ASCO’s Quality Training Program

Project Title: Increasing on Time Treatment Plan Delivery in Radiation Medicine

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Jo Price, RT(T)

Institution: Oregon Health & Science University Knight Cancer Center

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Oregon Health and Science University is the state’s only academic health center. It includes OHSU Hospital and Doernbecher Children’s Hospital with a combined 576 beds.

In 2015 the hospital saw more than 1 million patient visits. More than half of the hospitalized patients are either uninsured or insured through a public payer.

Radiation Medicine at OHSU treated 1,108 patients last year.
Team Members

Jerry Jaboin, MD, PhD
Vice-Chair for Clinical Affairs
Team Leader

Simon Brown, MD
Year 3 Resident

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Clinical Associate Professor
Therapeutic Radiation Physics

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Medical Dosimetrist

Jo Price, RT(T)
Lead Radiation Therapist

Jennifer Ruocco, PhD
Director of Radiation Oncology

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Chief Radiation Therapist

Stephanie Junell, PhD
Medical Physicist

Jeff Hanson
Finance and Operations Manager

Champions

Charles Thomas, MD
Professor and Chair

Kevin Billingsley, MD
Chief, Division of Surgical Oncology

Ellen Distefano
Quality Management
Sixty-two percent of final Physics Quality Assurance (PQA) approvals for treatment plans (including 3D/IMRT/Arc/SBRT/SRS plans) are not completed by 8:00 am the day prior to the patient’s first treatment appointment.
Cause & Effect Diagram

Ishikawa Groupings

CT SIMULATION
- Late
- On Time
- Order
- Multi Image
- Machine Down
- Incorrect Scan
- Incomplete Scan
- Change in Pt. Condition

DICOM-RT
- Field Mismatch
- Patient Not In Room
- Review
- BIRN Review
- Rescan
- Rescanned Scan
- Change in Scan

IMAGE FUSION
- Field Mismatch
- Patient Not In Room
- Review
- BIRN Review
- Rescan
- Rescanned Scan
- Change in Scan

NORMAL CONTOURS
- Defined Patient
- Contour Validation
- Contour Definition
- BIRN Protocol
- Color Standards
- Worked Bock
- Billing Issues
- Decision-Making
- Systems
- Protocol
- Identifying Protocol
- Visual Management

TUMOR VOLUMES
- Resident Contouring
- Attend Contouring
- BIRN Protocol
- Phys Check
- Physician Availability
- Tech - Visual Management
- Physician Attendance
- Attending Education
- Resident Education
- Attend Contouring
- Remote Contouring

OTHER

PLANNING ORDERS

TX PLANNING

PHYSICIAN REVIEW

QUALITY ASS.

Deliver On Time Plans

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Diagnostic Data

6 Month Tracking Period

All Data points retrieved by Mosaiq

Of 1071 patient plans completed approximately 62% were completed at 8 am prior to the start of treatment.

<table>
<thead>
<tr>
<th>Attending</th>
<th>Patient Count</th>
<th>% Ready for Therapist QA by 8am day before New Start</th>
<th>Average CT to New Start (h)</th>
</tr>
</thead>
</table>
Aim Statement

Our rate of on time treatment planning delivery is a dismal 62% for all providers and 68% for the two providers we are tracking.

By January 2017, 90% of plans for those two providers will have final physics quality approvals completed by 8 am the day prior to the patient’s start of treatment.
• **Measure:** Percentage of plans ready for therapist QA by 8 AM the day before New Start

• **Patient population:** Non-emergent radiotherapy patients

• **Data sources:** Mosaiq radiation therapy program and whiteboard Abnormality Tracker

• **Data collection frequency:** Daily

• **Calculation methodology:** MOSAIC QCL Scripting for task completions.

