Future Trends in Demand and Supply for Radiation Oncology Physicists – 2018 Revision

A Crisis in the Demand and Supply 2016 – 2030

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What is the General Problem?

- All professions need to be able to plan for the future
- A key aspect of such planning is to project supply and demand
- Accurate projection of supply and demand positions the profession for the future:
  - Oversupply – unemployment, low wages
  - Undersupply - extended working hours, compromise in patient care, poor quality of life

What is the Specific Problem?

- Radiation Oncology Physicists (ROPs) face three major issues:
  - The rate of retirement of ROPs has risen dramatically as the baby boomers retire
  - Cancer incidence grows at ~2% per year, leading to an increase of ~30% by 2030
  - As of 2014, ROPs must have graduated from a residency program accredited by the Commission for the Accreditation of Medical Physics Education Programs (CAMPEP)

Entry into the Profession

- Since Board Certification is required to become a Radiation Oncology Physicist
  - We must have enough residency programs to meet the demand
  - We must graduate enough radiation oncology physics residents to meet the demand
  - The current number of graduating therapy residents is about 140/year

MS/MSc and PhD Graduate Destination – 2016 CAMPEP Report

	2012	2013	2014	2015
MS RT Residency	44 (22%)	37 (23%)	40 (25%)	46 (23%)
PhD RT Residency	24 (30%)	28 (25%)	31 (29%)	44 (47%)

Demand – How many jobs?

- Projected Demand Information Required:
  - Cancer incidence 2006 – 2030 (NCI projection cited by AAMC Center for Workforce Studies)
  - Median new cancer patients treated per Clinical FTE Radiation Oncology Physicist (*Abt IV Study of Medical Physicist Work Values for Radiation Oncology Physics Services*)

Demand - # Jobs? - Assumptions

- One half of all new cancer patients are treated with radiation therapy
- The median number of new cancer patients managed by a FTE Radiation Oncology Physicists was measured as 424 in 1995, 325 in 2002, 304 in 2007, and 225 in 2015
- A working ROP is assumed to spend ¾ time on clinical service. Therefore the ratio of working ROPs to Clinical FTEs is 1.33333

Demand - # Jobs? - Assumptions

- Assume 75% of Full Members of the AAPM are involved in radiation oncology physics service; 69% of these are primarily clinical
- Retiring Therapy Physicists 2016 – 2030 (American Association of Physicists in Medicine membership profile by age, created January 2018) - Since most radiation oncology physicists retire between 65 and 69, for a given year, average the number of individuals between 65 and 69
- The retirement rate was projected between 0.014 and 0.018 for the years 2016 through 2030

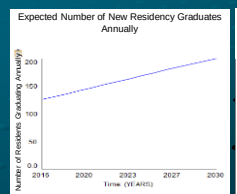
Supply – How many do we make?

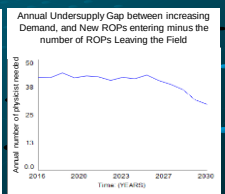
- Projected Supply Information Required:
  - CAMPEP ROPs trained 2000 – 2030 (American Association of Physicists in Medicine)
  - Residency Application and Acceptance Rates based on historical data (CAMPEP e.g. application ~65% MS, ~85% PhD, 100% Certificate and DMP)
  - Projected ROPs passing ABR Board Certification Examination 2016 – 2030 (ABR)
  - Number of Working ROPs 2016 – 2030 (AAPM)

Supply - Model design

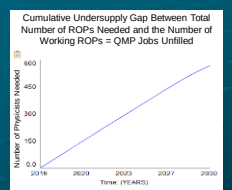
- Model allows for adjustment in:
  - Radiation Oncology Physics Residents entering CAMPEP Accredited Residency Programs grows between 5 and 6 positions per year through 2030
  - Working ROP Retirement Rate between 2008 and 2030
  - Model adjusts retirement rate if different from expected

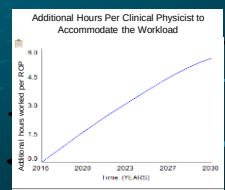
What about 2016-2030?
If we follow current growth trends



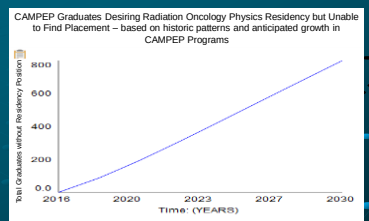


What about 2016 – 2030?
If we continue current trends



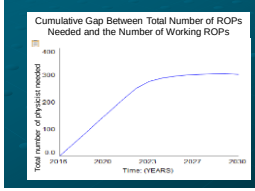


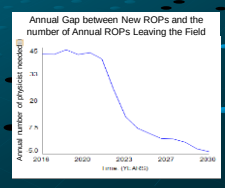
If we follow current trends….



What about 2016-2030?

If we have 200 CAMPEP Residency slots by 2022 versus 160, then growth to 240 slots versus 200 by 2030?





Results and Conclusions

- Current number of CAMPEP Residents must increase from 140 to a minimum of 200 per year by 2022; 160 will not work!
- Then growth must continue to around 240 by 2030 just to head off the growth in demand leaving a gap of 300 unfilled positions
- Times are indeed challenging for the Radiation Oncology Physics Community!

Better Questions

- If we are unable to make enough ROPs, and the work week spirals out of control:
  - will more QMPs retire or leave the profession?
  - will this impact patient care negatively?
- What if there is a new technology or employment paradigm? – how might it change this model?
- What about current CAMPEP graduates with no pathway to certification?
- Should Academic programs guarantee a residency slot to a successful graduate?