Perioperative Hemorrhage or Hematoma (AHRQ Patient Safety Indicator 9)

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Although patient safety indicator (PSI)-9, perioperative hemorrhage or hematoma, is not heavily weighted within PSI-90—accounting for 4% of the total PSI-90—it is one of the most frequently reported PSIs. PSI-90 is a component of the Leapfrog Hospital Safety Grade. PSI-9 is also used in the CareChex hospital quality measure. Because of its relatively high prevalence, unless this condition is accurately reported, the number of PSI-9 quality numerator events (QNE) relating to perioperative bleeding could quickly add up to an unfavorable public reporting profile. The overall incidence of a PSI-9 event is approximately 4 per 1000 inpatient hospital admissions [1, 2]. PSI-9 represents hematoma in about 70% and hemorrhage in 30%; it is associated with a 7% mortality rate [2]. Interestingly, Mull and colleagues, reporting on Veterans Administration hospital data, also identified nearly an equal rate of these bleeding complications after hospital discharge [1]. Vascular surgery patients have a relatively high incidence of PSI-9 [3]. In this patient population, the occurrence of PSI-9 is associated with a threefold increase in mortality and a doubling of the cost of hospitalization [4]. The ability of PSI-9 to predict an actual postsurgical hematoma or major bleeding event is limited, with a positive predictive value (PPV) of 75% [2]. Reasons for falsely positive reported PSI-9 events included events present on admission (POA), hemorrhage or hematoma controlled during the original surgery, and postoperative bleeding that did not require a procedure. The PPV of PSI-9 may have improved with the adoption of POA codes.

PSI-9 is very well defined in the relevant Agency for Healthcare Research and Quality (AHRQ) document, Patient Safety Indicators Technical Specifications [5].

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It requires a surgical diagnosis-related group (as defined in AHRQ Appendix E), a specific code for the hematoma or hemorrhage (AHRQ code list POHMRI2), and a code for a procedure employed to treat it (AHRQ code list HEMOTH2P; (Methodology | Agency for Healthcare Research and Quality (ahrq.gov)). The latter codes describe a large list of procedures with the descriptors of drainage, destruction, extirpation, occlusion, repair, or revision. When a hemorrhage or hematoma occurs intraoperatively, there is opportunity for miscoding and overreporting bias. Note that in this context, the interventions of blood transfusion or fluid resuscitation are not considered a procedure to treat hemorrhage or hematoma.

Exclusionary conditions are also fairly well defined. They include the hematoma or bleeding being POA or occurring prior to the surgical procedure, as well as cases where treatment of the bleeding or hematoma was the only surgical procedure. Presence of coagulopathy represents another exclusionary condition often overlooked. It is defined by a set of AHRQ exclusionary codes (COAGDID).

Key Concept
This important PSI is very well defined and many opportunities exist to improve the accuracy of reporting. The most important are to establish whether the bleeding was clinically significant and was inherent in the procedure, and whether an exclusionary condition exists.

16.1 Approach to Review

Because PSI-9 is so well defined, a review process can be established that can easily be followed by performance improvement coordinators or other similarly trained clinical personnel. Table 16.1 describes the standard operating procedure used by our teams to identify the QNE, while the patient is still hospitalized, using surveillance software (3M), and complete the review in the EPIC medical record, using the coder's view. This procedure can also be used for other QNEs identified in the surveillance software (see Chap. 7).

Case Illustration: PSI Avoidance Through Accurate Documentation of POA Due to Initial Outpatient Status
Reason for Concurrent Chart Review: This patient's chart was reviewed for PSI-9, identified by 3M (Perioperative Hemorrhage or Hematoma Rate). The trigger for PSI-9 was post-procedural hemorrhage of a genitourinary system organ (N99820) following a genitourinary procedure, not present on admission.

