Society for Radiation Oncology Administrators
Annual Meeting

Proton Therapy:
Is This Technology a Correct Fit for Your Radiation Oncology Service?

Pasadena, California

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903 Airport Drive, Suite 3
Ann Arbor, Michigan 48108
Tel (734) 913-4000
Fax (734) 913-4318
www.arvinagroup.com

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Session Presenters

Joseph M. Spallina, FAAMA, FACHE
Director
ARVINA GROUP, LLC
Ann Arbor, Michigan
jspallina@arvinagroup.com
www.arvinagroup.com

Barry W. Wessels, Ph.D.
Professor and Director
Division of Medical Physics and Dosimetry
University Hospital Case Medical Center
Cleveland, Ohio

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Session Outline

- Background
- Proton Therapy Service Development Planning Framework
- Technical Evaluation
- Summary

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Session Design

- **Expertise and Experience:**
  - **Advanced**
  - **Practical**
- **Audience Mix:**
  - **Smaller radiation oncology service; want to understand the technical and planning considerations?**
  - **3+ vault radiation oncology service; considering evaluating/planning a proton therapy service?**

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Learning Objectives

- Installations; existing and planned.
- Current vendors, their products, and potential technology developments.
- Disease specific applications.
- Key considerations in planning (service, facilities, operations, capital, reimbursement).
- The current state of technical characteristics regarding proton therapy.

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Proton Therapy Background

What has and is occurring?

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Proton Therapy Background

- **Mature science:**
  - **Recent technological and manufacturing developments are permitting the current equipment development.**
- **Radiation therapy delivery using protons:**
  - **Primary attraction is the superior properties of the radiation therapy delivery.**
  - **There is debate regarding efficacy of the technology.**

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Proton Therapy Background

- Currently five centers operating in the US:
  - A number of other centers operating internationally.
  - At least 10+ announced/planned to be operational by 2010 and most likely more after that.
- Vendors:
  - Single unit/non-scaleable:
    - Still River Systems.
  - Large, multiple gantry, scaleable units (including single):
    - Hitachi, IBA.
  - Additional vendors expected to enter the market:
    - Varian, other (s)?

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Proton Therapy Background

- **An expensive technology:**
  - **Investment:**
    - **$20 million - $200 million.**
    - **To partner or not?**
  - **Staffing:**
    - **7 - 10 FTE's for a single unit.**
    - **15+ for multiple gantries.**
  - **Other operating costs = commensurate with the complexity of the equipment.**

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Proton Therapy Background

- **An expensive technology (*continued*):**
  - **Facilities:**
    - **3,000+ net useable square feet – 4 acres.**
    - **Proximity to imaging and radiation medicine is important.**
  - **Planning team = experts required.**
- **Reimbursement:**
  - **Medicare covers more disease sites than commercial payors.**
  - **Declines in Medicare payments from 2007 – 2008.**
  - **Additional reimbursement to be gained from image guided complements.**

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Proton Therapy Planning

Proton Therapy Applications 2007

Cancer	Proton Therapy Candidates (1)	Proton Therapy Fractions
Approval: Medicare & Private/Commercial Payors		
Arteriovenous Malformation	55% - 60%	1
Brain & CNS	50% - 55%	30 - 35
Intraocular Melanoma	100%	15
Prostate	50% - 55%	35 - 40
Approval: Medicare Only		
Breast	5% - 10%	20 - 25
Colorectal	55% - 60 %	20 +/-
Head & Neck	25% - 30%	25 - 30
Liver	15% - 20%	20 +/-
Lung	35% - 40%	25 - 30

1. As a % of radiation therapy patient candidates.

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Proton Therapy Planning

What should be considered to evaluate and potentially plan a proton therapy service?

