

Appropriate Use of Advanced Technologies for Radiation Therapy and Surgery in Oncology

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WOROKSHOP WRAP UP

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Making Cancer History®

Lessons Learned - 1

- Photon and Proton
 - Major advantage: spare normal tissue
 - Well accepted clinical benefit in some cancer sites (e.g., IMRT in head & neck cancer and proton for pediatric cancer patients), although clinical benefits to common cancers in adults remained unclear
- Laparoscopic and robotic surgery
 - Supportive evidence of laparoscopic procedures from basic science research
 - Key benefits of robot: 3D visualization and wrist instrumentation
 - Clear benefits in some aspects (e.g., smaller incision, shorter LOS) but mixed findings in cancer control and functional outcomes

Lessons Learned - 2

- **Comparative Effectiveness Research**
 - Offers an alternative tool to assess clinical benefits of new technologies when trials data are difficult to get
 - Value-added: reflect real-world diffusion pattern, population-based assessment, ability to study costs
 - Challenges:
 - Quality of clinical variables may be compromised
 - Cost may not capture full cost
 - Difficult to differentiate sources of variations (procedure vs. operator vs. device)
 - Need for more advanced statistical methods to reduce biases, difficult to establish causality

Lessons Learned - 3

- History does repeat itself, although the cost to the healthcare system and patients is substantially higher today
- While IMRT may have reached the 'mature' stage of technology diffusion, diffusion of proton just began
- Robotic surgery likely saturated the market of radical prostatectomy and is expanding quickly in GYN oncology
- Pace of technology adoption and de-adoption tends to be driven more by economic consideration than clinical evidence → limit the impact of negative trial publication
- Lower tech approaches have been less quickly adopted than higher tech approaches, even when the former is based on solid evidence
- Rare incidence of technology abandonment

Lessons Learned - 4

- **Economic Development Trap**
 - Capital investment from providers makes new technologies available
 - Provider ownership strongly influences the utilization pattern of imaging, pathology, and radiation oncology
 - Technology substitution vs. market expansion (overtreatment ↑)
 - Can we curb the diffusion curve of new technology to reflect evidence of value?

Lessons Learned - 5

- Organized effort to incorporate value in payment/coverage decision
 - CTAF value based payment model
 - MA BC guideline
- Methods of economic evaluation provides analytical tools to 'quantitatively' assess values, e.g., cost-effectiveness, budget impact analysis
- Appropriate number of facilities: patient complexity, beam availability, staff experience (learning curve)
- Census modeling study: # sports team ~ # proton rooms, several markets at risk of excess capacity

Lessons Learned - 6

- Ongoing multi-center trials assessing proton vs. IMRT
 - Key to success: collaboration
 - Coverage can facilitate/hinder accrual
- Evidence generating
 - Challenges in technology trials: regulatory, cultural, logistical/practical, statistical design
 - Alternatives: causal inference: confounder adjustment, propensity score, instrumental variable analysis

Challenges in Assessing “Value” in Cancer Care

- Cancer exceptionalism – a well-justified sense of urgency to treat
- Treatment itself can be harmful
- Payment structure creates financially-motivated practice patterns
- Pressure to provide the new treatment
- New cancer treatments are among the most novel but also most costly treatments in medicine

Moving Forward

1. Better data

- Integrated database to enhance quality and opportunities of CER
- National registry

2. Adaptive reimbursement Policy

- Coverage with evidence development (CED)
- Promising approaches: delivery system innovation, and evidence generation linked to reimbursement

3. Better study design

- Innovative study design
- Dynamic design that aligns phases of evaluation with product cycle
- International trials

4. Regulatory channel

- General purpose approval
- Modified Stark Law

5. Listen to patients' voice

6. Increase NIH funding

THANK YOU!!!