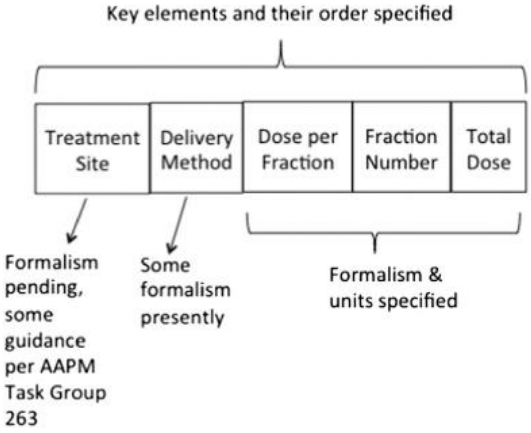
RO-ILS®
RADIATION ONCOLOGY
INCIDENT LEARNING SYSTEM
Sponsored by ASTRO and AAPM

CLARITY PSO
A Patient Safety Organization

TIP OF THE MONTH

October 2016
Standard Prescription

Tip: Utilize a standard prescription, as recently published in an ASTRO white paper, to effectively communicate the treatment prescription and avoid a common error pathway.



Accurate and unambiguous communication among members of the radiation oncology team -- particularly as it relates to the prescription -- is critical to patient safety. Errors relating to prescriptions are well documented in RO-ILS including the examples below.

1. 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 Gy/fraction and one treatment was delivered. This error was also discovered at chart rounds. (Q1 2016 Report, “Approved plan different from intent”)
2. A patient presented for his first radiation fraction, was placed on the table, and during time-out it was realized that this was to be fraction 1 of 180 fractions. The prescription was for 180 cGy x 42 fractions = 7,560 cGy. Instead, the plan that was generated, and subsequently approved by the physician and physics was 42 cGy x 180 fractions = 7,560 cGy. As the total dose was correct, the dose-volume histograms (DVHs) and isodose lines were correct but the fraction size was incorrect. The patient had to be taken off the table and replanned. (Q4 2015 Report, “Fractions and dose inverted”)

As cited in the ASTRO white paper and exemplified in the first case study above, the “increased use of hypofractionation increases the breadth of reasonably acceptable clinical prescriptions and increases

the risk of miscommunication". Utilizing a standardized prescription will reduce the likelihood of similar errors.

White Paper Summary

The "Standardizing dose prescriptions: An ASTRO white paper" (Evans, S. et al) is currently available on the Practical Radiation Oncology website as an "Article in Press". The full article provides rationale, challenges of standardization, and categories beyond the key elements and should be read in its entirety. The following is a summary and excerpt from the white paper.

The standard prescription is focused on a limited number of "key elements". The key elements by themselves do not form a complete directive for treatment delivery, and cannot "stand alone". The key elements are:

1. ***Treatment Site:*** *There is presently much variation in how treatment sites are specified. An American Association of Physicists in Medicine (AAPM) task group (#263) has been charged with making recommendations for standardizing names of structures (targets and normal tissues) to address this variation. The prescribing radiation oncologist should take care to name the treatment site in a manner that allows others to readily understand which portion of the body is to be treated (e.g., "left tonsil and bilateral neck" is preferred over "PTV1"). Laterality should always be included in accordance with current standards, including the recently implemented ICD-10.*
2. ***Method of delivery:***
    a. ***If brachytherapy*** *is indicated, then, consistent with NRC requirements, the isotope type should be specified (e.g., Ir-192, Cs-137).*
    b. ***If external beam*** *is indicated, then, at a minimum it should state "photons," "electrons," etc. However, alternative, more descriptive options that also include things such as energy, technique, or even machine may be desirable. Examples include:*
        i. *6MV photons,*
        ii. *12MeV electrons,*
        iii. *Photons, arc-based IMRT,*
        iv. *Photons, Tangents*
        v. *Photons, VMAT*
        vi. *Photons, Tomotherapy*
        vii. *Cobalt-60, Gamma Knife*
3. ***Dose per fraction (cGy):*** *Due to a number of safety-related advantages of using centiGray (cGy) compared to Gray (Gy), the recommendation is to utilize cGy within the prescription.*
4. ***Fractions***
5. ***Total Dose (cGy)***

Table 1*: A recommended format for the key elements of a radiation therapy prescription

Treatment Site[1]	**Method of delivery[2]**	**Dose per fraction (cGy)**	**Total number of fractions**	**Total dose (cGy)**
Right chest wall	Photons	200	25	5000
Vaginal mucosa	Ir-192	600	5	3000
Left frontal brain	Cobalt-60	1800	1	1800

[*] *Adapted with permission from Marks and Chang, Practical Radiation Oncology (2011) 1, 232-234.*

When there are multiple prescriptions running simultaneously (e.g., treatment to multiple sites or different doses to target subregions via "dose painting/simultaneous integrated boost") each prescription should be defined separately.

Table 3: Example of key elements in a single plan using multiple radiation therapy prescriptions

Treatment Site[1]	**Method of delivery[2]**	**Dose per fraction (cGy)**	**Total number of fractions**	**Total dose (cGy)**
Left tonsil	Photons	200	35	7000
Left neck: retropharyngeal nodes, left levels 1-3	Photons	180	35	6300
Right neck levels 1-4, left neck level 4	Photons	160	35	5600

[1] *The format/style/content of the names herein used to denote Treatment Site are not dictated by this report. An ongoing AAPM effort (TG-263) is addressing the challenging topic of standardizing anatomic and target nomenclature within treatment planning systems. While TG-263 is held to the DICOM dictated character limits for structure names, and the tenet that more-rigid formalism will better enable data pooling, treatment site naming is guided by the first principle of clarity and avoidance of site and side misadministrations. The use of abbreviations and excessively limited characters prevents clarity and is discouraged in treatment site designation. However, within treatment planning systems, where the segmented organ or target is visible, such abbreviations are more intuitive and are a basic tool used with TG-26.*

[2] *The method of delivery is not fully standardized by this work.*

The white paper task force included a multidisciplinary team including radiation oncologists, medical physicists, a medical dosimetrist and a radiation therapist. The American Association of Medical Dosimetrists (AAMD), American Association of Physicists in Medicine (AAPM), American Brachytherapy Society (ABS), American College of Radiology (ACR), and the American Society of Radiologic Technologists (ASRT) have endorsed the white paper.

Conclusion

Communication of the prescription involves all members of the treatment team and is critical to delivering safe and effective care to patients. A standard prescription will reduce errors and will facilitate safe and accurate treatment delivery, in accordance with the prescriber's intent. Share this white paper and Tip of the Month with all of your colleagues to promote adoption of the standard prescription.