Two Year Experience with LEAN Thinking In Radiation Oncology @ Baylor Scott and White Health

My Lecturing Objective

- To convince
  - Lean methodology is an ‘idea’ creating machine
  - Lean thinking
    - Simple & effective
    - Improves patient care & satisfaction
    - Staff engagement & satisfaction
    - Reduces cost & improves revenue

- To Inspire all of you
  - with our stories
  - to encourage become lean thinker and leaders

Radiation Oncology Department (CTX)

- Clinical Sites
  - 3: Temple, Killeen, Waco

- Team
  - Number of Physicist: 8
  - Number of Dosimetrist: 6
  - Radiation Oncologist: 7
  - Number of Nurses: 6
  - Number of Therapist: 12

- Patients
  - Approx. 1500 New patients/year

- Machine
  - 4 Linacs all IGRT (1 Novalis and 3 Truebeams)
  - 2 HDR units (1 Varian and 1 Nucletron)
  - 4 CT Scanners (3 GE and 1 Siemens)

- Clinical
  - HDR, LDR, SBRT, SRS, VMAT Programs

- Education Programs
  - Radiation Oncology Physician Residency Program (ACGME)

- Research Program
  - Detector and real-time Image guidance
  - Process Science, Quality and Safety Research
  - Automation, Data Analytics and visualization
Our Story

- Lean Instructors emphasized
  - Lean is not a tool
  - Lean is not a check list item
  - Lean is not a project
- Lean is a way of thinking which needs a culture to thrive

What We Lean Thinkers Do at BSW?

- Gemba Walk
- Daily Huddles
- Visual controls

How to Gemba?

- Go See
  - Purpose, Process, and People
- Ask Why
  - What did you look for when you went to the gemba?
- Show respect
  - When going to see, lean thinking mandates (yes, mandates) that we show respect to all the people

Which leads to the first rule of gemba walking: "Do no harm!"
Gemba Walk (examples)

- Physicist of the Day
- Chairman of the Department – Rounds
- CMO and CEO Gemba Rounds
- Lead Therapist Rounds
- Dosimetrist Manager Rounds

Examples in Our Operation

- No Daily QA completed on time, first patient delayed
- LINAC chiller issue
- Stuff left on the table
- Cable untwined
- Patient starting in 30 minutes, treatment not approved
- IMRT QA not done for early morning patient
- IT networking & server down issue
- PDF issue
- Staff day off and how that affect things

LONG LIST

Daily Huddle

- Example – Physics Huddle ….Every Day 10 minutes stand up huddle
- Day’s scheduled events or noteworthy events of day before
- ONE problem that was found in Gemba or otherwise and seek for an idea
- JUST-DO-IT
- Keep metrics on huddle board, check and act accordingly
Just Do it – What Does It Mean

- Don’t wait to implement
- Pen and Paper would do it
- Don’t need a nice and fancy system
- Data Collection and analytics for quality metrics

Huddle Boards Examples

- Physics and Dosimetry Huddle Boards
- Administrative Board
- Nursing Huddle Board
- Therapist Huddle Board
- Residents huddle Board
- Satellite Clinic Huddle Board

Huddle Board - Examples

Fig. Therapist Huddle Board

Fig. Physics & Dosimetrist Huddle Board
JUST-DO-IT – Huddle Board Items

![Graph showing dose attenuation average workday per week.]

**Dosimetrist average workday per week.**

**Fig. Time Tracking (Dosimetrist Average Workday Per Week).**

**Fig. Patient accelerated from CT to treatment.**

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Near Miss Reporting System

**NEAR MISS (ROOT CAUSE ANALYSIS).**

Date of Occurrence: 6/26/2014

Patient: 
Treatment date: GMG
Machine: CV
Potential Severity: 
Clinical Notes: Psychiatric or HPA
Economic cost: Low

Description:
Patient was scheduled to be treated at 2:30 pm on 6/26/2014. Treatment plan was changed by the Translational Radiation Oncology team pending MMT QA review. Treatment started in morning of 6/26/2014. Patient specific QA was reviewed and signed on 6/29/2014 at Warren and HMT QA documents were uploaded and ready for next day morning. Morning 2013 did not find the HMT QA documents in patient's chart and patient treatment was rescheduled.

Recommendation:
All patient specific QA documents must be uploaded after the QA is delivered.

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Visual Control

**License usage**

**Machine New Starts workload**

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Physician delayed contouring

Next day NEW START
status list

A3 for Replacement Physician Hire
Kaizen Project (Continuous Improvement)

- Examples
  - Reduced CT Sim to treatment timeline
  - Reduced Patient rescheduling for SRS
  - Real-Time LDR Prostate Seed Implant Lean Approach vs Pre-plan Implantation
  - Reduce cancellation and billing rejection

Value Stream Mapping

- SRS Patients w/o delays
  - 95% of cases w/o delays
  - Goal: 95%

Initial Problem Statement

- Reasons for Delays Total
  - Addl consults...
  - CT Down
  - Family Requests
  - Plan not ready
  - Hospitalized
  - Pt noncompliance
  - Pt changed to...
  - Fiducials not ready
  - Insurance issues
  - Pt condition
  - Anes scheduling
  - Left w/o being seen
  - Physician request
  - Transportation
  - Delaying
  - Not started
  - Other (if any):...
Rescheduling Rates

RSR 5/2012- 8/2012  16/144(14.5%)  
RSR 11/2012- 0/13(0%),  12/2012- 1/18(0.05%)

Our Ideas and Kaizen Success

- Top 3 success Ideas
  - Physics Hotline
  - Physician Contour Delays
  - New Start Email List
- Pre Authorization insurance for IMRT patients – Business Office
- Reduced SRS rescheduling rates
- Increase capacity on machine – Additional changing room
- Rapidarc vs IMRT
- Top Kaizen success
  - SRS service
  - LDR & HDR services are streamlined
  ....many more

Conclusion

- Lean thinking is simple & effective
- Lean thinking
  - Improves patient care & satisfaction
  - Staff engagement & satisfaction
  - Reduces cost & improves revenue
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Where?
Why?
What?
When?
Questions

How?