



MOFFITT
CANCER CENTER

Radiation Oncology

Geographic Distribution of New/Scarce Technology

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Disclosures

- Clinical Advisory Board,
Novocure

*What are the pros and cons of
Certificate of Need programs?*

Certificate of Need Legislation and the Dissemination of Robotic Surgery for Prostate Cancer

Bruce L. Jacobs,^{*,†} Yun Zhang, Ted A. Skolarus, John T. Wei, James E. Montie, Florian R. Schroeck[†] and Brent K. Hollenbeck^{‡,§}

BRIEF REPORTS AND OPINION

Association Between Certificate of Need Legislation and Radiation Therapy Use Among Elderly Patients With Early Cancers

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Department of Radiation Oncology, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina

CON programs

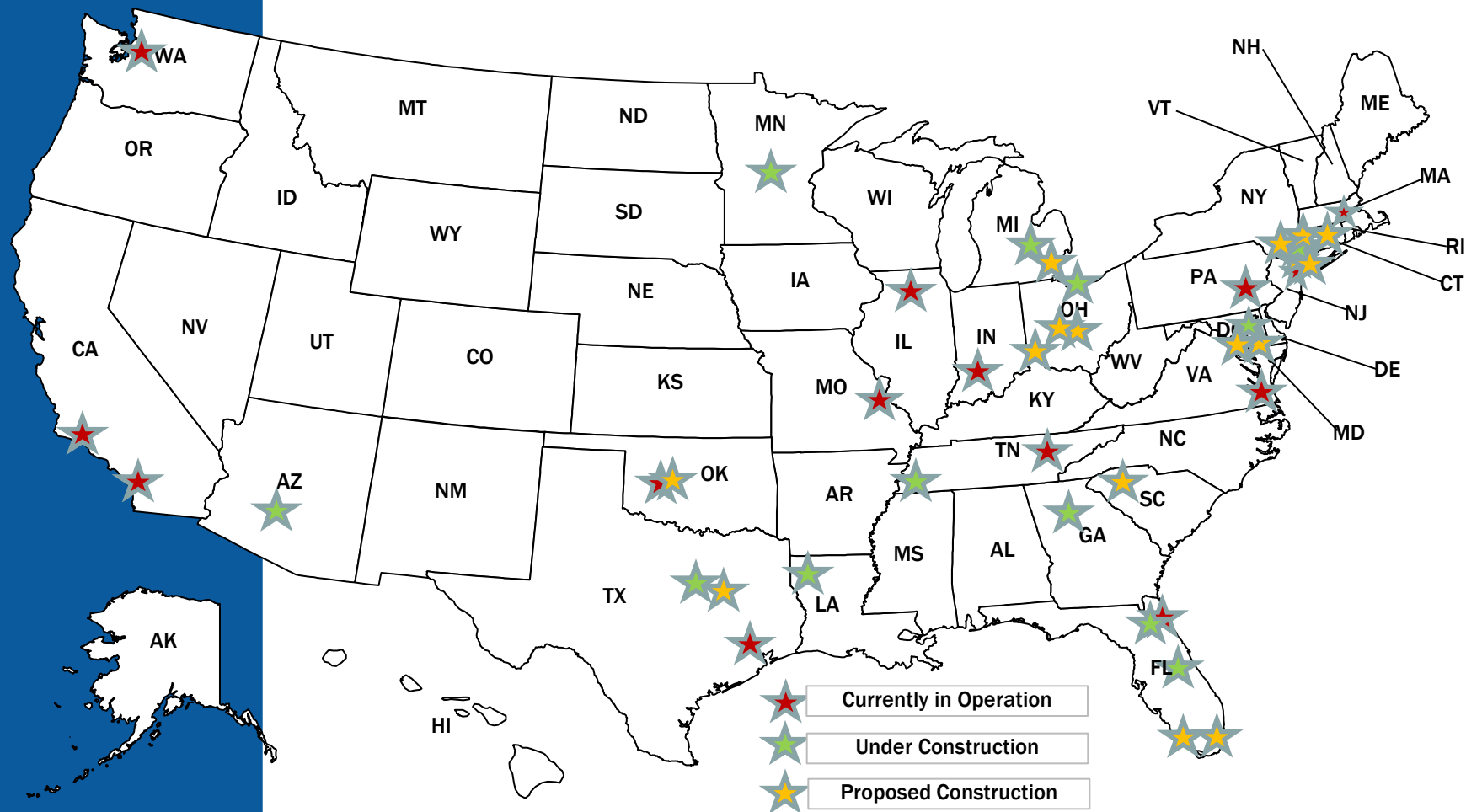
- Questionable utility for assets in ~\$2-5M range
- Likely of less utility for \$150M assets
 - Market forces predominate
 - Presumes money is hard to find
 - Presume valid *pro formas*

2004



7/21/2015

2014



7/21/2015



From the fields of biology, neuroscience, economics, positive psychology, network science, marketing, management theory, and more—here are the emergent ideas that are changing the way business is done.