• **Data quality(any limitations):** Limitations dependent on data not automatically collected.
Intangible Measures

Ah ha Moments…

• “Boy the CT sim initiates and manages a large number of processes”

• “I had no idea Physics did that”

• “I could not believe how much workflow is managed by the residents”

• “The brainstorming process itself was really enjoyable”

• “We need to really work on reducing the load on Dosimetry”
Baseline Data via xMR Chart
(Percent Plans Completed by 8am)

Positive = Achieved PQA
8:00am PQA Target
Negative = Beyond target time or “Late”

68%
## PDSA Plan (Test of Change)

<table>
<thead>
<tr>
<th>Date of PDSA Cycle</th>
<th>Description of Intervention</th>
<th>Results</th>
<th>Action Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 13, 2016</td>
<td>Morning Hallway Whiteboard Huddle required commitment from all department divisions (subgroups)</td>
<td>Visual hallway Whiteboard didn’t provide consistent understanding or knowledge of it’s purpose and information wasn’t disseminated</td>
<td>Presented the project to all members of the department.</td>
</tr>
<tr>
<td>October 13, 2016</td>
<td>Simulation contour schedule</td>
<td>Attending's understood required times for plan completion. Big improvement in goal.</td>
<td>Additional Visual management tool</td>
</tr>
<tr>
<td>November 3, 2016</td>
<td>Dosimetry Digital QCL Whiteboard Tracking Monitor</td>
<td>Dynamic display of project workflow (contour completion)</td>
<td>Another method to communicate task workflows.</td>
</tr>
<tr>
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</tr>
<tr>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>December 7, 2016</td>
<td>Screen capture of digital dosimetry whiteboard email sent out daily to Attending’s</td>
<td>Clearer understanding of pending work</td>
<td>Communicate the Attendings workflow to their assigned Residents</td>
</tr>
<tr>
<td>December 20, 2016</td>
<td>Residents added to digital dosimetry whiteboard daily email.</td>
<td>Pending</td>
<td>To Be Determined</td>
</tr>
</tbody>
</table>
Prioritized List of Changes (Priority/Pay – Off Matrix)

<table>
<thead>
<tr>
<th>Impact</th>
<th>Easy</th>
<th>Difficult</th>
</tr>
</thead>
</table>
| High    | Digital Whiteboard  
           Daily Email | Digital Whiteboard |
| Low     | Sim to Start Schedule | Daily Huddle |

Ease of Implementation
Materials Developed

Dosimetry Digital Whiteboard

Simulation to Start
Schedule Workflow

Daily email to Attendings/Residents

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Post-Intervention Data

xMR Chart

- Positive = Achieved PQA
- Negative = Beyond target time or “Late”

- First intervention on October 13th, 2016
- Second intervention on November 3rd, 2016
- Third intervention on December 7th, 2016

83%  71%  100%

Patients

Time in hours from PQA Target

- 0
- 50
- 100
- 150
- 200
- 250

- 100
- 50
- 0

- Hours
- Baseline Mean
- Lower Control Limit
- Upper Control Limit

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Conclusions

• Our data suggests we have reached our goal, but we don’t have sustainability yet. We are on our way to reaching our goal.

• Each intervention resulted in a positive change, but more interventions were required.

• We need to identify more steps to reach our goal for all providers and maintain it.
Next Steps/Plan for Sustainability

• Continue process and identify future interventions
• Run xMR chart for last pending PDSA
• Implement process to include all providers
• Hold quarterly meetings
**Increasing On-Time Treatment Plan Delivery in Radiation Medicine**

**AIM:** Our rate of on time treatment planning delivery is a dismal 62% for all providers and 68% for the two providers we are tracking. By January 2017, 90% of plans for those two providers will have final physics quality approvals completed by 8 am the day prior to the patient’s start of treatment.

**INTERVENTION:**
- Recorded the time (in hours) from planning CT Simulation to treatment Start
- Recorded success rate of achieving PQA by 8am the business day prior to treatment start
- Created a cause-and-effect analysis via Ishikawa groupings
- Implemented visible flow chart and patient log with time points to assist providers with planning and scheduling
- Using the PDSA method we implemented a digital whiteboard tracking monitor and an alert system to notify providers of incomplete contours.

**RESULTS:**

**CONCLUSIONS:**
- Our data suggests we have reached our goal, but we don’t have sustainability yet. We are on our way to reaching our goal.
- Each intervention resulted in a positive change, but more interventions were required.
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**NEXT STEPS:**
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Thank you