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Economic and Clinical Factors Leading to Fundamental Changes in Radiation Oncology: A Vermont Perspective

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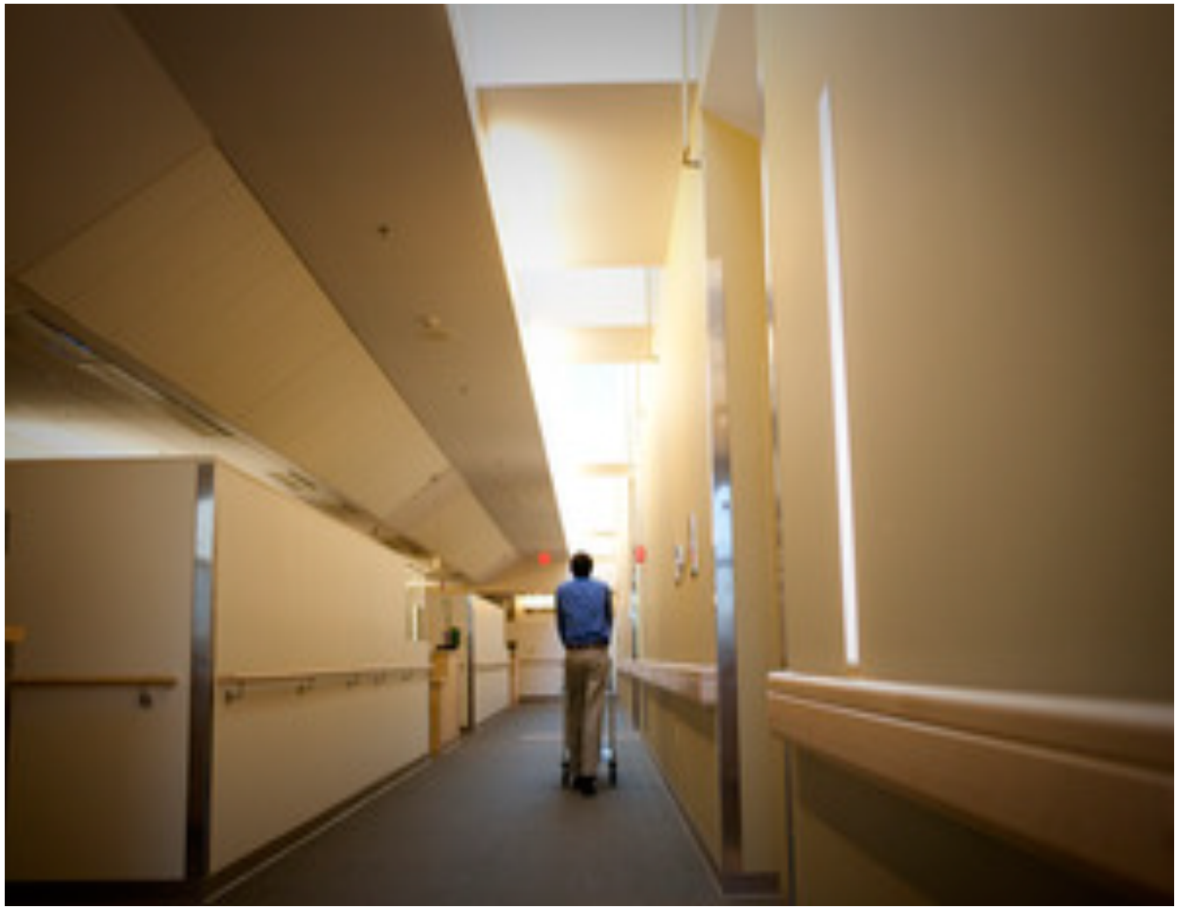
Goals

- Economic factors
- Clinical factors
- Connection/interplay between these factors
- Case studies

My Interest

- Other topics sought in clinical administration
- AAMD Board of Directors
- Dr. Mike Mills
- Dr. James Wallace & Choosing Wisely
- Dr. Deborah Rubin & Morbidity Indicies
- Recent economic/clinical changes



