

**Quality in Medical Physics  
from an Academic Perspective**

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**Disclosures**

- No current conflicts
- Previous research and/or travel funding from Varian, Elekta, Siemens, Sun Nuclear, Scanditronix



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**Quality in Medical Physics  
from an Academic Perspective**

- High quality clinical physics service
- Lots of important research
- Many papers and invited presentations
- Be a great teacher for the residents
- Get lots of big grants

OK, next talk!



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### Quality in Medical Physics from an Academic Perspective

- Quality in Clinical Physics
- Research and Research Productivity
- Oh Yes, Teaching!
- Funding, Admin, What Am I Supposed to Work On?
- The Academic Rat Race (Positions, Promotions...)
- Doing New Stuff that Makes Things Better
- Summary



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Quality in Medical Physics from an Academic Perspective

### Quality in Clinical Physics

- The patients must come first ! Everything else will follow
- Physicists mainly exist in the clinic to do problem solving: applying logic to define the problem, and using the scientific method to solve problems
- We are not there to just do QA – we're there to create the QA system, to analyze failures, to improve the processes, and to look beyond the surface to find out what's really going on
- Don't just deal with the immediate issue, look deeper and figure out how to avoid that issue in the future



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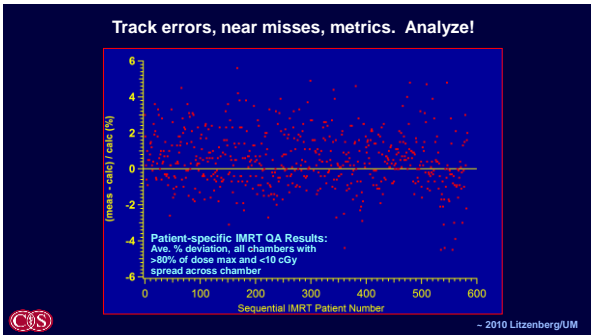
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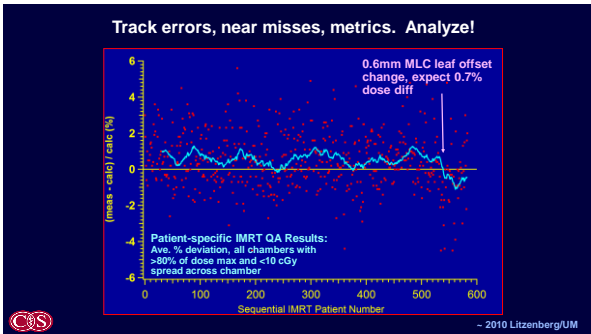
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Quality in Medical Physics from an Academic Perspective

**Quality in Clinical Physics**

Quality clinical physics is not "getting the QA done".

It is going the next step:

- Improving the plan or process,
- Designing a new way to address a problem or need,
- Thinking through a problem logically so the issue can be addressed based on the data (ie, the facts)

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Quality in Medical Physics from an Academic Perspective

### Research and Research Productivity

There are a wide variety of ways to do high quality research:

- Look for the issue(s) which limit the quality or efficiency of the clinical process, or which prevent that next clinical study from testing a new strategy for treatment or evaluation
- Make use of the resources and/or opportunities at your institution
- Combine your clinical and research efforts – it's much easier to spend more quality time on your research work if it's directly aligned with your clinical work
- Do stuff that the physicians are actually interested in – it's pretty hard to talk them into something they don't want to do!




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Quality in Medical Physics from an Academic Perspective

Teaching

- Educational work is crucial – even though it may seem like it's often given lip service (ie, expectation of teaching, but no time/effort really allocated toward it)
- Teaching the medical residents is highly important – especially to the department chair
- Everyone should be teaching staff physicians, dosimetrists, therapists, and there are often graduate students, physics residents, and others
- Make sure you document teaching – that's needed for promotions




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Funding, Admin, What Am I Supposed to Work On?

You should always remember:

- Very few people in a hospital or University understand what Radiation Oncology is
- Only a very small fraction of those people have any idea what a medical physicist is, or what we do.
- Not only do we need to work hard and concentrate on doing high quality medical physics, but we must also remember that we need (continually) to educate people about what medical physics is, and what high quality medical physics is




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Quality in Medical Physics from an Academic Perspective

### Funding, Admin, What Am I Supposed to Work On?

What am I supposed to work on?

You'll often hear "I'm 80% clinical, 20% research, and most of that research time happens after I've already spent 40 hours a week..."

Oh, and I teach the residents too...

How you divide your time and effort is very important



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Quality in Medical Physics from an Academic Perspective

### Funding, Admin, What Am I Supposed to Work On?

There is not one answer to how effort should be spent.

