research Career in Medical Physics:
From Student to Faculty

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In a nutshell
• When there is a knock at the door, answer it.
• Have the passion & creativity for research
• Work hard
• Don’t sweat the small stuff
• Play nicely in the sandbox
• Involve your family
• Get involved

Who am I? My Career
• Academic medical physicist
  – the A. N. Pritzker Professor at the University of Chicago
  – Radiology, Medical Physics, and the College
• Research
  – Grant-funded lab - CAD, quantitative image analysis, radiomics
  – Ph.D. students, undergrads, post-docs, senior researchers
• Education
  – Teach in our CAMPEP-accredited Ph.D. program
  – Advise graduate, undergrad, medical students...
Who am I? My Career

• Administration
  – Prior Director, CAMPEP-accredited Ph.D. program
  – Chair of Radiology for Basic Science Research
  – Chair and/or member of various university committees, etc.
• Member
  – AAPM, RSNA, SPIE, …
  – National Academy of Engineering
  – Editor-in-Chief, SPIE Journal of Medical Imaging (JMI)
  – Prior President of AAPM
  – Will be the 2017 President-Elect of SPIE

My Life and Medical Physics

• Illinois Benedictine College (1974-1978)
  – Professor Shonka tissue-equivalent plastic (1960’s)
  – Professors Spokas and Meeker – started Exradin company making ion chambers for dosimetry (Standard Imaging, Inc.)
  • Exradin Miniature Shonka Thimble Chamber
  • Exradin Spokas Parallel Plate Chamber

For relative dosimetry scanning and measuring points in water, air, or other phantom material

My Life and Medical Physics

• Illinois Benedictine College (1974-1978)

  – Professor Rose Carney, who had worked on the Manhattan Project
  – Professor of Mathematics at IBC
  – My advisor & mentor in college
  – Many opportunities – teaching HS summer Algebra & at Fermi Lab
My Life and Medical Physics

• **Summers at Fermi National Labs (1976-1978)**
  – Drs. Mike Shea and Bob Goodwin – **beam line diagnostics**
    “Protons are being accelerated through Linac’s nine cavities for the first time at 200 MeV. Here, at the control console, are Robert Goodwin and Mike Shea. (1970)”
  – Dr. Miguel Awschalom – **neutron therapy** center opened in 1976

My Life and Medical Physics

• **University of Exeter, England (1978-1979)**
  – Rotary Fellowship
  – M.Sc. in physics; advisor Vernon Wynn
  – The detection of low frequency rhythms in the electrocardiograms of male and female subjects

My Life and Medical Physics

• **The University of Chicago (1979-1985)**
  – Ph.D. in medical physics: Basic Imaging Properties in Digital radiography
  – Advisor: Kunio Doi – taught me how to do research
My Life and Medical Physics

- **The University of Chicago** (1979-1985)
  - Ph.D. in medical physics: Basic Imaging Properties in Digital radiography
  - Advisor: Kunio Doi – taught me how to do research
  - Additional mentoring from:
    - Franca Kuchnir – balancing professional and personal life
    - Charles E. Metz – finding the passion and theory behind the research

- **The University of Chicago** (1986-present)
  - Assistant Professor to A. N. Pritzker Professor (tenured full professor)
  - Run a federally-funded research lab on CAD/quantitative radiomics
    - Apply for grants constantly
    - Involve senior members of lab in the training and supervision of junior members in the lab.
    - All are “equal” around the research table and learn to ask probing questions
  - Involved in teaching within our CAMPEP-accredited PhD. Program
    - Have 4-6 summer students (HS, undergrads) each year
    - Best “payback” – When a student/trainee becomes a colleague!

- **The University of Chicago** (1986-present)
  - Ask the right questions in the research
    - Connect to the biomedical question
    - Learn from and discuss with program officers at NIH, etc.
    - We are not just doing homework problems
    - Look for “red flags” – there are no answers in the back of the book.
Giger’s Involvement in AAPM

- Commission on Accreditation of Medical Physics Training Programs in 1987-1992
- MEDICAL PHYSICS associate editor 1995-2007
- Program committee as co-director of AAPM annual meeting for 1998 and 1999
- Board Member
- Treasurer
- 2008 President-Elect, 2009 President, and 2010 Chair of the Board
- 2016 Radiomics Track Director

Lessons Learned

- Your field/job should be your passion, not just a job
- Get involved and you will learn
Hopefully you picked a career so that your job is not a job but a passion.

