2018 AAMD PLAN STUDY
5 FIELD BREAST CASE

Bruce Phillips, CMD, RTU
Thomas Costantino, MS, CMD, RTU
Brent Murphy, MS, DABR, RTU
James Wheeler, MD, PhD, RTU

OUTLINE

1. HISTORY
2. PURPOSE
3. WHAT ARE WE STUDYING?
4. METHODS
5. COMPLEXITIES AND CONSIDERATIONS
6. RESULTS AND DISCUSSIONS
7. CONCLUSIONS
HISTORY


Vicki LaCerba, CMD
(pictured here with husband Matt)

Ben Nelms / Canis Lupus LLC

Goshen Hospital (IN)

RADIATION ONCOLOGY RESOURCES

HISTORY

ROR and Ben Nelms, Ph.D.


AAMD Head & Neck
AAMD GYN
AAMD Prostate Fossa
AAMD Lung
AAMD Abdomen
AAMD Anus
AAMD Breast
AAMD Brain/ Hipo
AUS PUG Head & Neck
AUS PUG GYN
AUS PUG Brain
ASTRO PUG Head & Neck
AAPM Lung SBRT
Studying **history can provide us** with insight into our cultures of origin as well as cultures with which we might be less familiar, thereby increasing cross-cultural awareness and understanding.
What have other Plan Studies shown us?

1. No correlation with:
   - Certification
   - Education Level
   - Experience
   - Confidence
2. No major significance on TPS
3. No dependency of plan complexity
4. Dependency is more on Planner Skill

PURPOSE

HISTORICALLY:
- COMPARE DIFFERENT SYSTEMS
- COMPARE MODALITIES
- IDENTIFY BEST PRACTICES
- SHARE INFORMATION WITH THE WORLD

NEW CONSIDERATIONS:
- ESTABLISH CLINICAL STANDARDS
- LEARN PROCESSES

ULTIMATE GOAL = DRIVE OUT VARIATION AND IMPROVE PLAN QUALITY
WHAT ARE WE STUDYING: VARIATION

VARIATION IN TREATMENT PLANNING IS NOT GOOD

Within A System
Within A Center
Within a Planner

VARIATION IS A BY PRODUCT OF IMPERFECT METHODS AND/OR PROCESSES

Dosimetry is an ART but we need Standards and Processes

VARIATION: MEASURED QUALITY

High variation
Average quality is low
Lots of low quality items
Few high quality items

Lower variation
Average quality is higher
Fewer low quality items
More high quality items
Are We Lowering Variance?

Plan Studies Suggest We Are Lowering Variance! That’s Good.

But are we really?

- 200 – 400 planners per study
- 8,000 planners worldwide
- That is 2.5% - 5% Participation
- What would the distribution of scores really look like? I strongly suspect a LARGE VARIATION.

Continue the Push!
- Sharing is Caring. Education is Key.
- We need to find the time!
WHAT DOES IT MEAN TO GET A MAX SCORE?

What Does It Mean to Score a 150 on the Plan Study?

1. Were the constraints of the study to easy?  
   Answer
2. Are the planners just getting better?  
   Answer
3. Is a score of 150 better than 145?  Answer
4. Is this difference clinically relevant?  Answer

Need for New Protocols  
Need to Tie Score to Toxicity  
Need for Physician Engagement
**METHODS: PROJECT PLANNING TEAM**

<table>
<thead>
<tr>
<th>TEAM MEMBER</th>
<th>AFFILIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAMES WHEELER, MD, PHD</td>
<td>CENTER FOR CANCER CARE, GOSHEN HEALTH</td>
</tr>
<tr>
<td>BRUCE PHILLIPS, CMD</td>
<td>RTU INSTRUCTOR / TA</td>
</tr>
<tr>
<td>THOMAS COSTANTINO, MS, CMD</td>
<td>RTU FACULTY</td>
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<tr>
<td>SANJEEL PATEL, MS, CMD</td>
<td>RTU INSTRUCTOR / TA</td>
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<tr>
<td>BRENT MURPHY, MS, DABR</td>
<td>RTU FACULTY</td>
</tr>
<tr>
<td>DAVID LITTLEJOHN, CMD</td>
<td>RTU INSTRUCTOR / TA</td>
</tr>
</tbody>
</table>