THE HBR LIST

Breakthrough Ideas for 2004

Breakthrough Ideas for 2004 • THE HBR LIST

6.

The Force Behind Gigli

Joel Kurtzman

Investors are always scrambling to find out where the “smart money” is going. It’s also important, whether you’re an investor or a business manager, to know where the stupid money is going.

How can we determine the appropriate number of facilities with advanced technologies for a given population?

How can we determine the appropriate number of facilities with advanced technologies for a given population?

Depends on:
Patient throughput
Available patients

Drivers of patient throughput

- Patient complexity
- Beam availability
- Staff experience



Proton Facility Economics: The Importance of “Simple” Treatments

Peter A. S. Johnstone, MD^{a,b}, John Kerstiens, CPA^b, Richard Helsper, MBA^b

Purpose: Given the cost and debt incurred to build a modern proton facility, impetus exists to minimize treatment of patients with complex setups because of their slower throughput. The aim of this study was to determine how many “simple” cases are necessary given different patient loads simply to recoup construction costs and debt service, without beginning to cover salaries, utilities, beam costs, and so on. Simple cases are ones that can be performed quickly because of an easy setup for the patient or because the patient is to receive treatment to just one or two fields.

Methods: A “standard” construction cost and debt for 1, 3, and 4 gantry facilities were calculated from public documents of facilities built in the United States, with 100% of the construction funded through standard 15-year financing at 5% interest. Clinical best case (that each room was completely scheduled with patients over a 14-hour workday) was assumed, and a statistical analysis was modeled with debt, case mix, and payer mix moving independently. Treatment times and reimbursement data from the investigators’ facility for varying complexities of patients were extrapolated for varying numbers treated daily. Revenue assumptions of \$X per treatment were assumed both for pediatric cases (a mix of Medicaid and private payer) and state Medicare simple case rates. Private payer reimbursement averages \$1.75X per treatment. The number of simple patients required daily to cover construction and debt service costs was then derived.

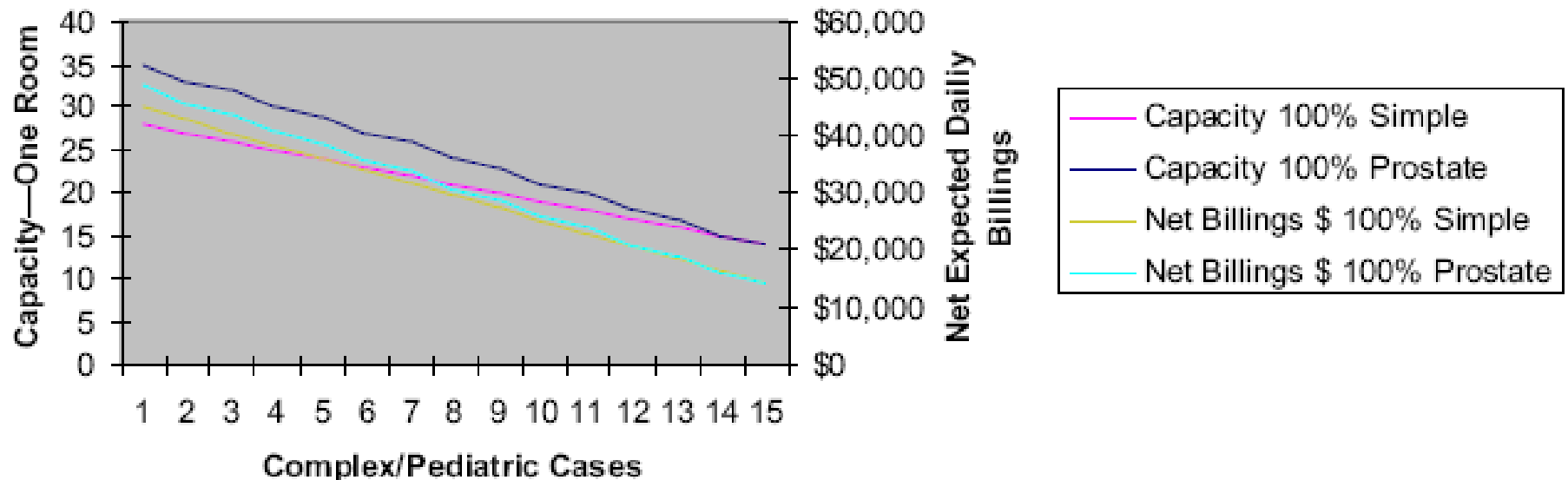
Results: A single gantry treating only complex or pediatric patients would need to apply 85% of its treatment slots simply to service debt. However, that same room could cover its debt treating 4 hours of simple patients, thus opening more slots for complex and pediatric patients. A 3-gantry facility treating only complex and pediatric cases would not have enough treatment slots to recoup construction and debt service costs at all. For a 4-gantry center, focusing on complex and pediatric cases alone, there would not be enough treatment slots to cover even 60% of debt service. Personnel and recurring costs and profit further reduce the business case for performing more complex patients.