If you like your job, you won’t work a day in your life!

“And to think they pay us to do this!”

Also essential in building a fulfilling career: Balancing personal and professional life

VS.

AND
Building a fulfilling career: Balancing personal and professional life

• It is difficult
• It is possible
• It can be enjoyable
• It can be fulfilling
• It can benefit your family, especially your children

Looking Back
(since I don’t think I realized all of these 25 years ago!)

• The "SWITCH"
• Work hard
• Be creative
• Don’t miss opportunities
• Show that you can get “things” done in an effective and efficient manner
• Share and be nice
• “Pay it forward”
• “Don’t sweat the small stuff”

Looking Back
• The "SWITCH"
  — Early mentor told me that her entire post doc salary went to child care. If you don’t feel comfortable with who is watching your children, how can you work productively?
  — Be glad when your children want to be with the childcare provider
• Work hard
• Be creative
• Don’t miss opportunities
• Show that you can get “things” done in an effective and efficient manner
• Share and be nice
• “Pay it forward”
• “Don’t sweat the small stuff”
Looking Back

- The "SWITCH"
- Work hard
  - Sleep?
    - Grants are written at night
    - School costumes are made at night.
  - Multi task
    - Be creative
    - Don't miss opportunities
    - Show that you can get "things" done in an effective and efficient manner
    - Share and be nice
    - "Pay it forward"
    - "Don't sweat the small stuff"

Looking Back

(since I don't think I realized all of these 25 years ago!)

- The "SWITCH"
- Work hard
- Be creative – in the lab and at home
  - Don't be worried about thinking outside of the box
  - About making changes
  - Keep asking "why?" and "what's next?"
- Don't miss opportunities
- Show that you can get "things" done in an effective and efficient manner
- Share and be nice
- "Pay it forward"
- "Don't sweat the small stuff"

Looking Back

- The "SWITCH"
- Work hard
- Be creative
- Don't miss opportunities
  - Careful what you say no to; You might not be asked again
  - Senior folks – pass a leadership role to a junior person
    - Show that you can get "things" done in an effective and efficient manner
    - Share and be nice
    - "Pay it forward"
    - "Don't sweat the small stuff"
Looking Back

- The "SWITCH"
- Work hard
- Be creative
- Don’t miss opportunities
- Show that you can get “things” done in an effective and efficient manner
  - If you want to get something done, give it to a busy person
  - “Just do it”, "Walk the talk"
  - I tend to be a “behind the scene” person
- Share and be nice
- “Pay it forward”
- “Don’t sweat the small stuff”

Looking Back

- The “SWITCH”
- Work hard
- Be creative
- Don’t miss opportunities
- Show that you can get “things” done in an effective and efficient manner
- Share and be nice
  - Everything I learned, I learned in kindergarten
  - Play nice in the sand box; but also stand up for your rights
  - Keep your door “open” for others
- “Pay it forward”
- “Don’t sweat the small stuff”

Looking Back

- The “SWITCH”
- Work hard
- Be creative
- Don’t miss opportunities
- Show that you can get “things” done in an effective and efficient manner
- Share and be nice
- “Pay it forward”
  - When you mentor/promote a junior person and they say what can they do for you
    - You say – just do the same for some junior person when you are senior
  - Almost everyone in my lab can identify their niche, and ultimately their paper
    - Each takes more pride and ownership in their research
    - The student who does the research gets the first authorship
  - Work gets distributed!
- “Don’t sweat the small stuff”
Looking Back

• Work hard
• Be creative
• Don’t miss opportunities
• Show that you can get “things” done in an effective and efficient manner
• Share and be nice
• “Pay it forward”
• “Don’t sweat the small stuff”
  – Don’t worry about small set backs; keep moving forward
  – Many problems arise purely from a slight miscommunication
  – Worry less
  – Don’t worry about the dust under the couch!
    • It is all about setting priorities

Best Payback

When a student/trainee becomes a colleague!

Family

• Have them understand your job and make them a part of your work life
  – Have them work next to you at home
  – Show them how you work hard & they will learn by example
  – Include them in lab lunches and have lab picnics at your home
  – Bring them to AAPM and other meetings
• Take time off to go to their events
  – Even if you have to drive an hour for an hour-long kindergarten play, and then drive an hour back to work
  – Even if you have to stay up late
  – Be the girl scout leader
    • Also when you are in charge, you get to set the schedule!
• Be there for them