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Department Statistics

- 4.25 physician FTEs
- 3 Elekta linear accelerators
- 31 staff FTEs
  - Radiation Therapist: 11 FTEs (14 bodies)
  - Dosimetrists: 5 FTEs
  - Physicists: 4 FTEs
  - Nurses: 4 FTEs
  - Support staff: 6 FTEs
  - Manager: 1 FTE
- Volumes
  - ~ 15,500 Treatments
  - ~ 900 CT Simulations
  - ~ 200 Procedures (SRS, PSI, HDR)

Department Statistics

- HDR/SRS/SABR/Ultrasound/Vision RT/Prostate Implants
- Association with the University of Vermont
  - Radiation Therapy Program
  - Radiology Residents
  - Clinical Rotations Medical Students
- ACR Accreditation

Hospital Statistics

- The UVM Medical Center in alliance with the University of Vermont College of Medicine is Vermont's academic medical center and one of approximately 130 centers in the country.
- A regional referral center for approximately 1 million people in Vermont and northern New York
- Over 30 patient care sites and more than 100 outreach clinics, programs and services throughout Vermont and northern New York
- A community hospital for approximately 160,000 residents in Chittenden and Grand Isle counties
- Only Level I Trauma Center in the state
- UVM Cancer Center
- UVM Children's Hospital
- Comprehensive Cardiovascular & Stroke Care

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Hospital Statistics

- Three main campuses in Chittenden County, Vermont
- Eleven primary care clinics in Vermont
- 562 Licensed Beds
- Approximately 7,500 Employees
- Medical staff of nearly 800 physicians
- Approximately 600 UVM Medical Group physicians
- Approximately 190 community based physicians
- Approximately 300 residents
- 16 training residencies and 23 fellowship programs
- Approximately 160 advanced practice nurses and physicians assistants
- More than 1750 registered nurses

UVM Health Network

The UVM Health Network is an integrated health network across Vermont and northern New York consisting of 5 health care systems.

- University of Vermont Medical Center, Burlington, VT
- Central Vermont Medical Center, Berlin, VT
- Champlain Valley Physicians Hospital, Plattsburg, NY
- Elizabethtown Community Hospital, Elizabethtown, NY
- Alice Hide Medical Center, Malone, NY

Affiliations

- Canton-Potsdam Hospital, Potsdam, NY
- Inter-Lakes Health, Ticonderoga, NY

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Health Care Environment

- States of Vermont/New York
- Green Mountain Care Board
- Network creation
- Accountable Care Organization collaborate vs competition
- Lump sum payment
- Vermont is a test state being studied by the federal government that may lead to national changes
- Reimbursement model changes

Accountable Care

- The UVM Medical Center and Dartmouth-Hitchcock Medical Center are co-founders of OneCareVermont, an extensive network of doctors, health care facilities, academic medical centers, and rural clinics that work together to provide coordinated care and chronic disease management throughout the region.

Green Mountain Care Board

- Created in 2011 by the Vermont Legislature
- Independent group charged with ensuring that changes in the health system improve quality while stabilizing costs
- Members nominated by a broad-based legislative committee & appointed by the Governor

Green Mountain Care Board

GMCB main responsibilities

- Regulation
  - health insurance rates & hospital budgets
- Innovation
  - tests ways to pay for & deliver health care
- Evaluation
  - innovation projects, benefit & funding proposals, effect on economy

Required Actions

- Show efficiencies
  - Held to a specific budget
  - Fewer re-admission
  - Decrease costs
  - Other metrics
- Medicare guaranteed rate increase

Required Actions

- How to prove better care

Radiation Oncology Economics

- Will lump sum improve/degrade care
- Radiation oncology reimbursement changes

What UVMMC is Doing

This past year we made “too much” money (mostly because we saw more patients than we thought we would) so the network gave about 12 million dollars in total to local agencies to support housing and nutritional services. Homelessness is strongly correlated with hospitalizations, so the thought is that if we can help support housing we should need to admit less patients.

There is similar support for nutrition. Our entire budget process is driven by the limits imposed on us by the state.

Connection to Clinical Factors

ASTRO - Choosing Wisely

- Don’t initiate whole breast radiotherapy as part of breast conservation therapy in women age ≥50 with early stage invasive breast cancer without considering shorter treatment schedules.