**METHODS: THE DATASET**
**METHODS: The Prescription**

1. RX Dose: 5 Targets: 25 fx x 2 Gy/fx
2. Decision to Not Include the Boost
3. Variability in Boost
   * Integrated vs Successive
   * VMAT, IMRT, Other
   * Photons, Electrons, Mix
4. Ultimately, the composite plan is most important

**COMPLEXITIES AND CONSIDERATIONS**

1. Variation of Technique
2. Inclusion of IMN
3. Hot Spots / Cold Spots
4. Skin Dose
5. Integral Dose
VARIATION OF TECHNIQUE

1. Modality
   - Photon
   - Proton
2. Techniques
   - VMAT / IMRT
   - VMAT / IMRT with 3D Electronic Compensation
   - 3D Field in Field
   - 3D Wedges

INCLUSION OF IMN

1. Controversy

2. Length: Depends on protocol.

3. How do you treat?
HOT SPOTS / COLD SPOTS

1. Hot Spots
   * Physicians are now pushing more for homogeneity of breast cases.
   **Hot Spots created by weighting, wedging, modulation, other.
   *** Moving from no breast target to Breast PTV target (contouring)

2. Cold Spots
   * Historical Matching
   * Skin / Build Up Area

SKIN DOSE

1. Definition of the Skin
2. Skin Dependency
3. What affected skin dose:
   - PTV defined
   - Modulated beams
   - Mixed Energies
   - Obliquity Effect
INTEGRAL DOSE

1. Integral Dose Defined
2. General Concept: Lower Integral Dose is Better.
3. Should it be limited?
4. How do we monitor over 15-20 years?

MD Concerns (Dr. Wheeler)

1. Target Coverage: 5 Targets
2. Heart Dose: Mean Dose, Vessels
3. Lung Dose
4. Rib Dose
5. Esophagus
6. Skin Dose: Definition
7. Other Metrics
   * Conformation
   * Dose Homogeneity
   * Integral Dose
A PHYSICIAN’S PERSPECTIVE

Methods: Plan Scoring

- **Identify Critical Metrics.** Dose, DVH, or formulaic metrics selected from a vast library of options.
- **Define Each Metric’s Parameters.** Select applicable structure, dose- or volume- levels, or other input parameters to derive the metric result.
- **Define Each Metric’s Scoring.** For each metric, capture what defines success, i.e. specify priority along with: 1) minimally required result, 2) ideal result, and 3) variable scoring in between.
## Methods: The Plan Objectives

<table>
<thead>
<tr>
<th>Key Metrics</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 Key Metrics</td>
<td>150</td>
</tr>
</tbody>
</table>

### Library of Available Metrics

- **D(\text{Gy})**
- **V(\text{cc})**
- **ROI Min(\text{Gy})**
- **ROI Max(\text{Gy})**
- **ROI Mean(\text{Gy})**
- **Global Max(\text{Gy})**
- **Global Max Loc**
- **Vol(\text{cc})** of Regret
- **Irradiated Vol(\text{cc})**
- **Serial Slice Eval**
- **\sum MU**
- **Beam On Time**
- **Conformation Number**
- **Conformality Index**
- **Homogeneity Index**
- **Inhomogeneity Index**

### Example of Metrics

<table>
<thead>
<tr>
<th>Metric ID</th>
<th>Metric (cc)</th>
<th>Weight</th>
<th>Points</th>
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<tbody>
<tr>
<td>1.15</td>
<td>V(\text{cc}) 10% of the IMRT_PTV, covered by 97% (cc)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>1.16</td>
<td>D(\text{Gy}) 50% of the IMRT_PTV, covered by 50% (Gy)</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>1.17</td>
<td>V(\text{cc}) 10% of the IMRT_PTV, covered by 97% (cc)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>1.18</td>
<td>D(\text{Gy}) 50% of the IMRT_PTV, covered by 50% (Gy)</td>
<td>40</td>
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<tr>
<td>1.19</td>
<td>V(\text{cc}) 10% of the IMRT_PTV, covered by 97% (cc)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>1.20</td>
<td>D(\text{Gy}) 50% of the IMRT_PTV, covered by 50% (Gy)</td>
<td>40</td>
<td>40</td>
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<tr>
<td>1.21</td>
<td>V(\text{cc}) 10% of the IMRT_PTV, covered by 97% (cc)</td>
<td>50</td>
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<tr>
<td>1.22</td>
<td>D(\text{Gy}) 50% of the IMRT_PTV, covered by 50% (Gy)</td>
<td>40</td>
<td>40</td>
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</table>
Plan Quality Algorithm

