In Memorium:
Lynn J. Verhey, Ph.D.
Innovator & Educator
1940 - 2017

Career

1964-67:	Ph.D. University of Illinois
1967-70:	UCLA Dep't of Physics
1971-75:	Harvard Dep't of Physics
1975-90:	Harvard Medical School / MGH
1991-2008:	UCSF Radiation Oncology
2008-17:	UCSF Prof. Emeritus

Achievements

- Head, Clinical Physics, MGH Proton Treatment Program, 1978-90
- Vice-Chair and Chief, Medical Physics, UCSF, 1991-2008
- Director of Physics, UCSF Gamma Knife Center, 1991-2008
- Chair, Report Committee on Proton Therapy, ICRU
- Fellow, AAPM, 2002
- Fellow, ASTRO, 2006
- …

Harvard Cyclotron

UCSF

Lynn's Advice to new students, …

- Go to clinic daily – Patient & Chart Rounds
- Be involved in treatment planning – Understand the needs of patients
  - From immobilization through treatment
- Demonstrate the values of physics residents and physics to residents
- Do research: a systematic approach to solve clinical problems
- Become a Giants Fan (not universally accepted!)

Thank you Lynn for all your contributions to Medical Physics and Medical Physicists

Treatment Planning in the Era of Medical Physics 3.0

Bruce Curran, MS, ME, FACR, FAAPM
Associate Professor of Radiation Oncology
Virginia Commonwealth University Health System
Chief Therapy Medical Physicist
HH McGuire VA Medical Center
Richmond, VA

Acknowledgements

- The Medical Physics 3.0 Committee (AAPM)
- The Works of Lynn Verhey

Disclosures

- None

An Informal Poll

1. How many people believe that they are competent Treatment Planners?
2. How many people believe that they are competent Dosimetric Planners?
3. How many people would change their answer to question 1 in light of question 2?

Are Medical Physicists Today unnecessarily Limiting themselves?

- There is the temptation to focus on the practice and mastery of the minimum, with critical thinking and clinical relevance taking a second seat.
- A technically strong physicist can become too detail-oriented in solving narrow physics problems with limited effect towards improving patient care in the larger clinical context.
- In both these cases, medical physicists are limiting themselves to being either compliance technicians or overly rigorous academicians out of touch with clinical realities and constraints.

From: Samei et al. Redefining and Reinvigorating the Role of Physics in Clinical Medicine: A Report from the AAPM Medical Physics 3.0 Ad Hoc Committee. Med Phys 45(xx), 2018.

Medical Physics 3.0 believes that Medical Physicists can do better!

- The broad, profound, and accelerating changes in the delivery of healthcare can be significantly benefited if they can be informed by science, enabled by innovation, and monitored by quantification
- Medical physicists' strong analytical and problem-solving skills, technical expertise, and knowledge of clinical processes have also made them valued contributing members of corresponding clinical services
- The true strength of a physicist is the ability to precisely analyze their environment, detect problems or weaknesses, and create novel solutions.

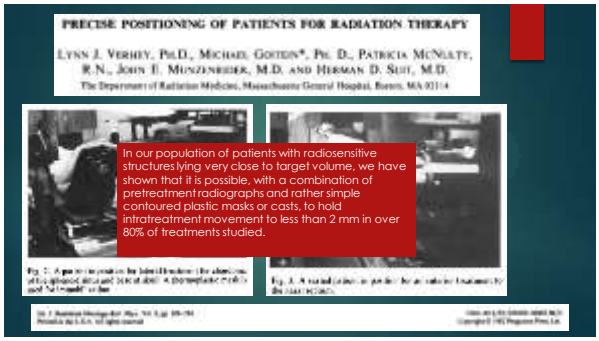
From: Samei et al. Redefining and Reinvigorating the Role of Physics in Clinical Medicine: A Report from the AAPM Medical Physics 3.0 Ad Hoc Committee. Med Phys 45(xx), 2018.

Clinical Medical Physics: Expanding Horizons in the Clinic

- Expand participation in the clinic
  - Be involved in the entire treatment planning process
    - Immobilization
    - Imaging
    - Dosimetric Planning
    - Treatment Delivery
- The Qualified Medical Physicist must be available when necessary for consultation with the radiation oncologist and to provide advice or direction to technical staff when a patient's treatments are being planned or patients are being treated. [ACR-ASTRO Practice Parameter for Radiation Oncology, 2018]

Clinical Medical Physics: Expanding Horizons in the Clinic

- Participate in Peer Review, Chart, and Patient rounds
- Where Contouring Rounds are not present, establish pre-MD review of dosimetric plans for appropriateness with CMDs
- Medical Physicist 'consults' to help educate the patient on their treatments may be a part of our future [Atwood et al, Care for Patients, Not for Charts: A Future for Clinical Medical Physics. Int J Rad Onc Bio Phys, Vol. 100(1), pp 21–22]


PRECISE POSITIONING OF PATIENTS FOR RADIATION THERAPY

LYNN J. VERHEY, PH.D., MICHAEL GOITEIN*, PH. D., PATRICIA MCNULTY, R.N., JOHN E. MUNZENRIDER, M.D. AND HERMAN D. SUIT, M.D.