- Don’t initiate management of low-risk prostate cancer without discussing active surveillance.

- Don’t routinely use extended fractionation schemes (>10 fractions) for palliation of bone metastases.

Connection to Clinical Factors

ASTRO - Choosing Wisely

- Don’t routinely recommend proton beam therapy for prostate cancer outside of prospective clinical trial or registry.
- Don’t routinely use intensity modulated radiotherapy (IMRT) to deliver whole breast radiotherapy as part of breast conservation therapy.
- Don’t recommend radiation following hysterectomy for endometrial cancer patients with low-risk disease.

Connection to Clinical Factors

ASTRO - Choosing Wisely

- Don’t routinely offer radiation therapy for patients who have resected non-small sell lung cancer (NSCLC) negative margins N0-1 disease.
- Don’t initiate non-curative radiation therapy without defining the goals of treatment with the patient and considering palliative care referral.
- Don’t routinely recommend follow-up mammograms more often than annual for women who have had radiotherapy following breast conserving surgery.
- Don’t routinely add adjuvant whole brain radiation therapy to stereotactic radiosurgery for limited brain metastases.

Connection to Clinical Factors

- Morbidity indicies
- Changing clinical practice

Clinical Changes

- Fractionation
- Treatment assessment/plan
- Clinical impacts
- Case examples

Fractionation Changes

- Breast
- Palliative
- Prostate
- Other Sites

Breast

- Traditional Fractionation
  - 2.0Gy x 25 fractions
  - 1.8Gy x 26 or 28 fractions
  - Boost 10.00Gy – 20.00Gy
- New
  - 2.65Gy x 16 fractions
  - 1.95Gy x 26 fractions
  - 2.67Gy x 15 fractions
  - 4.00Gy x 10 fractions
- Move to Less Fractionation
- Utilization?

Palliation

- Traditional Fractionation
  - 3.0Gy x 10 fractions
  - 2.5Gy x 12 or 14 fractions
- New Fractionation
  - 8.0Gy x 1 fraction
  - 4.0Gy x 5 fractions
  - 7.0Gy x 3 fractions
  - ?

Palliation

- Brain Mets with SRS
  - 24.00Gy x 1 <2 cm
  - 18.00Gy x 1 2-3 cm
  - 15.00Gy x 1 3-4 cm
- Move to Less
- Justified?

Prostate

- Traditional
  - 60 - 80Gy with up to 42 fractions
- New
  - RTOG0415 70Gy in 28 fractions should be the standard hypofraction as well

Lung

- Traditional
  - 30.00 to 60.00Gy
- New
  - 3D Conformal to 70.00Gy
  - SABR 3 to 5 fractions of 54.00Gy to 50.00Gy
- Move to Less/More?

Brain

- Traditional Fractionation
  - 1.80 – 2.00Gy x 28 or 30 fractions
- New Fractionations
  - Protocol NRG-BN001 ARM B
    - 2.50Gy x 30 fractions to PTV_7500
    - 1.67GY x 30 fractions to PTV_5000

Boom Boom

- Amusing
- 2.00Gy x 2 fractions
- Lymphomas

Other Sites

- Trend to hypofraction as well

Changes Treatment Assessment

- Nomogram/Charlson Comorbidity Index
- ASTRO Choosing Wisely
- Appropriate palliative care team
- Future of protocols vs proven treatment
- Clinical vs economic drivers
- Who, what, where

Charlson Comorbidity Index

- 12 comorbid conditions
- Assigned weight
- Index is based upon ratio of mortality risk for patients with the comorbidity of interest vs the mortality risk for those without the comorbidity
- Other indicies
  - NCI
  - ACE-27
  - C3

Nomogram

Cancer. 2014 Jan 1;120(1).doi:10.1002/cncr.28408. Epub 2013 Oct 2.

Predicting life expectancy in patients with metastatic cancer receiving palliative radiotherapy: the TEACHH model.

Krishnan MS1, Epstein-Peterson Z, Chen YH, Tseng YD, Wright AA, Temel JS, Catalano P, Balboni TA.