- **24 Scored Metrics**
  - 150 Point Totals
  - Target Coverage accounted for 103 of 150 points
  - 24 of 24 used advanced, non-linear scoring
- **4 Unscored Metrics**
  - Conformation Number (PTV All)
  - Homogeneity Index (PTV All)
  - Integral Dose to Body
  - Cumulative Meterset

**METHODS: EXAMPLE PLAN SCORESHEET**

[Table showing various metrics and scores]
SANITY CHECK: HIGH QUALITY VMAT/IMRT

**VMAT**
- Summary: 4 Arcs
- Total Score: 124.00 / 150.0
- Min. Req. Met: 23 / 24

**IMRT**
- Summary: 11 Beams
- Total Score: 144.39 / 150.0
- Min. Req. Met: 23 / 24

RESULTS

If You Don’t Measure It, You Can’t Manage It
Learning Objectives

- Participation
- Overall Score Distribution
- Ideal VS. Minimum Metrics
- Individual Metrics
- Photons vs. Protons
RESULTS: PARTICIPATION BY TPS

![Diagram showing participation by TPS systems, with Eclipse at 51%, Monaco at 17%, RayStation at 14%, Pinnacle at 11%, and other systems.]  

RESULTS: PARTICIPATION BY MODALITY

![Diagram showing participation by modality, with VMAT at 42%, IMRT at 39%, Proton at 13%, Tomotherapy at 3%, and Other at 2%.]
RESULTS: SCORE DISTRIBUTION (ALL)

Histogram of Total [POINTS]
N: 240 | Min: 108.43 | Max: 150.00 | Median: 142.31 | Mean: 138.93 | Std Dev: 10.52

RESULTS: Photons VS Protons

Histogram of Total Points for Photons
N: 200 | Min: 108.43 | Max: 150.00 | Median: 142.31 | Mean: 138.93 | Std Dev: 10.44

Histogram of Total Points for Ion Beam
N: 31 | Min: 125.25 | Max: 150.00 | Median: 150.00 | Mean: 152.17 | Std Dev: 2.73
If You Don’t Measure It, You Can’t Manage It

RESULTS: MEETING IDEAL REQUIREMENTS

<table>
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<th># Ideal Requirements Achieved</th>
<th>N</th>
<th>%</th>
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<td>24 (out of 24)</td>
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<td>23</td>
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<td>22</td>
<td>10</td>
<td>4.2</td>
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<td>21</td>
<td>4</td>
<td>1.7</td>
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<td>20</td>
<td>7</td>
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<td>19</td>
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<td>&lt; 19</td>
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<td>71.6</td>
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## RESULTS: MEETING MIN REQUIREMENTS

<table>
<thead>
<tr>
<th># Min Requirements Achieved</th>
<th>N</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>24 (out of 24)</td>
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<td>54.2</td>
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<tr>
<td>23</td>
<td>30</td>
<td>12.5</td>
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<tr>
<td>22</td>
<td>14</td>
<td>5.8</td>
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<tr>
<td>21</td>
<td>20</td>
<td>8.3</td>
</tr>
<tr>
<td>20</td>
<td>14</td>
<td>5.8</td>
</tr>
<tr>
<td>19</td>
<td>9</td>
<td>3.8</td>
</tr>
<tr>
<td>&lt; 19</td>
<td>23</td>
<td>9.6</td>
</tr>
</tbody>
</table>
METRIC: BREAST_PTV_EVAL

Histogram of [Q1] Volume (%) of the BREAST_PTV_EVAL covered by 47.5 (Gy)
N: 240 | Min: 91.01 | Max: 100.00 | Median: 97.40 | Mean: 97.53 | Std Dev: 1.30

