The UCLA Experience, with Focus on Developing Metrics and using RO-ILS

Phillip Beron, MD Chief Medical Quality Officer Radiation Oncology UCLA



Introduction to the Department

- 15 Faculty Physicians
- 13 Medical Physicists
- 1 PhD Computer Scientist and 1 PhD Statistician
- 12 Residents, 2 Physics Residents and 2 Fellows
- 6 DMCO Research Faculty
- Animal Colony
- Irradiation Core

Introduction to the Department

- Brachytherapy
 - 2 brachytherapists
 - 2 fellows
 - •1 PA
 - 2 Dedicated procedure rooms
 - Large Bore Ct Scanner
 - Shielded Treatment room
 - Nucletron HDR remote afterloader



Westwood campus

- 4 treatment machines
 - Tomotherapy
 - Novalis Tx with ExacTrac
 - TrueBeam
 - ViewRay





Clinical services offered

- IMRT
- Rapid arc
- Tomotherapy
- MRI guided therapy- ViewRay
- SRS
- SBRT
- IORT
- Eye plaque
- TBI
- Brachytherapy

UCLA Health System

Santa Monica campus

- Varian true beam accelerator
- GE large bore simulator
- Treatment planning equipment and staff

Both campuses combined

- 110 daily external beam treatments
- 4 5 SBRT daily
- 2-3 SRS daily
- 3 4 brachytherapy treatments daily



Historic Paper Based Incident Reporting System

- Rigorous assessment of whether reportable event had occurred
- Designed for rapid review of events reaching the patient
- Quality team review and sign off within 24 hours

RO-ILS at UCLA

- 6 months duration till Clarity PSO contract finalized.
- Mainly back and forth between attorneys
- Began using RO-ILS in June 2014
- Paper-based method was abandoned

RO-ILS at UCLA

- Introduced in Faculty Meetings
- Education to staff
 - Nursing
 - Front office
 - Therapists
 - Physics
 - •MD's
 - Administration



Weekly Quality Meeting

- Established a voting mechanism to determine if a reportable event occurred within 24 hours of incident.
 - •No mechanism in RO-ILS RE: reportable events
- Reviews all new incidents
- Assigns Champions to all incidents
- Reviews Champion Input
- Good Catch of the Month assigned

<u># incidents per year</u>

Incidents



UCLA Health System

Category/Location of Incidents



Who is reporting?



Person reporting and role



M.D. Reporting

of Incidents Reported







Physicist Reporting

Incidents Reported





Most common Incidents



	Event occurred	Event discovered
Equipment- Software Quality Management	1	1
Imaging for RT Planning	22	5
Patient Assessment	23	16
Treatment Planning	38	6
Pretreatment Review/Verification	50	33
Treatment Delivery	36	23
On treatment Quality Management	11	14
Post Treatment Completion	3	5
	184	114

Type of Incident



Dosimetric Severity





Anatomical Site v Treatment Technique



Did Event Occur in Multiple Patients?





Occurred in Others Vs Type of Incident



Suggestions for improvement

• 96 suggestions for improvement

- Documentation
- Communication
- Time out process
- Changed policy and procedure
- Initiation of A3 projects

Suggestions for improvement



A3 report

ES INDUSTRIAL EXT	ENSION SERVICE
-------------------	----------------

PROBLEM AREA: (Focus on the problem, not the solution.)

WHAT IS THE PROBLEM?

BACKGROUND: (Why is this problem important?)

CURRENT CONDITION: (Draw a diagram that shows how the current system operates and where problems occur.)

DIAGRAM OF THE CURRENT CONDITION

PROBLEM ANALYSIS: @dentify the root cause, not the effect. Use the 5 whys)

TARGET CONDITION: (Draw a diagram that shows the future system where the problem is resolved.)

DIAGRAM OF THE TARGET CONDITION

COUNTERMEASURES: (What are the actual changes you will introduce to the system?)

WHAT CHANGES WILL YOU MAKE?

When

IMPLEMENTATION PLAN:

Who

What

Outcome

IMPLEMENTATION PLAN WHO/WHAT/WHEN?

WHAT ARE THE ROOT CAUSES (5 WHYS)?

COST:		

COST BENEFIT / WASTE RECOGNITION:

Date:

PLOT TEST:

FOLLOW UP: (How willyou measure success?)

