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Quality Audit Plan- Circumferential Resection Margin

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The Surveillance, Epidemiology, and End Results (SEER) Program continuously monitors its processes and coding quality to achieve excellence in its operational environment. Data quality is important not only for the SEER program, but it is vital to all users interested in evaluating changes in cancer rates, patterns of cancer treatment and the effectiveness of public health effort to prevent cancer and improve patient survival. One data quality control method recently adopted by SEER, that we are discussing here, is known as Quality Audit Plan (QAP).

Quality Audit Plan

Quality Audit Plan (QAP) is a systematic way to evaluate the quality of existing and potential SEER data. It acts as a standardized framework for verifying and validating such data with respect to three important components: Completeness, Consistency and Precision/Accuracy. The QAP has the following purpose:

- Systematize currently on-going quality activities within SEER
- Develop methods to proactively address the changing data landscape required for cancer surveillance
- Provide a formal method to prioritize existing and future quality efforts
- Identify ways to improve data quality and provide better population-based information using a standardized method
- Provide more consistent communication to registries and data users with respect to quality efforts within SEER

Circumferential resection margin

Evaluating the accuracy of coding the circumferential resection margin for colon and rectal primaries was chosen as one of the QAPs based on input from Quality Improvement Experts (QIE) from each registry. The QIE team indicated both hospital and central registry staff struggle to code this data item accurately and consistently.

According to AJCC 7th Edition Cancer Staging Manual, "The CRM is the surgically dissected non-peritonealized surface of the specimen. It corresponds to any aspect of the colo-rectum that is not covered by a serosal layer of mesothelial cells and must be dissected from the retroperitoneum or sub-peritoneum in order to remove the viscus."

Table 1 indicates the current coding values for this data item. A positive CRM is <1mm distance between tumor and resected margin. This is the definition of CRM involvement used by surgeons. (Some studies found a value of ≤ 2 mm to be a more appropriate cutoff.) Coding would be less complicated if we could

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simply code 000 (Margin IS involved with tumor). However, for the purpose of coding this data item, we have to code to the exact distance when it is given even if it less than 1 mm.

When we were all coding Collaborative Stage (CS) Site Specific Factor#6 (SSF6), the CRM was the exact measurement/distance from the greatest extension of the tumor to the circumferential resection margin. Equivalent terms for CRM are "radial margin" and "mesenteric margin." Studies agree that a positive CRM is a prognostic factor for disease recurrence, distant metastasis, and overall-survival. Accurately coding this data item will help researchers provide clinicians the information to identify adjuvant and neoadjuvant treatment options and the surgical techniques that optimize patient survival.

Table 1 – Site Specific Factor 6 – Circumferential Resection Margin (CRM)

Code	Description
000	Margin IS involved with tumor Circumferential resection margin (CRM) positive Described as "less than 1 millimeter (mm)"
001-980	0.1- 98.0 millimeter (mm) (Exact size to nearest tenth of millimeter)
981	98.1 mm or greater
988	Not applicable: Information not collected for this case (May include cases converted from code 888 used in CSv1 for "Not applicable" or when the item was not collected. If this item is required to derive T, N, M, or any stage, use of code 988 may result in an error.)
990	No residual tumor identified on specimen
991	Margins clear, distance from tumor not stated CRM negative, NOS
992	Described as "less than 2 mm," or "greater than 1 mm," or "between 1 mm and 2 mm"
993	Described as "less than 3 mm," or "greater than 2 mm," or "between 2 mm and 3 mm"
994	Described as "less than 4 mm," or "greater than 3 mm," or "between 3 mm and 4 mm"
995	Described as "less than 5 mm," or "greater than 4 mm," or "between 4 mm and 5 mm"
996	Described as "greater than 5 mm"
998	No resection of primary site Surgical procedure did not remove enough tissue to measure the CRM (Examples include: polypectomy only, excision of tumor only or excisional biopsy only)
999	Unknown or no information CRM not mentioned Not documented in patient record

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The quality audit was conducted for diagnosis years 2010-2015 with the following goals:

- Evaluate the completeness of CRM data collection by year and registry, and make recommendations for completeness improvement
- Identify and correct logic inconsistencies between CRM and related items, such as surgery of primary site, diagnostic confirmation, etc.
- Assess the likelihood of CRM miscoding/misclassification for cases that received a measurement greater or equal to 0.1mm
- Estimate benchmarks for completeness and distribution of CRM

The primary errors observed included:

- Coding a surgical margin other than CRM
- Incorrectly converting centimeters to millimeters to document the distance between the leading edge of the tumor and the nearest edge of surgically dissected margin
- Recording CRM to 000 when no surgery was done or a surgery was done that could not assess the CRM

Let's review the most commonly noted discrepancy patterns found during the audit and also a few suggested solutions to improve coding for this data item.

Issue 1: Resection not performed per surgical code, but CRM not coded to 998
When no resection of primary site is performed or the type of surgical procedure performed never removes enough tissue to measure CRM (e.g., polypectomy only, excision of tumor only or excisional biopsy only), then SSF 6 (CRM) should be coded as 998, and surgery codes should range from 00-29. (See Table 2.)

