Implementation and Impact of Standard Nomenclature for Field Name and Description

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Background

Treatment fields in radiotherapy have a short (5 character) name and longer (20 character) description and provide information on beam orientation, treatment site, and other key information. However, there are no accepted standards as to how these items should be written. If names and descriptions are created manually, this process is slow, error prone, and could result in patient treatment delays and/or fail to provide extra safety layers.

In 2019, about 3 events were reported per quarter related to beam labeling errors. While these events did not lead to harm, they caused distractions as team members worked to get clarification. These reports did not capture every time this occurred; however, they were a good indicator of a widespread problem that caused frustration and delays while corrections were made[1,2,3].

Aim

To develop an automatable standard nomenclature for field name and description to reduce field labeling errors.

Methods

A multi-disciplinary workgroup met to discuss which elements should be conveyed via the MosaiQ field name and description. Care was taken for situations where field name may be redundant with fields in current or previous treatments. Once the nomenclature was agreed upon, a TPS script was created to minimize manual entry, save time, and ensure compliance.

Table 1. Abbreviations used in the field name and/or description. X is required, * is required based on the treatment plan, and – is not used.

Abbreviation	Meaning	Name	Description
BH	breath-hold, field to be treated using breath-hold gating	-	*
BL	bolus, field to be treated with bolus in place	*	*
GGG	the 3-digit gantry angle (ex. 090, 315, 000, etc.)	-	X
CCC	the 3-digit couch angle (ex. 090, 270, 000, etc.)	-	X
α	Alpha, a sequential letter counter (i.e. A, B, C, etc.) that can expand to double (AA, BB, etc.) , and then triple letters (AAA, BBB, etc.) if needed. X,Y,Z reserved for imaging fields	X	*
#	a numeric counter (i.e. 1,2,3, etc.)	*	
Arc	identifies a VMAT field	-	*
3DCA	identifies a 3D conformal arc	-	*
Mod	modifier, a special modifier used as needed (e.g. Upper IMC, FIF, etc.)	-	*
SiteName	Site name inherited from the prescription site name and is a unique description of the treatment site.	-	X
IGRT	image guided radiation therapy, needed for billing of 2D/3D images	-	X
CBCT	identifies a cone-beam CT imaging field	-	*
CTOR	identifies a CT-on-rails imaging field	-	*

Table 2. Standard nomenclature for field name and description and examples.

Treatment Field Nomenclature		
Name: α#BL	Description: BH·BL·Arc·3DCA·CCC-GGG·α · Mod · SiteName	
2D Imaging Fields Nomenclature		
Name AP/PA: XGGGα	Description: GGG·IGRT·SiteName	
Name Lats: YGGGα		
Name Other: ZGGGα		
3D Imaging Fields Nomenclature		
Name: CBCT#	Description: CBCT#·IGRT·SiteName	
Name: CTOR#	Description: CTOR#·IGRT·SiteName	
Examples		
Name	Description	Meaning
E2BL	BHBL 351-327B FIF CW	Chestwall under breath hold with bolus; static field; couch at 351, gantry 327; plan has 2 fields with the same couch-gantry combination and is a field-in-field beam
Y090B	090 IGRT Lt Lung	Imaging field of left lung at gantry 90; patient has previous field ID as Y090
CBCT	CBCT IGRT Liver	Cone-Beam CT for liver

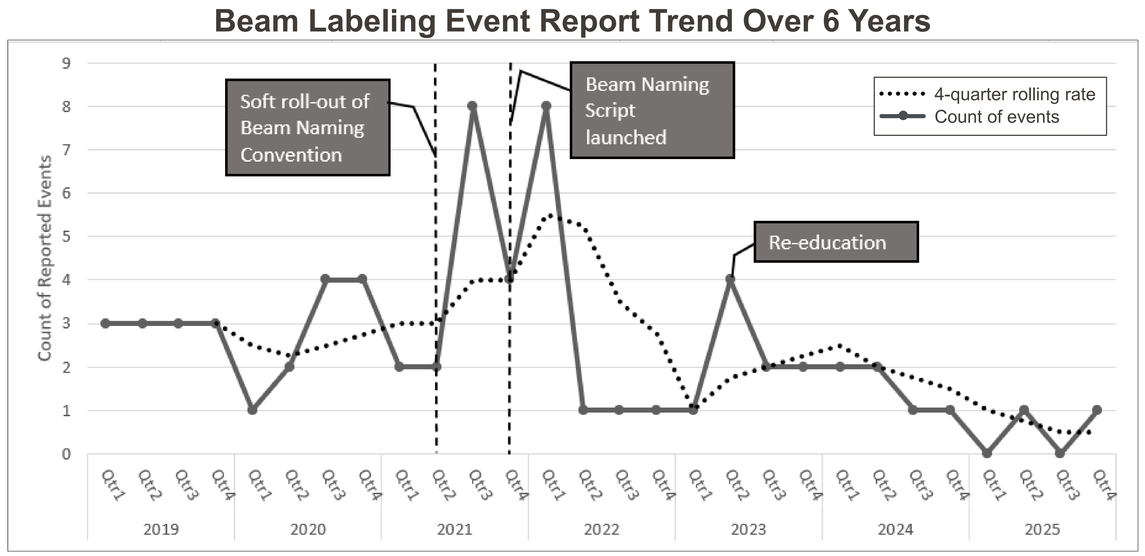

Figure 1. Beam labeling event reports were reported about 3 times per month in 2019; however, as the beam nomenclature was implemented along with script, the number of reports has been reduced to less than 1 per month in 2025. The rolling rate shows an 83% reduction over 6 years.

Results

To represent beam orientation, the workgroup decided to use couch-gantry (CCC-GGG) rather than anatomical labels. This change avoids confusion for non-head-first supine patients as well as calling attention to couch kicks. The site name was included to associate fields with a particular prescription which is important in the multi-iso and adaptive settings. Other elements included are breath hold (BH), bolus (BL), VMAT (Arc), and 3D conformal arc (3DCA) as these are key treatment elements that therapy wanted highlighted. Both a numerical counter and sequential letter counter were determined to be needed to ensure distinct field identities as well as underscores split fields. Table 1 shows the agreed upon abbreviations used for various key elements as well location: name and/or description. Table 2 shows the agreed upon standard nomenclature convention for treatment fields, imaging fields, and examples.

This standard nomenclature was implemented as a pilot with manual name creation in May 2021, while rules were being finalized, and an automated naming script was being developed. During the pilot phase, an increase in field labeling reports was observed as team members became acquainted with the new process that still required manual entry. In December 2021, the field naming script was released. The first quarter of 2022 saw another spike in field labeling safety reports as teams continued to get used to the new script and naming convention. The rolling 4-quarter average shows that as of Q4-2025 there is less than 1 event reported per quarter or an 83% reduction in reported beam labeling events since Q4-2019 (Figure 1).

Conclusions

A standard naming convention for field labels enabled clinical implementation of a field labeling script, which reduced manual entry and therefore safety reports related to field labeling errors.

References

1) Howell AM, Burns EM, Hull L, et al. International recommendations for national patient safety incident reporting systems: an expert Delphi consensus-building process. BMJ Qual Saf. 2017;26:150–163.
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3) Macrae C. The problem with incident reporting. *BMJ Qual Saf*. 2016;25:71–75.