HOW WILL YOU MEASURE SUCCESS?

www.ies.ncsu.edu/leanhealthcare/

A3 projects from RO-ILS

- 7 similar Exac trac incidents- resolved
- 4 naming convention- resolved
- 4 Time out incidents- in progress
- 2 email communication- in progress
- Scheduling
- Shift

Naming Convention

- Pre Task Force
 - No Consistency
 - Prost vs Beron_Prostate vs Final Plan Beron
- Initiated Local Task Force
 - •Only Active plans in Tx course of Eclipse
 - All Trials in Separate Course
 - Standardized Plan names

Plan Name Standardization

Plan Name: I/B/S# + L/R + Md + Name + Bl/NB + Blk/NBlk + R#

L/R, Md, Bl/NB, Blk/NBlk, R# used only when applicable

l# = Initial#	L=Left	Name = 4 character Name	BI = Bolus	Block = Blk
B# = Boost#	R = Right	R# = Revision#	NB = No Bolus	No Block = NBlk
S# = SIB#	Md = 2 Char Location Modifier			
Examples:	I1LAcNe	I1WBrnR1	I1TBIBIk	
	B1LBrstBIR1	l1Prst	B2BOTR1	
Name - Long form	Proposed 4 (or less) abbreviation	Location Modifiers - Long Form	Proposed 2 abbr	eviation (Md)
Acetabulum	Actb	Ant	At	
Acoustic Schwanoma / Neuroma	AcNe	Bed	Bd	
Adrenal	Adrl	Body	Ву	
Anal Verge	AVrg	C1 spine	C1	
Anus	Anus	Central	Ct	

<u>____</u>

<u>___</u>



A ... +

Aarta

Naming Convention

- Post Task Force Incidents
 - Errors in using Standardized Naming Template
 - •Type and "Quality" of incident has changed



Exac Trac incidents

- 7 Exac Trac incidents identified-SRS and SBRT
- Radiation Therapists abandoned infrared markers after the first tx day
- Faster to set up to lasers
- Very large and unusual shifts encountered
- Discovered a protocol breach
- 3 month period of time



Pattern Analysis (similar incidents) with the Electronic Incident Learning System –Exac Trac



UCLA Health System

Conclusions

- Potentially serious errors occur in all aspects of workflow
- Potentially serious errors occur in all dz sites
- Potentially serious errors occur in all treatment techniques



Conclusions

- In Depth Analysis Of Incidents thru RO-ILS
- Barriers to overall reporting exist
- Barriers to physician reporting
 32/34 reports from 2 physicians



Conclusions

- Recognition of clusters of similar events
- Quality Improvement initiatives performed in several areas identified in RO-ILS
- No mechanism to evaluate if Reportable Medical Event occurred and track them

Incidents do not occur in which part of the radiation workflow...

- 0% **1.** Simulation
- 0% 2. Pre Treatment Imaging
- 0% 3. Treatment Delivery
- ^{3%} 4. Patient Assessment
- 97% 5. Incidents occur in all parts of the workflow

Incidents do not occur in which part of the radiation workflow...

- 1. Simulation
- 2. Pre Treatment Imaging
- 3. Treatment Delivery
- 4. Patient Assessment
- 5. Incidents occur in all parts of the workflow

Yeung TK, Bortolotto K, Cosby S, Hoar M, Lederer E. Quality assurance in radiotherapy: Evaluation of errors and incidents recorded over a 10 year period. *Radiother Oncol*. 2005;74:283-291.

Implementation of the RO-ILS system requires...

- 13% 1. Application to AAPM and ASTRO
- 48% 2. A contract with the PSO
- 3. An agreement to release patientinformation to other participants
- 32% 4. An agreement to submit all incidents to the PSO
- 2% 5. A Pre-Paid Fee

Implementation of the RO-ILS system requires...

- 1. Application to AAPM and ASTRO
- 2. A contract with the PSO
- 3. An agreement to release patient information to other participants
- 4. An agreement to submit all incidents to the PSO

5. A Pre-Paid Fee

https://www.astro.org/Clinical-Practice/Patient-Safety/ROILS/Index.aspx RO-ILS participants *must comply* with state or federal reporting requirements.

ROI-ILs has a robust process for determining if a radiation event reportable to State or Federal agencies has occurred within what time frame?

1%	1.	12 hours
45%	2.	24 hours
4%	3.	One week
1%	4.	Two weeks
50%	5.	No process exists for determining
		whether a reportable event has occurred

RO-ILS participants *must comply* with state or federal reporting requirements.

ROI-ILs has a robust process for determining if a radiation event reportable to State or Federal agencies has occurred within what time frame?

- 1. 12 hours
- 2. 24 hours
- 3. One week
- 4. Two weeks
- 5. No process exists for determining whether a reportable event has occurre

https://www.astro.org/Clinical-Practice/Patient-Safety/ROILS/Index.aspx