Review Summary: This patient was placed in observation status prior to having an elective myomectomy operation. The procedure was completed at 10:06 AM. Total estimated blood loss was 500 mL. The physician's order to

admit to outpatient extended recovery was placed at 10:59 AM. In the afternoon of the same day, the patient became tachycardic but was otherwise stable with only mild abdominal pain. A small amount of bloody drainage was present on the dressing. A blood test showed a hemoglobin level of 6.9 g/dl. An hour later, the patient was noted to be pale and sleepy but fully oriented. Shortness of breath increased and blood was administered along with albumin. Blood pressure was 86/52 mmHg and the heart rate had increased to 145/min. At 2:00 PM, concern for abdominal bleeding led to return to OR after establishment of continuous arterial blood pressure monitoring. The hemoglobin concentration was now 6 g/dl. The operative note documented the presence of 1500 mL intra-abdominal blood. The uterus was intact with no evidence of bleeding. A small bleeding perforating vessel in the broad ligament was identified. The takeback procedure was started at 14:21 PM and was completed at 15:39 PM. The inpatient admission order was timed at 15:48 PM.

Proposed Coding (Pre-billing): The diagnoses of post-procedural hemorrhage of a genitourinary system organ (N99820), post-procedural hypotension (I9581), acute post-hemorrhagic anemia (D62), hemoperitoneum (K661), and other shocks (R578) were all proposed to be coded as not POA.

Quality Review Reasoning and Request: Documentation indicated that post-procedural hemorrhage, post-procedural hypotension, acute post-hemorrhagic anemia, hemoperitoneum, and shock all happened prior to inpatient admission. The request was to change to POA of yes.

Referral for Senior Physician Review: The quality reviewer referred this case for senior physician review because the bleeding episode did not occur during the present hospital inpatient admission. Senior physician review was confirmatory.

Coding Outcome: The account was reviewed by a senior coder at the request of the quality department. The determination was that coding changes were needed to change the status of the above diagnoses to POA = yes.

Table 16.1 Standard operating procedure for concurrent clinical review for perioperative hemorrhage/hematoma in an epic electronic medical record environment and 3M software

Review Step	Procedure
Prework	When a PSI-9 case appears in the facility-specific Epic work queue list (work queues – Pre-bill complication review in Epic dropdown menu): Copy the HAR # from the EPIC "Acct" field Enter HAR # into 3M Enter the chart in 3M Click on Indicator tab, then click on Final Code Summary in 3M Look for AHRQ Quality Indicators (The PSIs or HACs will appear in blue) in 3M Enter Epic (in coders' view, using HAR#) to review the case with focus on the quality indicator(s)

(continued)

Table 16.1 (continued)

Review Step	Procedure
Chart Review (in Epic coders' view) *to Establish POA Status*	1. Go to "Coding" tab, then select the "ADT Info" section. 2. Determine if there is a significant difference between admission and inpatient admission date and time. The reason is that a hematoma/hemorrhage may be POA because the procedure was done in outpatient status and the patient was converted to inpatient status after the hematoma/hemorrhage occurred. 3. In the "Doc(ument) Review" section, clinical indicators for POA evidence may be found under "History & Physical" and "ED Summary," as well as "Discharge."
Chart Review (in Epic coders' view) *to Establish Clinical Significance*	Look for indicators of clinical insignificance (e.g., small hematoma, no need for transfusion, no need for surgical intervention, no evidence of monitoring interventions beyond routine postoperative surveillance). In other words, it is important to establish if any of the MEAT (monitoring, evaluation, assessment, and treatment) criteria were met.
Chart Review (in Epic coders' view) *to Establish Exclusionary Diagnoses*	For PSI-9, exclusionary diagnoses are listed below. Look for clinical indicators of low platelet count (labs section), anticoagulant use, elevated PT/PTT/INR, clinical mention of coagulopathic state, diffuse oozing, etc. Look in operative note, procedure note, or progress notes. Hemorrhagic disorder due to extrinsic circulating anticoagulants Drug-induced pancytopenia Acquired coagulation factor deficiency Pancytopenia Coagulation defect, unspecified Qualitative platelet defects (such as seen in ESRD) Disseminated intravascular coagulation Thrombocytopenia, unspecified (but not secondary thrombocytopenia) Hemorrhagic condition, unspecified