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Proton Therapy Planning

- **Estimating capacity:**
  - **High cost = high expectations for operational performance.**
  - **Treatment times (patient/fraction time):**
    - **30 – 45 minutes.**
    - **Learning curve during initial years of operation.**
  - **Daily operations:**
    - **At least six days/week.**
    - **At least 14 hours per day.**
    - **Uptime = 85%.**

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Proton Therapy Planning

- **Estimating capacity (*continued*):**
  - **Patient mix:**
    - **50% - 60% Medicare (reflect your experience).**
  - **Disease mix:**
    - **Reflect your market experience.**
  - **Regional proton therapy competition:**
    - **Reasonable assumptions must be made!**

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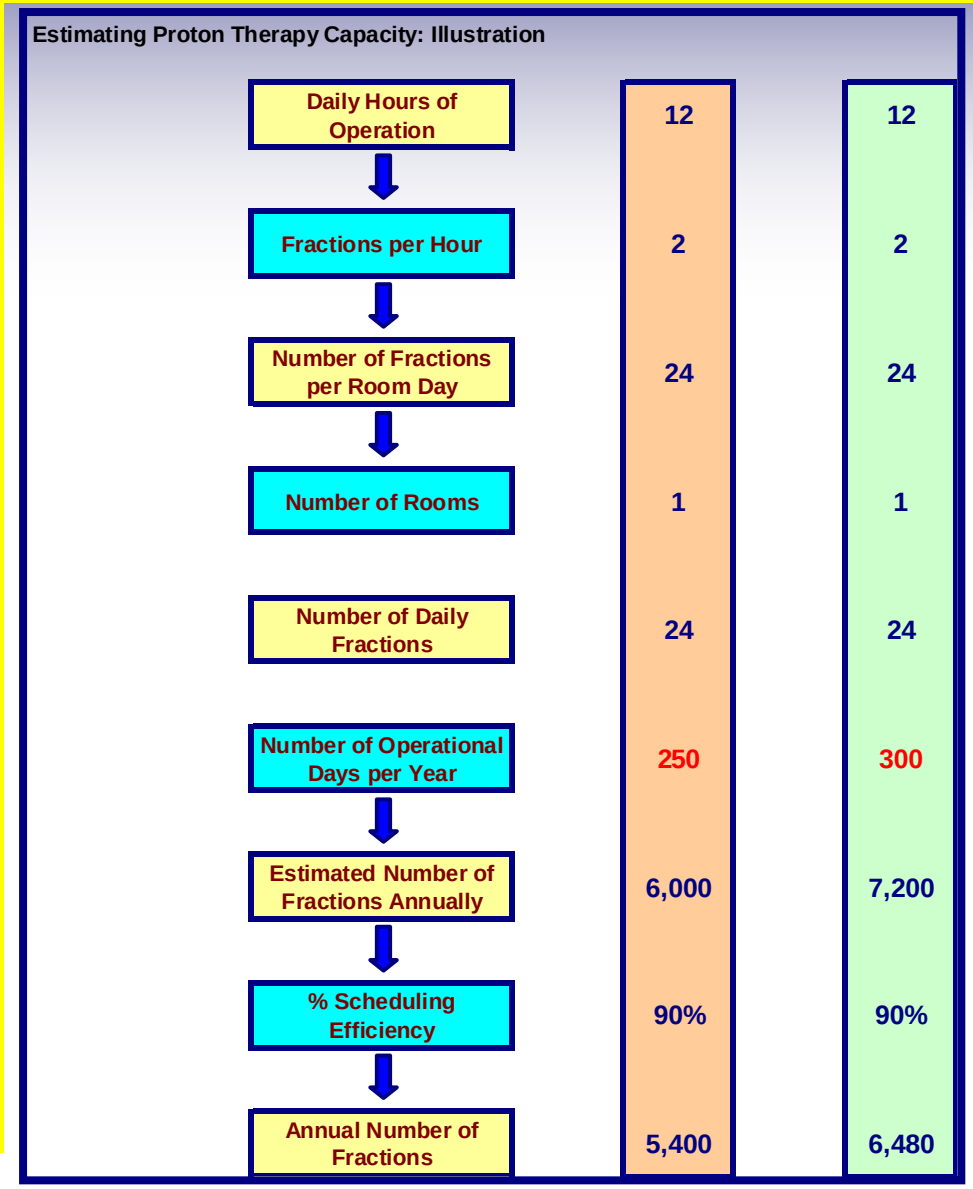
Proton Therapy Planning