METRIC: BREAST_PTV_EVAL

Histogram of [Q3] Dose (Gy) covering 0.03 (cc) of the BREAST_PTV_EVAL
N: 240 | Min: 91.01 | Max: 97.01 | Median: 95.72 | Mean: 95.91 | Std Dev: 1.02
METRIC: LUMPEC_PTV_EVAL

Histogram of [04] Volume (%) of the LUMPEC_PTV_EVAL covered by 47.5 (Gy)
N: 240 | Min: 97.26 | Max: 100.00 | Median: 99.81 | Mean: 99.68 | Std Dev: 0.45

METRIC: LUMPEC_PTV_EVAL

Histogram of [06] Dose (Gy) covering 0.03 (cc) of the LUMPEC_PTV_EVAL
N: 240 | Min: 51.08 | Max: 60.62 | Median: 54.65 | Mean: 54.85 | Std Dev: 1.33
BREAST_CONTRA: Photons vs Protons

METRIC: HEART: Photon vs Proton
METRIC: LUNG_IPSI: Photon vs Proton

Histogram of [20] Volume (%) of the LUNG_IPSI covered by 5 (Gy) for Photon
N: 200 | Min: 38.76 | Max: 64.24 | Median: 50.59 | Mean: 55.89 | Std Dev: 8.24

Histogram of [20] Volume (%) of the LUNG_IPSI covered by 5 (Gy) for Ion Beam
N: 20 | Min: 21.10 | Max: 64.19 | Median: 35.30 | Mean: 36.36 | Std Dev: 8.43

POPULATION DVH: LUNG_CONTRA

Histogram of [22] Volume (%) of the LUNG_CONTRA covered by 5 (Gy) for VMAT
N: 31 | Min: 4.74 | Max: 30.16 | Median: 4.63 | Mean: 7.21 | Std Dev: 8.87

Histogram of [22] Volume (%) of the LUNG_CONTRA covered by 5 (Gy) for IMRT (Dynamic)
N: 32 | Min: 0.01 | Max: 25.12 | Median: 3.03 | Mean: 4.11 | Std Dev: 5.11
HOMOGENEITY INDEX (PTV ALL)

Integral Dose to Body
If You Don’t Measure It, You Can’t Manage It
RESULTS: INDIVIDUAL

- First, a word about individual recognition.
- List of high performers
- “Best in Class” mentions

RESULTS: HIGH PERFORMERS (145+)

Rolland Julien
Drew Granatowicz
Louis Genet
Charbel Attieh
Irina Fotina
William Starbuck
Charbel Attieh
Sergey Rusetkiy
Paul Barry
Luke Mackowiak
Wanglu
Wesley Zoller
Alex Goughenour
Amber Bryant
Anthony Magliari
Ben Robison
Brent Bachmann
Brian Neal
Dennie Fransen
Erin Gittings
James Henry
Jeff Stamper

Jennifer Sillings
Joakim Nilsson
Joe Simmons
Karla Leach
Keitt Mobile
Kevin Erhart
Kevin Sine
Laura Cutler
Nicolas Depauw
Reynald Vanderstraeten
Scott Petro
Shea Gans
Valerie Coffman
Wuyifan
Brandon Stone
Tiffany Shieder
David Ly
Hongdong Liu
Yuriy Filippov
Richard “Able” Shores
Noriufumi Mizuno

Daniel Eiler
Ian Zoller
Nguyen Daniel
Mok To Wing
Adriè Marè
Caocan
Tongkaïze
Kirsten
Nick Hutchinson
Chavanon Apinoraethkul
Roberto Pellegrini
Timothy Hancock
Takuya Ito
Mark Addington
Kirby DeLozier
Jonathan Stenbeck
Ontida Apinoraethkul
Alejandro
Wesley Groves
Adalicia DeGroff
Juan Maria Perez Moreno

Khaled Khatib
Yasuyuki
Nakagawa
Ted Hoene
Shaomin Zhang
Hilarie Simpson
Shane Hagler
Kai Leung Li
Dalibor Lojko
Mary Headley
Angel
Megan Tattersall
Jason Edwards
Yuuta Miyake
Hedouane
Ruth Crawford
Lauren
Anthony Magliari
Mikhail Kuznetsov
Rachel
Nathan Corradini
## RESULTS: “TOP 10 STUDENTS”