There are almost as many models for how academic medical physicists are funded as there are institutions:

- Hosp vs Academic vs Grant funding
- Tenure vs non-tenure academic vs hospital staff appointments
- Clinical work vs grant-funded research



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Quality in Medical Physics from an Academic Perspective

### Funding, Admin, What Am I Supposed to Work On?

Most places really have 5 types of effort:

- Clinical support: work tied to specific machines, protocols, treatments...
- Administration: managing dosimetrists + other physicists, financial planning and accounting, capital equipment, documentation, ...
- Teaching: residents, therapists, MDs, grad students, physics residents ...
- Research: scientific experiments; hypothesis-driven research, "scholarship" time – preparing grants, papers, talks, aka "Research"
- Clinical development: any activity leading to something new deployed in the clinic.



Joe Deasy, MSKCC

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Quality in Medical Physics from an Academic Perspective

Funding, Admin, What Am I Supposed to Work On?

Clinical Development:

- Any activity leading to something new deployed in the clinic.
- We have to pay the overhead to get new things into the clinic.
- In many cases, what is called research in medical physics is NOT really research, at least in the hypothesis-driven sense.
- Highly speculative development projects are often called 'research'.
- Do not use the 'R' word when 'clinical development' will do.



Joe Deasy, MSKCC

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Funding, Admin, What Am I Supposed to Work On?

How to answer many of the prioritization + concentration questions is really determined by the Chair and the institution:

- If your work priorities align with the expectation of the Dept. Chair, that's a good thing. If not, things don't work as well.
- Aligning the effort splits with the funding of the position makes things much easier. However, the Dept Chair's guidance to the staff and administrators can make a big difference.




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Quality in Medical Physics from an Academic Perspective

### The Academic Rat Race (Positions, Promotions...)

Most academic positions require:

- Some degree of independent contributions to the field
- Publications and presentations
- Letters from outside experts documenting the quality of the academic contributions and work
- Effort contributed to national scientific or educational organizations
- Internal committee contributions




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Quality in Medical Physics from an Academic Perspective

### The Academic Rat Race (Positions, Promotions...)

Ideas to help make you more promotable:

- Collaborate: you'll get more done, other people's skills will help your projects, and being involved in their projects helps you develop, broaden, and mature.
- Volunteer: work in national scientific organizations gets you and your work known, which is crucial when it's time to ask people for letters of support for your promotion. And the work broadens your knowledge base and awareness of all the different ways to do things




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### The Academic Rat Race (Positions, Promotions...)

- You will need letters:
  - You need to do things to get more senior people in the field to recognize and respect your work.
  - I'm not talking about schmoozing. Contribute scientific and organizational work to efforts that they will see and respect.
- Papers and grants:
  - # of papers and grants is not nearly as important as demonstrating leadership in the publications and grants – so people can see what you're capable of contributing




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Quality in Medical Physics from an Academic Perspective

**The Academic Rat Race (Positions, Promotions...)**

- Contributions at your current institution:  
All institutions want/need effort to make the place run, and to provide the oversight and shared effort needed to improve the institution, so contribute time/effort to institution or cancer-center committees and projects.
- Academic productivity in clinical track positions:  
Educational efforts and presentations to lay audiences, outreach to underserved populations, clinical guideline groups, and many other such things are important – not just “basic research”




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Quality in Medical Physics from an Academic Perspective

**The Academic Rat Race (Positions, Promotions...)**

- Expectations of the Dept Chair and institution are crucial:
- If your work priorities align with the expectation of the Dept. Chair, that's great. If not, things don't work as well.
  - The dynamics of the institution and the funding sources are also crucial, and you need to know how to present your efforts so they align with the expectations.




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**Do New Stuff that Makes Things Better**

The answer to "what is quality medical physics" is almost completely summarized by the statement above:

Do new stuff that makes things better:

- Clinical support: don't just fix the immediate issue, look deeper and find a real solution
- Research: create new techniques, help answer new clinical questions
- Education: create new experts
- Improve the institution and the field




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**Summary**

- The patients must come first
- Don't just follow protocols or rules – look deeper
- Develop and study things that will make the next clinical advance possible
- Create the next generation of experts
- Align your effort with the opportunities of your department and institution. Be aware of your surroundings and the expectations from department and institution
- Contribute to the field




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Acknowledgements

A spirited email discussion among the members of Science Council about quality in academic medical physics as we discussed the goals for this symposium.

And the new medical physicists (both experienced and fresh out of residency) that we're in the process of hiring – they've helped me think about how I'd like them to think about their new positions



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