Conclusions: Debt is not variable with capacity. Absent philanthropy, financing a modern proton center requires treating a case load emphasizing simple patients even before operating costs and any profit are achieved.

Key Words: Protons, prostate cancer, health services research

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Debt is not variable with capacity.
Revenue is...



Drivers of patient throughput

- Patient complexity
- Beam availability
- Staff experience

Availability (A_v)



MDACC

-  only includes events resulting in treatment breaks > 15 mins
-  Average yearly $A_v = 97\%$ from 6/07 – 8/10



LLUMC

-  based on the number of treatments missed due to equipment failure not accounting for the actual length of time that the facility can be used to deliver treatments
-  Average $A_v = 98.8\%$

Availability (A_v)

IUHPTC

✦ $A_v = 100 \times \text{Uptime} / (\text{Uptime} + \text{Downtime})$

- ✦ uptime and downtime are summed for all 3 tx rooms

Scheduled use includes: patient treatments
research,
commissioning of new equipment,
quality assurance testing.

We also include any time when the schedule is extended due to unforeseen circumstances.

- ✦ Downtime includes any interruptions where the proton beam is requested for research, testing, or treatment, but cannot be delivered regardless of the cause.

Impact of proton beam availability on patient treatment schedule in radiation oncology

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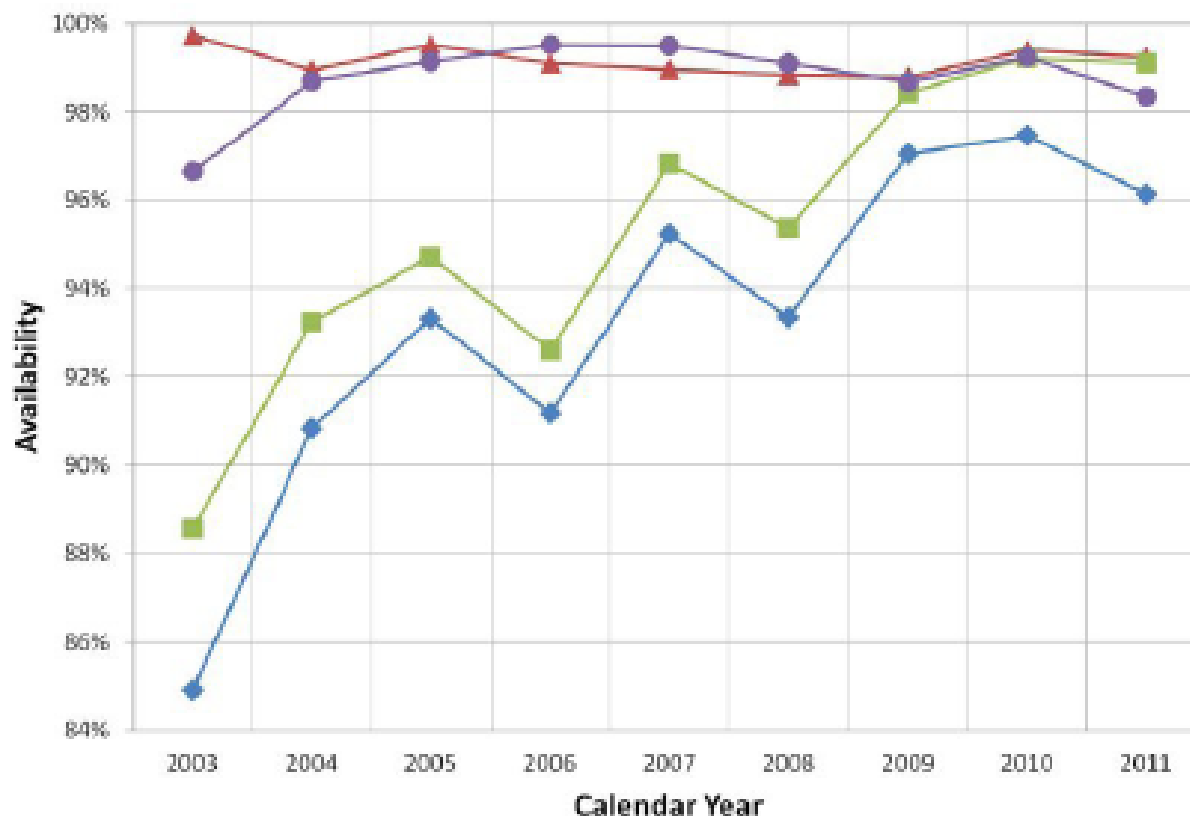
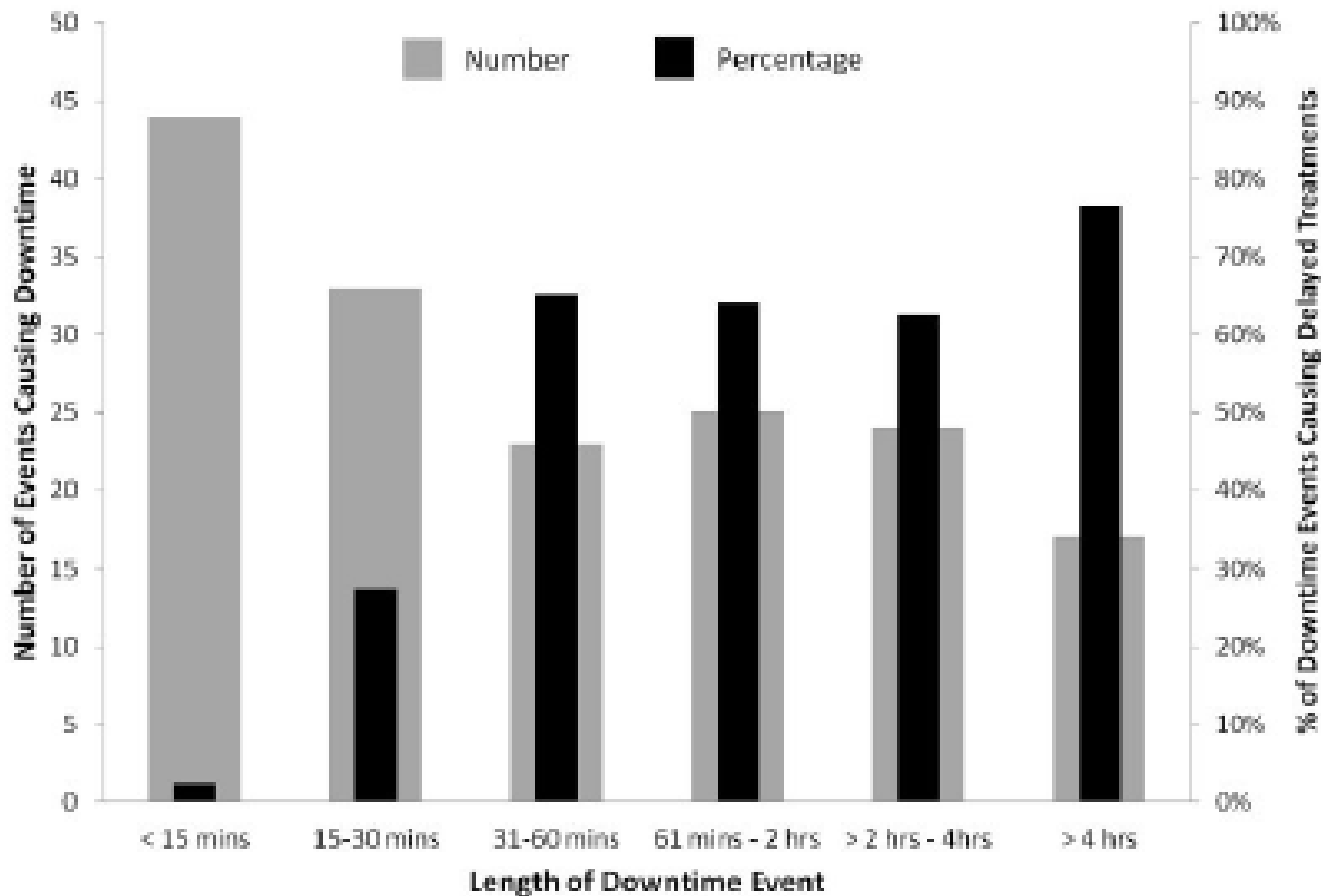


FIG. 1. Availability for calendar year 2003 to 2011. Data points correspond to overall availability (◆), availability for the treatment room systems from the kicker magnet through the nozzle and patient positioning system (▲), the cyclotron and beamlines alone (■), and external issues (●) which includes downtime related to power failures, weather related events, user errors, and failure of the X-ray system.