<table>
<thead>
<tr>
<th>Name</th>
<th>Program</th>
<th>TPS</th>
<th>Modality</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amber Bryant</td>
<td>RTU-VT</td>
<td>Ray Station</td>
<td>Proton</td>
<td>150.00</td>
</tr>
<tr>
<td>Erin Gittings</td>
<td>RTU-VT</td>
<td>Ray Station</td>
<td>Proton</td>
<td>150.00</td>
</tr>
<tr>
<td>Laura Cutler</td>
<td>RTU-VT</td>
<td>Ray Station</td>
<td>Proton</td>
<td>150.00</td>
</tr>
<tr>
<td>Hongdong Liu</td>
<td>Univ of Sci/Tech of China</td>
<td>Ray Station</td>
<td>Proton</td>
<td>149.83</td>
</tr>
<tr>
<td>Shane Hagler</td>
<td>MD Anderson</td>
<td>Pinnacle</td>
<td>VMAT</td>
<td>147.25</td>
</tr>
<tr>
<td>Ruth Crawford</td>
<td>SIU</td>
<td>Eclipse</td>
<td>IMRT</td>
<td>146.20</td>
</tr>
<tr>
<td>Rachel</td>
<td>Thomas Jefferson</td>
<td>Pinnacle</td>
<td>IMRT S/S</td>
<td>145.67</td>
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<tr>
<td>Praveen Kumar Nukasani</td>
<td>RTU-VT</td>
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</tr>
<tr>
<td>Sarena Eves</td>
<td>SIU</td>
<td>Pinnacle</td>
<td>VMAT</td>
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<tr>
<td>Benjamin Mowbray</td>
<td>SIU</td>
<td>Eclipse</td>
<td>STATIC</td>
<td>142.80</td>
</tr>
</tbody>
</table>

## RESULTS: “BEST IN MU EFFICIENCY”

<table>
<thead>
<tr>
<th>Name</th>
<th>Site</th>
<th>Technique &amp; MU</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROLLAND Julien</td>
<td>IPC CHICAS</td>
<td>VMAT 566 MU</td>
<td>150</td>
</tr>
<tr>
<td>Drew Granatowicz</td>
<td>Nebraska Medicine</td>
<td>IMRT (Step-and-Shoot) + VMAT 812 MU</td>
<td>150</td>
</tr>
<tr>
<td>Louis Genet</td>
<td>Elekta</td>
<td>VMAT 842 MU</td>
<td>150</td>
</tr>
<tr>
<td>Charbel Attieh</td>
<td>KHUH</td>
<td>IMRT (Dynamic) 869 MU</td>
<td>150</td>
</tr>
</tbody>
</table>
**RESULTS: INDIVIDUAL DATA ANALYSIS**

1. Sign in to [www.proknowsystems.com](http://www.proknowsystems.com)
2. Go to “Plan Studies” and set the filter to “All Studies”
3. Select the 2018 AAMD/RSS Plan Study
4. Select the “Statistical Analysis” tab
5. View your plan’s result relative to the entire population of submitted plans
   - For **Total Score (out of 150)**
   - For **Any Individual Metric (Gy, %, cc, etc.)**

What does all this “BIG DATA” mean?
Historical Perspective

“I believe that the more you know about the past, the better you are prepared for the future.”

~ Theodore Roosevelt

Traditional 4 field mono-isocentric breast
Beams Eye View

Typical high tangent with iso just inferior to humeral head

Scf field 15 degree angle with humeral head blocked

Traditional PAB with 20 cGy added per fraction to achieve 45 Gy at axillary fossa

Field Placement

Ports designed to pick up contoured PTV’s while still maintaining the traditional setup
Although there is good coverage of the breast tissue, the SCF, IMN, and Axillary volumes do not receive the full dose. (Yellow Arrow) Also ipsilateral lung dose is high due to inclusion of IMN in the tangent ports. (Red arrow) Contra-lateral lung dose is very low with no beam exit (white arrow) but contra-lateral breast is partially included in the deep tangent medially to pick up the IMN.

Dose at axillary fossa visually is 45-47.5 Gy.
Homogeneity and conformality

Dose is homogenous but not very conformal to the contoured targets due to use of tangential ports only.