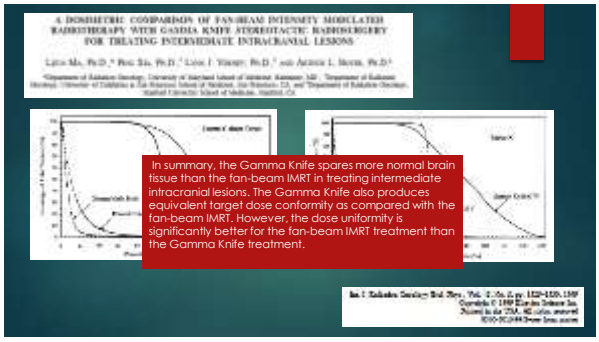
In our population of patients with radiosensitive structures lying very close to target volume, we have shown that it is possible, with a combination of pretreatment radiographs and rather simple contoured plastic masks or casts, to hold intratreatment movement to less than 2 mm in over 80% of treatments studied.

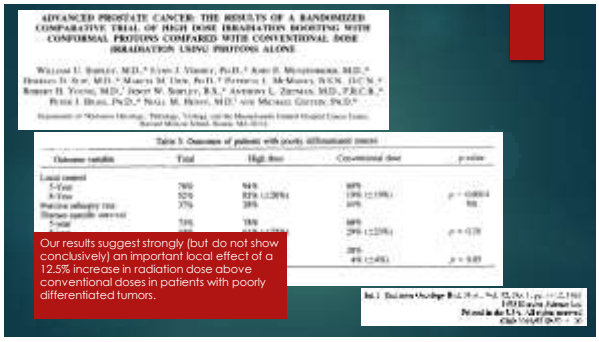
Clinical Medical Physics: Demonstrating its Value

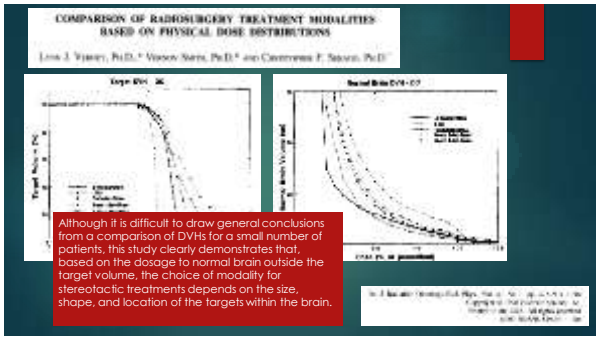
- Medical Physicists can perform a valuable role in Practice Quality Improvement (PQI) projects and Outcomes Evaluation, both integral to clinical practice
- These activities are required for accreditation by most certifying bodies (ACR, ASTRO) and should involve all aspects of patient treatment

Medical Physics Involvement in such studies can take many Aspects

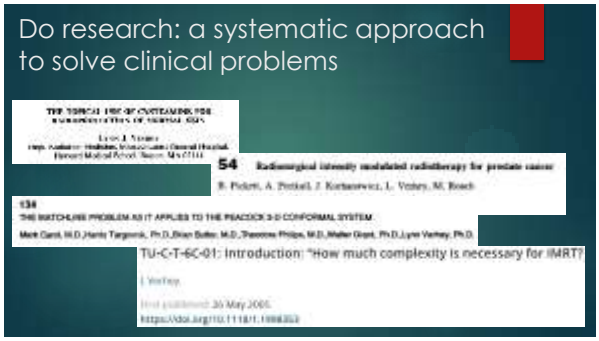
- Industrial engineering tools can be a resource for the entire department when other groups are implementing a new process or technique.
- Be the local expert on post-processing tools and educate physicians and staff
- Identify imaging processes that have relevance to Radiation Oncology
- Set up data recording systems to allow large scale studies correlating treatment procedures/parameters with outcomes

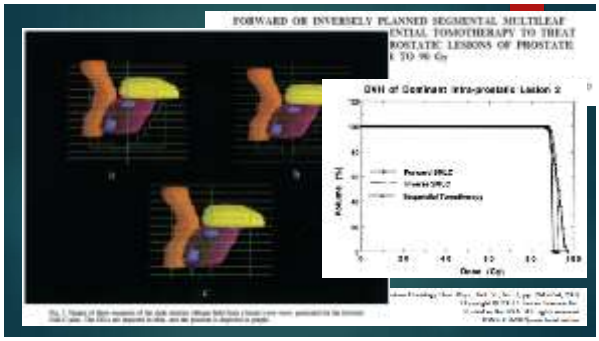






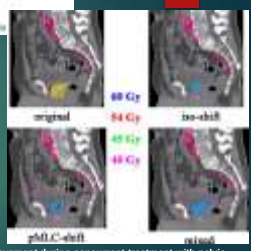
Do research: a systematic approach to solve clinical problems





An algorithm for shifting MLC shapes to adjust for daily prostate movement during concurrent treatment with pelvic lymph nodes a)

Altering the MLC portal shape is an effective strategy for dealing with the problem of the prostate moving independently from the pelvic lymph nodes during concurrent treatment. We hope that this strategy will be incorporated into future treatment delivery systems where the adjustment will become automatic.



An algorithm for shifting MLC shapes to adjust for daily prostate movement during concurrent treatment with pelvic lymph nodes. Med Phys 34(12), pp. 4750-4756, First published: 20 November 2007, DOI: (10.1118/1.2804579)

Clinical Medical Physicists: Teaching Leadership

- Actively participate in promoting educational activities within your department
  - Volunteer to lead a discussion on a new technique or technology and its potential value
  - Encourage and support others in presenting / leading efforts to introduce new ideas
- Leadership has many facets, including helping others to gain leadership skills and lead

Conclusions

- Be actively involved in all aspects of the Clinic
- Be involved in treatment planning – Understand the needs of patients
- Demonstrate the values of physics residents and physics to residents
- Do "research": a systematic approach to solve clinical problems

Thank you

"The best treatment plan is the simplest plan that meets the clinical objectives."
- Lynn Verhey (~1996)