ESRD end stage renal disease, *HAC* hospital acquired condition, *PSI* patient safety indicator, *HAR* health account record, *PT* prothrombin time, *PTT* partial thromboplastin time, *INR* international normalized ratio, *ED* emergency department

Physician reviewers need to look for examples of overt or implicit documentation in surgeons' operative reports and postoperative notes that link the bleeding event to coagulopathic conditions. Coagulopathic states need not always be supported by laboratory testing but can be based on clinical impressions, using terms such as "diffuse oozing." When present, laboratory tests can provide clinical indicators of coagulopathy, such as a low platelet count or an elevated INR or PTT. Even in the absence of laboratory evidence, the use of heparin infusions, thrombolytics, and other anticoagulants near the time of the surgical intervention can serve as clinical indicators for query generation. The object of such a query would be to clarify whether the bleeding event should be more appropriately linked to the effect of such medications as opposed to representing a surgical complication. One goal of medical staff education should be to increase awareness of the reason for queries attempting to link bleeding to anticoagulant administration or other conditions likely to case bleeding.

16.2 Medical Staff Education

Physician education should emphasize that not every postoperative bleeding episode or hematoma will result in a PSI-9 event. Physicians should document when, in their judgment, bleeding is related to coagulopathy, whether it is intrinsic to the patient's state of health or if it is due to administration or prolonged effect of anticoagulant medications. This diagnostic linkage should also be kept in mind when answering medical record queries. All too often, the easiest and quickest response is simply to agree with the first choice given in the query format (i.e., to confirm the bleeding as a surgical complication) or to check a choice that may read "clinically undetermined" or similar. In answering such queries, surgeons and their medical staff team members should be advised to read queries carefully. They should also be educated about the potential impacts of inaccurately or hastily answered queries. In the following paragraphs, we discuss examples of topic areas for concurrent review and resulting opportunities for timely feedback and education to the medical staff.

Medical staff education should also address documentation needs for occurrence of seroma and the significance of queries relating to this diagnosis. If the patient experienced a condition that more likely represented a seroma, medical staff should seek to represent this diagnosis should accurately. For example, if the medical record indicates fluid collection or swelling along the wound edges without a definitive description of bleeding or hematoma, a query may be needed to clarify the condition because diagnostic codes for seroma, such as "postprocedure seroma of the skin and subcutaneous tissue" (L7634), do not trigger a PSI-9. Medical staff should understand the need to answer such queries with the highest degree of specificity, as the response may be the difference between an unwarranted PSI-9 event being reported or avoided.

Medical staff should also be aware of the situation where a radiology report or the results of a radiology report copied into a provider note might present evidence of a postoperative hematoma, resulting in a special dilemma. For example, on a postoperative computed tomography scan of the abdomen, a fluid collection is identified but cannot be fully characterized. The report may state that the collection could represent either ascites, an abscess or a hematoma. Depending on the full clinical picture, one may be more likely than the other. If the collection is ultimately drained, its character (i.e., fluid, infection, or blood) would be proven. However, it is conceivable that before this happens, a medical record query is sent, with providers unwittingly confirming the query choice of a postoperative hematoma. Provider education should identify such situations, and clinical documentation partners may need to issue a query to clarify the situation, choosing the appropriate time so that providers are not pushed to make diagnostic determinations too early during the hospital course. Provider education should emphasize the importance of documenting the overall clinical picture to indicate whether the bleeding was clinically significant as defined by the presence of MEAT. Collecting case examples with these considerations can enrich the specificity and relevance of physician education efforts.

References

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