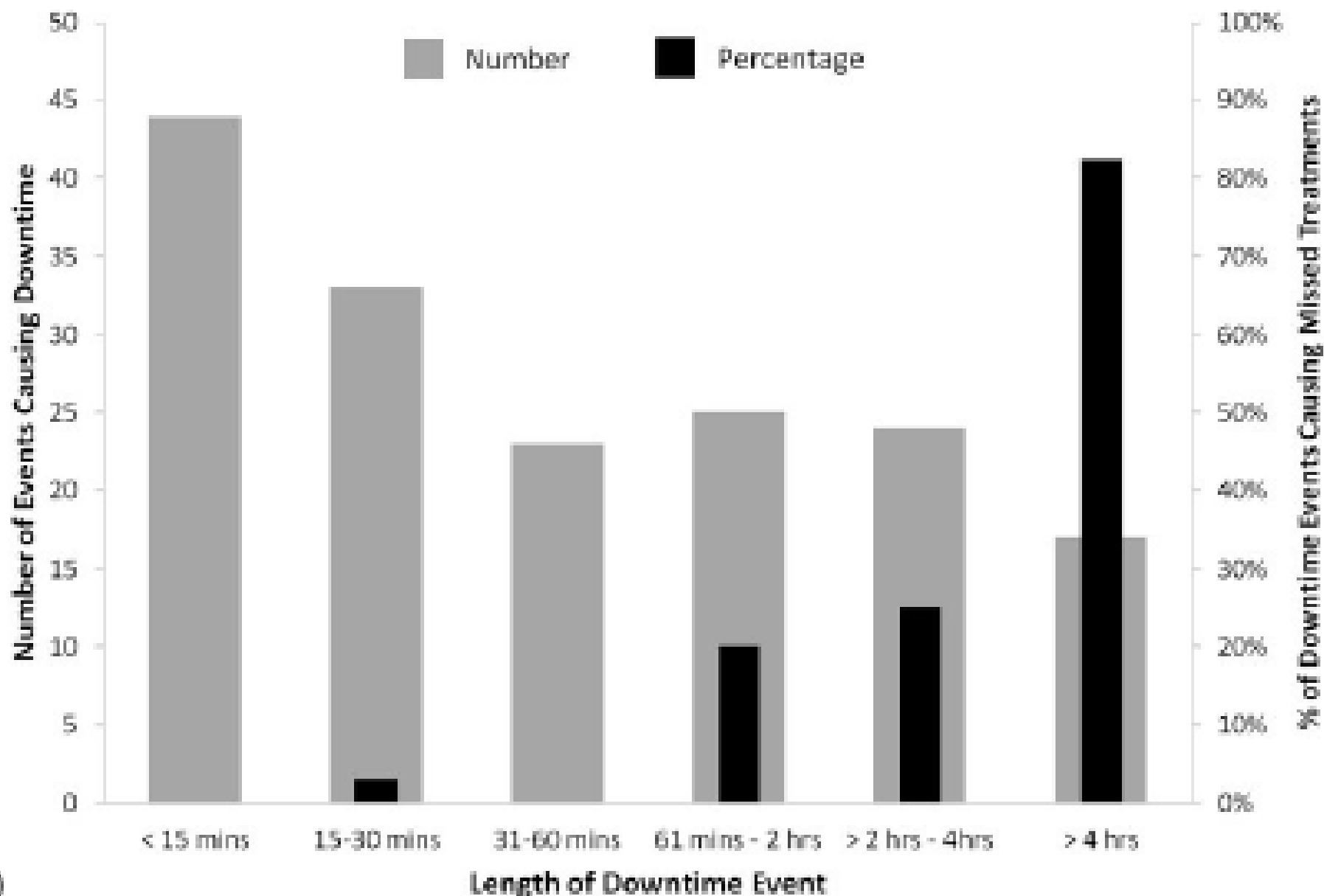


Treatment delays





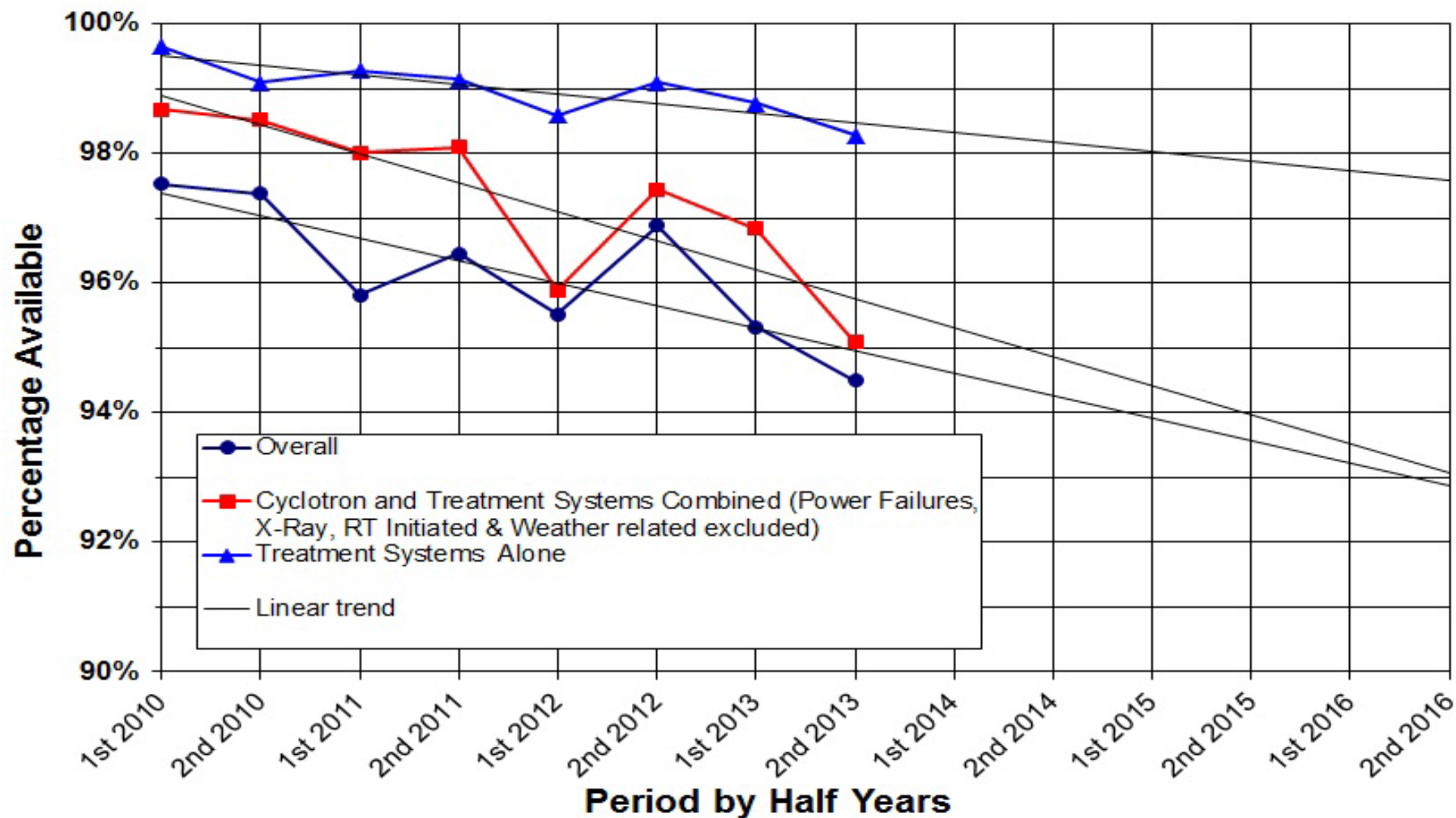
Missed Treatments





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Availability by Half Year Through December 2013