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Proton Therapy Planning

- **Reimbursement:**
  - **Medicare and commercial payors currently reimburse for prostate cancer, brain/CNS cancer, intraocular melanoma, and arteriovenous malformation.**
  - **Approved by Medicare, but not yet received full endorsement of commercial payors breast, lung, colorectal cancer, head & neck, liver.**
  - **As expected, Medicare reimbursement declining:**
    - **Increases the financial risk and the market size served.**
  - **Image guided procedures will add to reimbursement.**

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Proton Therapy Planning

Medicare Proton Therapy Reimbursement (APC)

APC	HCPC	TITLE	2007 WEIGHT	2007 PAYMENT	2008 WEIGHT	2008 PAYMENT	% $ CHANGE 07 - 08
		Level I Proton Beam Radiation Therapy	18.8926	1,161.29	13.2746	845.50	**-27.2%**
0664	77520	Proton trmt, simple w/o comp					
0664	77522	Proton trmt, simple w/comp					
		Level II Proton Beam Radiation Therapy	22.6031	1,389.37	15.8841	1011.71	**-27.2%**
0667	77523	Proton trmt, intermediate					
0667	77525	Proton treatment, complex					

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Proton Therapy Planning

- **Estimating demand:**
  - **Proton therapy for the most part substitutes for part of the IMRT/IGRT segment:**
    - **What will research demonstrate regarding IMRT/IGRT vs. proton therapy outcomes (short and long term) and efficacy?**
  - **How elastic are referrals, considering:**
    - **Existing provider owned investments?**
    - **Proximity to the nearest proton center?**
    - **Patient and family out of pocket expenses?**
    - **Reasonable assumptions must be made!**
  - **Population and disease specific methodology is required.**

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Proton Therapy Planning

Proton Therapy Disease Specific Estimates: Illustration

Cancer	Cancer Incidence	% Rad'n Eligible	Radiation Candidates	% Proton Eligible (1)	Proton Candidates	% Payor Approved	Est'd Proton Patients
Approval: Medicare & Private/Commercial Payors							
Arteriovenous Malformation				55% - 60%		95.0%	
Brain & CNS				50% - 55%		95.0%	
Intraocular Melanoma				100%		95.0%	
Prostate				50% - 55%		95.0%	
Approval: Medicare Only							
Breast				5% - 10%		50.0%	
Colorectal				55% - 60 %		50.0%	
Head & Neck				25% - 30%		50.0%	
Liver				15% - 20%		50.0%	
Lung				35% - 40%		50.0%	