Table 2 –Site Specific Surgery Code and Ability to Assess CRM

Surgical Code (Colon)	Description
00-29	No surgical resection or the type of surgical resection performed cannot assess CRM
30-80	Surgical resection in which CRM can be evaluated
90	Surgery, NOS may or may not be able to assess the CRM depending on the documentation available.
99	Unknown if surgery performed; death certificate only

Suggested solution for standard setters: In reviewing the data from 2010 to 2015, error rates across the entire SEER Program dropped from a high of approximately 23% in 2010 to about 12% in 2015. To correct all the current errors in each registry database, a batch update can be done for all cases with Surgery code <30 to update CRM to 998. An edit could be created to avoid future errors from occurring.

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Issue 2: Verify centimeter (cm) descriptions of CRM are correctly converted to millimeters (mm) and value code accurately reflects the placement of an implied decimal point
The CRM's distance between the leading edge of the tumor and the nearest edge of surgically dissected margin as noted in the pathology report is recorded to the nearest tenth in millimeters (mm). For example, if the CRM is 2 mm, code 020. (See Table 1.)

When the pathology report indicates the CRM in centimeters, the value needs to be converted to millimeters (mm) before recording the value. If the margin is described as less than 1 mm with no more specific measurement, use code 000 (CRM positive).

Another important reminder is to code negative CRM as 991 and not 000, which is the negative value for many other fields. Coding CRM to 000 (CRM positive) when documentation describes the CRM as negative may result when we assume and don't check the definition for code 000. The correct code for a negative CRM is 991. (See Table 1.)

Suggested solution for standard setters: Collect the CRM in centimeters rather than in millimeters to avoid the majority of measurement conversion errors because this is how this measurement is most commonly reported on the pathology reports.

Consider changing the code definition for a negative margin to 000. Many of us are probably guilty of trying to code from memory in the interest of speed. The problem occurs when we don't recall codes accurately, especially all the exceptions to the general rule!

Issue 3: Surgery code (30-80) indicates resection but CRM code indicates no resection 998
For surgery codes 30-80, when a resection is performed, CRM code should not be coded 998. (See Table 1.) Codes 001-980 record exact measurements of the CRM in mm. Codes 992-996 are used for margin descriptions lacking specific mm measurements. Code 999 (CRM not mentioned) is used if the pathology report describes only distal and proximal margins, or margins, NOS.

Suggested solution for standard setters: A batch update can be performed to update CRM to 999 (CRM not mentioned) if surgery is coded to 30-80. While the 999 code is nonspecific, it is the correct code if the CRM is not mentioned in the pathology report. Code 998 (No resection of primary site) is always incorrect for the CRM field when surgery to the primary site is performed. An edit can also be created to prevent future errors from occurring.

Issue 4: Not necessarily a coding error; but review to determine whether the CRM was actually reflected in the pathology report (Surgery = 30-80 and CRM = 999)
Only specific statements about the CRM should be coded. Documentation of only distal, proximal or margins NOS should be ignored in this data field. A negative margin without a statement including CRM should be coded to 999. As noted above, descriptions of radial or mesenteric margins are equivalent to a CRM, and are occasionally missed. Moreover, sometimes in the gross description the distance of the tumor to the radial margin is mentioned. Per CA-Forum, gross description can be used to code CRM if not available elsewhere.

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Suggested solution for us: If CRM is not mentioned, we need to check for equivalent terms that can be used to code this data item. We need to also check the gross description in the pathology report for a possible value of CRM.

Issue 5: Surgery, NOS (code 90) but with CRM code indicates resection
When surgery code is non-specific (Surgery, NOS) and there is no information available regarding margins, the CRM should be coded 999.

Suggested solution for standard setters: Inconsistencies between surgery codes with respect to CRM can be resolved by merging surgery codes 80 and 90 together (resection NOS and surgery NOS).

Going forward

Until the standard setters are willing to make the suggested changes, we need to be aware of and careful to avoid the common errors seen in the data or we will continue to observe the same error patterns in the new SSDI fields that were initially identified in a Collaborative Stage SSF field.

The intent of the SEER QAP is to continually analyze the data in order to:

- Identify issues that are specifically problematic to one or more registries
- Document findings
- Learn why erroneous data was collected in a certain way
- Create educational material to train us how to improve the quality of the data

It can be more than a little challenging to understand the purpose of every field and the definition of each code value in order to verify coding accuracy and identify error patterns leading to miscodes. Audits involving a large number of cases are valuable to confirm data quality and to identify potential coding issues that could impact research study results. The easier errors to fix are those that can be resolved without a medical record review by applying an electronic global correction to the dataset. Of course, the more time consuming to resolve are those requiring a medical record review. We want to try to avoid making those types of errors!

I've found that when I understand the importance of a data item and the impact data analysis has on patient care, my coding of the field improves. In an article by lead author Qi Liu titled, **"Circumferential Resection Margin as a Prognostic Factor After Rectal Cancer Surgery: A Large Population–Based Retrospective Study"** a circumferential resection margin ≤1 mm was independently associated with a 99% increased risk of cancer–specific mortality in rectal cancer. According to study results, surgeons should try to maximize the CRM because the researchers observed patients with greater CRMs had improved survival rates. Given the association between CRM and patient survival, it is important to review and monitor the quality of this data item to accurately inform surgeons how surgical techniques impact patient survival and whether it is important to consider neoadjuvant and/or adjuvant treatment options to extend the life of the patient.

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