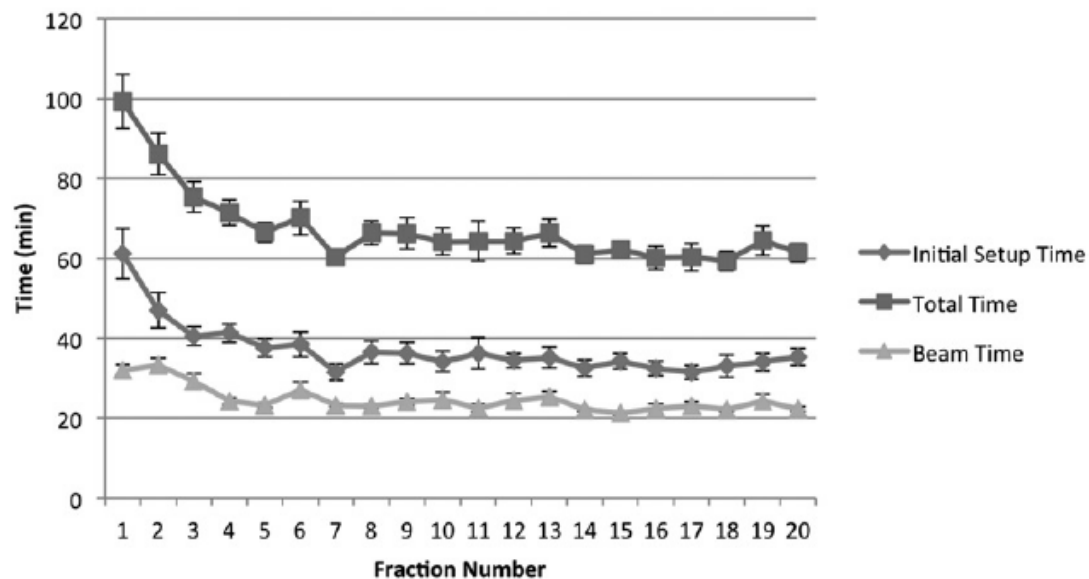
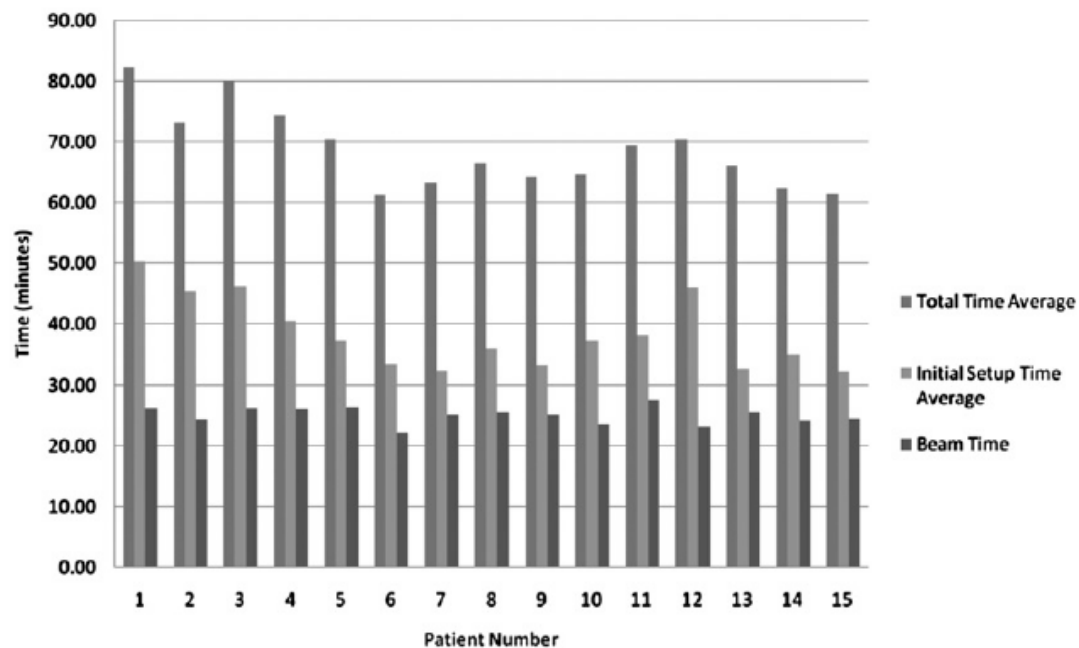


Drivers of patient throughput

- Beam availability
- Patient complexity
- Staff experience

Overcoming the Learning Curve in Supine Pediatric Proton Craniospinal Irradiation

Madhavi Singhal, BS, Andrew Vincent, BS, Victor Simoneaux, BS, Peter A.S. Johnstone, MD, Jeffrey C. Buchsbaum, MD, PhD, AM



Clinical Investigation

Proton Therapy Expansion Under Current United States Reimbursement Models

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Census modeling study

- Cancer rates for 10 regional US metropolitan areas
 - Per Advisory Board Company data
- Applied case mix per the Glimelius study
 - “Number of patients potentially eligible for proton therapy.”
- Integrated IUHPTC experience on payer coverage
- Did NOT include Peds, skull base, chondrosarcoma, etc

Census Modeling study

- Calculated fractions needed using IUHPTC pathways
- Calculated treatment room capacity
- Determined the number of rooms needed to serve that population