TEACHH

- T=Type of cancer ++ Breast or Prostate vs Lung
- E=ECOG performance status ++ 0-1 vs 2-4
- Age ++ <60 vs >60
- C=Chemotherapy ++ previously treated 0-1 vs 2 or more
- H=Hospitalization ++ 0-1 vs 2 or more
- H=Hepatic metastases ++ no vs yes

TEACHH Predictors for Survival

- 0-1 risk factors = 20 months
- 2-4 risk factors = 5 months
- 5-6 risk factors = 1.7 months

Treatment Assessment

- Prognostic factors in patients presenting with spinal cord compression
  - Number of vertebrae involved
  - Ability to ambulate
  - Visceral metastases
  - Duration of time symptomatic
  - Response to steroids

Functionality

Well known to be a strong prognosticator in overall survival for almost all clinical entities including cardiac disease, dementia, and cancer.

ECOG and Karnofsky scores used in nearly all research studies for the past 3 decades essentially measures how functional the patient is; how many hours awake and moving and caring for themselves.

Karnofsky greater than 80 and ECOG 2 or greater imply the patient is up and around at least for half of the day.

An ECOG 3 or higher or Karnofsky less than 80 are strongly associated with survival measured in months or weeks.

Functionality

In spite of the usefulness of knowing the patient's performance status we do not routinely ask our patients or their caregivers specifics regarding activities of daily living, how much of 24 hours is spent sleeping, if they are able to care for themselves and their home.

Particularly important for our therapists who are responsible for a patient who struggles to get on the table, is uncomfortable during treatment, cannot adequately communicate their needs, and/or does not fully understand what is happening.

These patients are far better served with hypofractionated therapy.

Palliative Care UVMMC

- In many hospitals the focus of palliative teams is often on terminal care due to limited resources. How is Early Palliative Care (EPC) in this setting implemented in daily oncologic care?
- Robust Palliative Care Team at UVMMC

Future of Protocols

- Will changes in reimbursement allow hospital budgets to shift resources to research?
- Will these changes affect smaller and single practices from participating? These groups contribute many patients to studies.
- Challenges to prove effectiveness.
- More selective studies.

Clinical vs Economic Drivers

- Will a balance be possible with these changes?

Clinical Impacts

- Same number of visits vs treatment
- Therapists/patient interaction changes
- Evaluate future utilization/funding
- Jobs
- Change to Patient & Family Centered Care

Patient and Family Centered Care

The University of Vermont Medical Center recognizes that patients and their families have valuable wisdom, advice, and experiences that can be used to improve the delivery, quality, and safety of health care.

Therefore, as an organization we are dedicated to working in active partnership with patients and families, institutional leaders, health care providers, and staff to implement the core principles of patient-and family-centered care.

Patient and Family Centered Care

These foundational principles are:

- Dignity and Respect

  Patient and family knowledge, values, beliefs, and cultural backgrounds are incorporated into the planning and delivery of care. Their perspectives and choices are listened to and honored in all phases of care.

Patient and Family Centered Care

- Information Sharing

  Patients and families receive timely and accurate information in order to effectively participate in their care. Health care providers communicate and share complete and unbiased information with patients and families in ways that are affirming and useful.

Patient and Family Centered Care

- Participation

  Patients and families are encouraged and supported to participate as integral members of their health care team.

Patient and Family Centered Care

- Collaboration

  Patients and families are included on an institution-wide basis. Health care leaders collaborate with patients and families in policy and program development, implementation, and evaluation; in health care facility design; and in professional education, as well as in delivery of care.

Example Case

- Costs of clinical decisions: Ethics
  - SABR vs standard (complex) planning
  - $75,000 vs $33,000
  - A 78-year-old with COPD, 2cm primary
  - Add in diabetes with elevated creatinine and activity limited by SOB and their 3 year overall survival goes from 68% to 43%
  - Does the predicated survival justify the cost?

Palliative Brain

- Lung cancer patient with brain mets
- Whole Brain vs SRS vs IMRT with hypocampus sparing
- Whole brain $35,000
- SRS $45,000
- IMRT $78,000
- Cost vs benefit

Thank you!

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