

Standardizing Prescriptions to Improve Patient Safety

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Disclosures

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- These are not related to these efforts.
- Service in AAPM and ASTRO related to Quality and Safety.

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Outline

- Motivation
- · Safety related examples
- Organizational efforts on prescriptions
- · ASTRO white paper on prescriptions
- · Short- and mid-term solutions to improving safety
- Challenges and opportunities for collaboration between manufacturers and users

ICRU 83 & Standards Prescriptions

- Das et al have shown that there is significant variability in the analysis of the ICRU 83 point
- What can we do?
- One of the important roles of prescriptions is clarity in communication
 - Providing enough information to the entire team to deliver the correct plan safely





Courtesy of Larry Marks, UNC

· Accuray's Tomotherapy





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Prescriptions and Safety

- As of Sept 2016, the AAPM ASTRO Radiation Oncology Incident Learning System had 2344 events
- The analysis by the Radiation Oncology Healthcare Advisory Board has identified situations where prescriptions were involved in an event
- · A major contributing factor is miscommunication
- Therefore RO-HAC recommends that the key elements in the ASTRO Standard Prescription White Paper be followed...and in the correct order!

2017 RO-ILS Aggregate Report

Analysis from publicly available Quarterly Reports)					
Event Type	Brief Description				
Wrong energy	Rx for 6 MV; plan for 10 and 15 MV; missed at multiple steps and by people in different roles				
Anatomical site mismatch	MD Rx was for specific vertebral bodies but it did not match those in the treatment fields; dosimetrist caught difference; fields were correct, plan was wrong				
Additional Rx mismatch*	3 events: reversal of the dose/fraction and number of fractions, leading to 180 or 200 fractions				
Communication*	Verbal "12 in 2" interpreted as 2 Gy times 6 fractions instead of 6 Gy times 2 fractions, caught at chart rounds				

*From presentation on 8/1/17, Gary Ezzell, RO-HAC, WG-RO-ILS; see in virtual library

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$\label{eq:RO-ILS: Prescription-related Events} - Extracted from publicly available RO-HAC available Quarterly Reports$

Event Type	Brief Description			
Original intent mismatch	Intended 400 cGy in 5 fractions but delivered (or planned to deliver) 500 cGy in 4 fractions			
Mismatch with plan	Plan: 90% IDL for electron beam; Actual Rx: 100% IDL for electron beam			
Rx not approved	1,000 cGy/fraction SBRT delivered without documented MD approval			
Scheduling error	IMRT 600 cGy x 5 fractions was to be treated daily; 'confused as SBRT treatment and scheduled and delivered every other day'			
https://www.astro.org/uploadedFiles/_MAIN_SITE/Patient_Care/Patient_Safety/RO-ILS/Content_Pieces/Q32016Report.pdf				

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Example Prescription Errors

- From the RO-ILS October 2016 Tip of the Month:
- The physician verbally ordered "12 in 2", intending 2 fractions of 6 Gy, but the planner assumed the intent was 6 fractions of 2 Gy. The plan was prepared and approved for 2 Gyl/fraction and one treatment was delivered. This error was also discovered at chart rounds. (Q1 2016 Report, "Approved plan different from intent")
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https://www.astro.org/uploadedFiles/_MAIN_SITE/Patient_Care/Patient_Safety/RO-ILS/Content_Pieces/ROILSTipoftheMonthOct2016.pdf

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Radiation Oncology Safety Stakeholders Initiative (ROSSI)

- Began in November 2010 in response to the safety concerns
- raised at a joint meeting of users, manufacturers, and regulators • The group is a grass roots effort and focuses on activities to improve patient safety
- Prescriptions were discussed in detail by Dr. Larry Marks at the July, 2012 meeting
- http://info.radoncssi.org/about
- · ROSSI served as an initial incubator
- A formal effort on prescriptions was launched by the ASTRO Multi-disciplinary QA Subcommittee

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Improving Safety

- RO-ILS Report October 2016 "Tip of the Month" use the standard prescription as published in the ASTRO white paper for clarity in communication
- Identify key elements and always present the information in the same way each time

Order of the Key Elements for a RT Prescription							
	Treatment site	Method of delivery	Dose per fraction (cGy)	# of fractions	Total dose (cGy)		
	Right chest wall	Photons	200	25	5000		

*Adapted from Table 2 - Evans et al with an example from Table 1.

Evans, et al. ASTRO White Paper on Standardizing Prescriptions, PRO 6, 2016

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What can we do today in our clinics for safety?

- Communicate in a standard way following the key elements of the prescription
- Use units when communicating verbally and in writing regarding the prescription
- Use pre-treatment peer review to confirm the prescription and plan information are correct

Verifying Prescriptions – Automation to check with the plan					
18		_			
16 - 14 - 12 - 10 -	But what if automation isn't available?	h can be lan check check the h since it's			
3 aquan 8 - 4 - 2 -	What else can be done to support safe prescriptions?	error if pups have these			
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Prescription Reference Point Bolus Dose Rate

One example: Covington et al, Plan checker, JACMP 17, 2016.

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Improving Safety while Adding Value & Efficiency



Younge et al, Therapist pretreatment QA, PRO, In press, 2017.

AAPM Related Guidance

- AAPM Task Group 275 on Plan and Chart Review
 - Being drafted (see Virtual Library Annual Meeting and Spring Clinical Meeting for information on their analysis)
- AAPM Task Group 263 on Nomenclature
 - Completing final review at Science Council
 Rx to volumes with standard labels (see Virtual
 - Library)
- AAPM MPPG 4a on Designing Checklists to Improve Patient Safety (JACMP 16: 2015)

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Challenges to Improving Prescriptions in Our Electronic Workspaces

- Logistical, layout issues
- · Multi-vendor environments that require inter-operability
- Implications on further data sharing down the road to (think Big Data for patient care)
- · Standardizing dose units
 - ASTRO white paper recommends cGy for clarity, especially for verbal communication
 - IEC requires Gy with an exception for cGy in the US alone

Other Organizational Efforts

- · DICOM 7 Work Group
- IEC 62083 work is beginning by the manufacturers on standards for treatment planning system manufacturers on the prescription requirements
- Radiation Oncology Safety Stakeholders Initiative (RO-SSI) – ongoing discussions on how to encourage more communication between users, manufacturers, and those developing standards
- We need you! Please consider volunteering to provide clinical input!

Summary and Conclusions

- · Errors in prescriptions are a known problem in radiation oncology
- National event reporting with the AAPM ASTRO Radiation Oncology – Incident Learning System (RO-ILS) provides meaningful data to evaluate the types of events that are occurring
 - RO-HAC via the quarterly reports has provided some guidance to aid in mitigating some of these errors
 - Data entry by members into RO-ILS helps use better understand the problem
 - Thanks to those who have entered events!

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Summary and Conclusions

- Guidance documents that are recommending standardization will help improve safety
- ASTRO White Paper on Standardizing Dose Prescriptions (PRO)
- · Further guidance is needed for the next phase of standardization
- Manufacturers continue to need user input in this space
 User driven guidance documents, testers, use cases, review
- obside introduction guidance absolutions, toolers, toolers, toolers, of manufacturer standards during open comment periods, etc.
 Please get involved in generating solutions, guiding change, &
- improving communication!