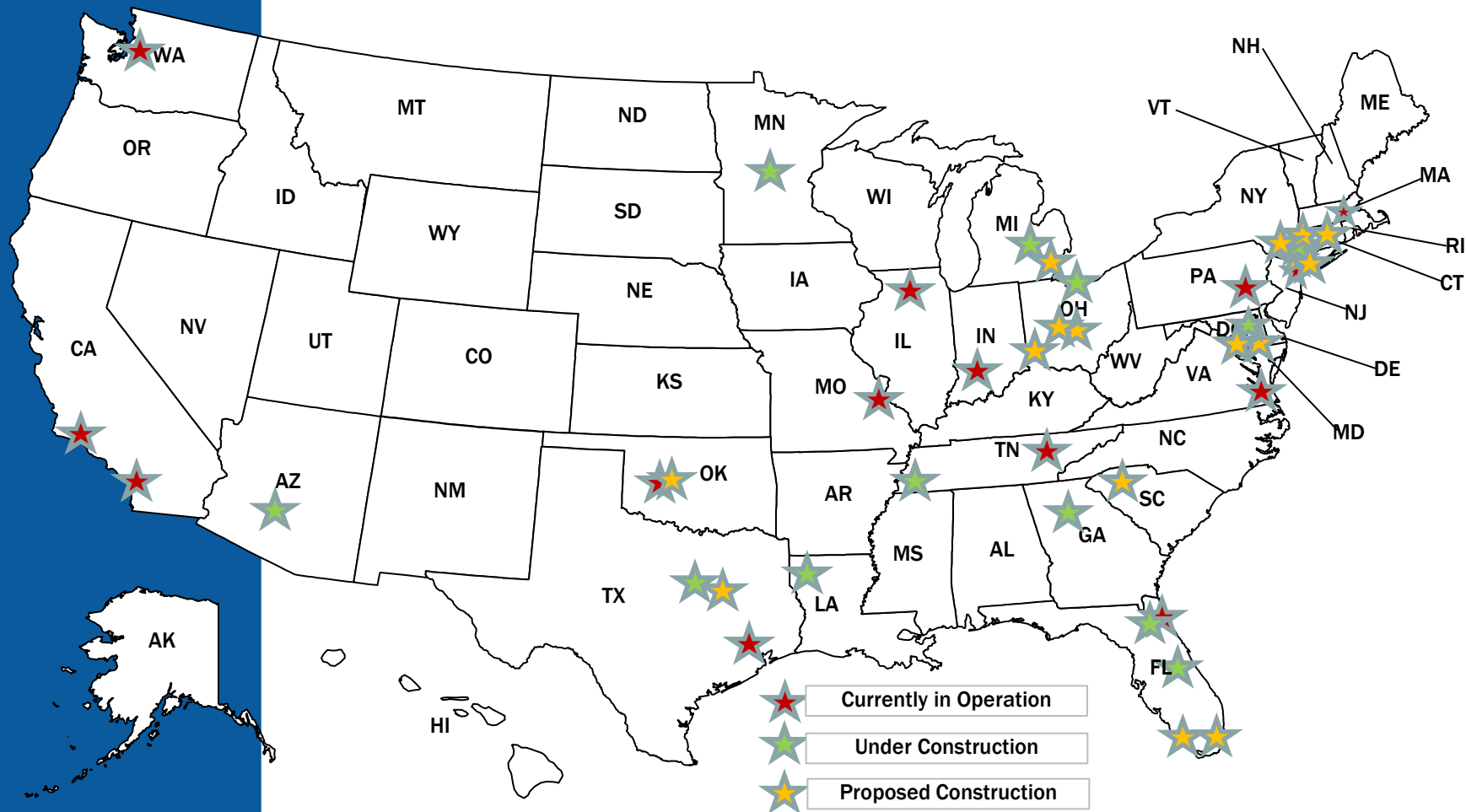
Table 1 Modeled number of proton therapy rooms required for select US metropolitan areas

Metropolitan area	2010 Estimated population	2012 Advisory Board estimate	% Proton appropriate, per Glimelius et al (2)	No. of eligible cases	Total min per case, per patient	No. of rooms needed to treat @ 3900 h per room
Atlanta	5,268,860					
Brain and other CNS		345	22	75	117,912	
Oral cavity and pharynx		592	75	444	659,340	
Prostate		3339	4	127	83,742	
					860,994	4
Charlotte	1,758,038					
Brain and other CNS		153	22	33	52,292	
Oral cavity and pharynx		267	75	200	297,371	
Prostate		1542	4	59	38,673	
					388,336	2

Census Modeling study

- Each ~1.0M unserved population = 1 room.
- A 4 room center requires ~4.0M people
previously without protons
- Rough equivalence:
 # rooms = # Pro sports teams

2014



The Pro Sports Theory

(NBA Franchises)



Census Modeling study

- Different phenomenon entirely, but both population-based
- Only very large cities will support more than one franchise in any sport
 - ➡ IND 2 total (Colts + Pacers) / 2 rooms
 - ➡ OKC 1 (Thunder) / 4 (+1) rooms
 - ➡ Tampa Bay 3 (Rays + Bucs + Lightning)

Patient Availability

- Plus
 - Consolidation of healthcare systems
 - Shared assets
 - Scripps
 - Chicago
 - NJ
- Minus
 - System competition
 - Jax
 - OKC
 - NJ

Caveats

- New data may support expansion of treatment sites
- Expect reimbursement to decrease
- Hypofractionation is the order of the day
- Pediatric PrT loses money