Plan Study Score = 83.26

Score for the traditional plan is very low at 83.26 as the IMN, SCF, and Axillary contours were not covered. Also ipsilateral lung, heart, and contralateral breast minimums were not achieved for this study.
Comparison traditional to IMRT multi-field

The multi-field IMRT plan on the right is not very homogeneous or conformal. The traditional plan is more visually appealing.

Comparison DVH traditional to IMRT multi-field
Comparison traditional to IMRT multi-field

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>Case_1</td>
<td>Unplanned</td>
<td>FF_Multislice</td>
<td>Planned</td>
<td>4000x1000</td>
<td>4000</td>
<td>100.0</td>
<td>100.0</td>
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<tr>
<td>2</td>
<td>Case_2</td>
<td>Unplanned</td>
<td>FF_Multislice</td>
<td>Planned</td>
<td>4000x1000</td>
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<td>100.0</td>
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<td>100.0</td>
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<td>3</td>
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<td>FF_Multislice</td>
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<td>FF_Multislice</td>
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<tr>
<td>5</td>
<td>Case_5</td>
<td>Unplanned</td>
<td>FF_Multislice</td>
<td>Planned</td>
<td>4000x1000</td>
<td>4000</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
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<tr>
<td>6</td>
<td>Case_6</td>
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<tr>
<td>7</td>
<td>Case_7</td>
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<td>FF_Multislice</td>
<td>Planned</td>
<td>4000x1000</td>
<td>4000</td>
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<tr>
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<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>10</td>
<td>Case_10</td>
<td>Unplanned</td>
<td>FF_Multislice</td>
<td>Planned</td>
<td>4000x1000</td>
<td>4000</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Comparison traditional to IMRT multi-field
Other modalities:

Proton, VMAT, IMRT all had a perfect score utilizing the same treatment planning system.

PROTON 4 beam
IMRT 9 fields

VMAT 2 ARCS
Traditional 4 field

Does number of proton beams make a visual difference?
Proton 1 beam

Single Beam: ~120 seconds beam on time (includes layer switching): G=30, T=0

Amber Bryant, Erin Gittins, and Laura Cutler RTUVT

Proton 1 beam

Amber Bryant, Erin Gittins, and Laura Cutler RTUVT
Proton 2 beam

2 Beam Plan: ~250 seconds beam on time (includes layer switching):
Beam 1: G=0, T=0;  Beam 2: G=38, T=0

Amber Bryant, Erin Gittins, and Laura Cutler RTUVT
PROTON 4 beam

Motion and practicality

1. Use of breath hold and importance with modulation

2. Practical treatment times considering motion management techniques.

3. Planning time
Conclusions and more questions

Based on the outcomes of this small study N=240 It is clear dosimetrically, that modulated fields which ever modality, can achieve better target coverage as well as OAR sparing when compared to traditional approaches.

So why are we still using the old techniques?

Do these new abilities translate to better clinical outcomes?

This study based on NSABP-B51.

Maybe a new study utilizing the latest techniques with a higher metric standard should be initiated.

Conclusions and more questions

This can be very difficult!

Phantom II randomized trial
Ten years results of the Canadian breast intensity modulated radiation therapy (IMRT) randomized controlled trial

Conclusions
Breast IMRT cannot be recommended for all patients to reduce long-term side effects. However, late toxicities were significantly correlated with acute side effects, which are increased in patients having poor dose distribution. Breast IMRT may hence be useful for selected patients.

Radiotherapy and Oncology
Volume 121, Issue 3, December 2015, Pages 414-419
Conclusions and more questions

Insurance and resistance to payments

- Comparison plans? Really needed?
- Proof needed?
- Challenge ASTRO and physicians
- Accepting technology and using it to our patient’s advantage

CONCLUSIONS: What Do We NEED?

- More Participation of Planners
- Drive Out Variation
- Physician Input
- Tools for Benchmarking
- New Protocols
- Repository of Data / Plans
- Constant Communication / Training
- Big Data Analytics (how to utilize)
Tips & Techniques

• Interviews of High Performers to be conducted and shared On-Line on the ProKnow Website

Thanks

• AAMD
• MDCB
• ProKnow
Questions and Answers

- Questions and Answers
- Share Your Physician’s Opinion
- Share Your Tips / Tricks

- HOW DO YOU TREAT?