1. As a % of radiation therapy candidates.

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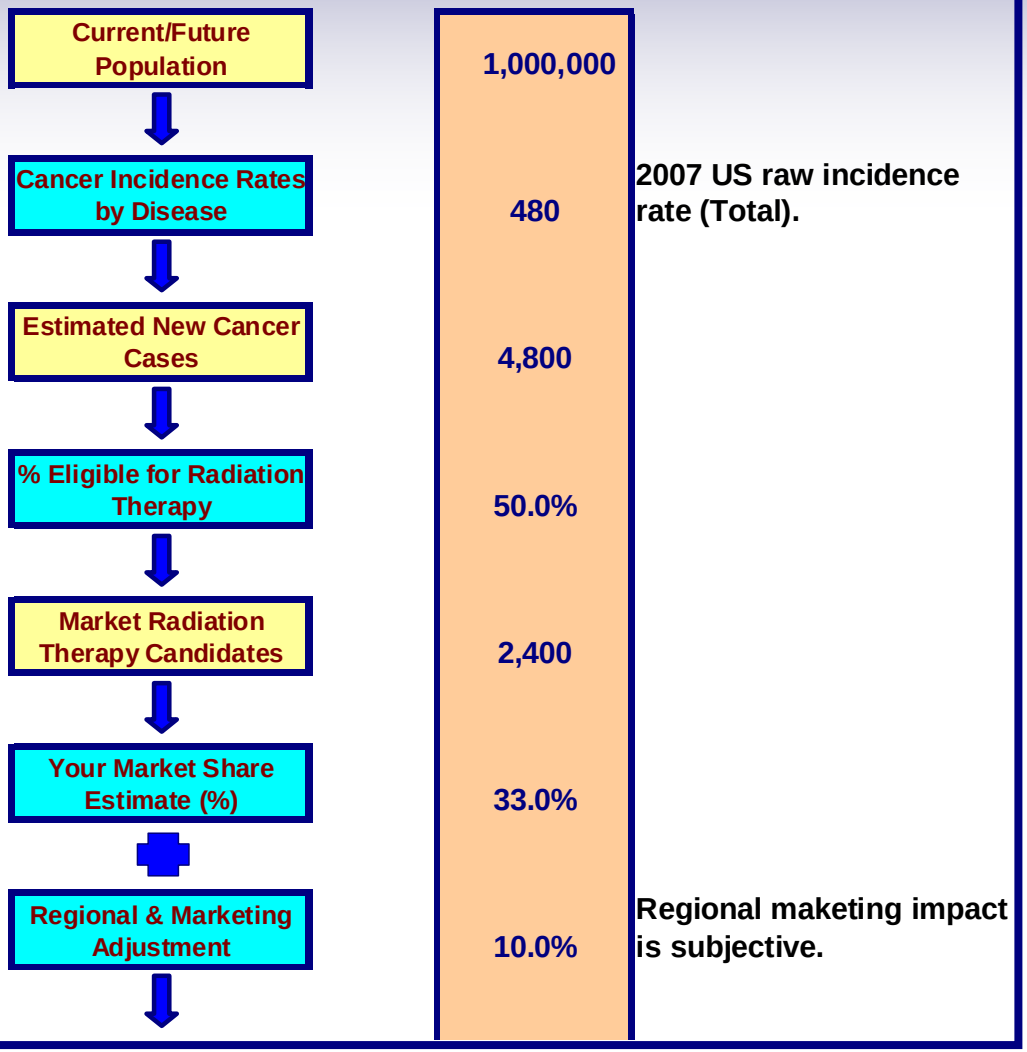
Proton Therapy Planning

Estimating Proton Therapy Demand: Illustration



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Proton Therapy Planning

Your Radiation Therapy Candidates	880	
% Proton Eligible by Disease & Payor	25.0%	Disease specific range = 15% - 50% of XRT. Overall range is 15% - 30%. Highly debatable.
Your Proton Therapy Candidates	220	
Fractions per Patient (by Disease)	25	Disease specific; ranges between 20 - 30.
Your Total Annual Proton Fractions (by Payor)	5,500	
Proton Therapy Rooms Required	1.0	Capacity = at least 5,400 - 6,500 fractions annually per room.

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Proton Therapy Planning

- **Strategic business plan:**
  - **Must be prepared; critical review and analysis required; must include:**
    - **Technology selection.**
    - **Project costs, working capital, partners (if any), and sources of funds.**
    - **Business organization.**
    - **Demand estimates and sensitivity analyses.**
    - **Operating assumptions and capacity.**
    - **Start up and operating costs.**
    - **Reimbursement and sensitivity analyses.**
    - **ROI analysis.**
    - **Marketing and referral relationship strategies.**

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Proton Therapy Planning

What do we know, what have we learned, and what can we expect regarding the science and technology surrounding proton therapy?

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