Surgical wound classification is information that most circulating nurses document on a patient’s record at the end of a surgical procedure. Nurses must understand the different classifications and the process of assigning categories to ensure that wound classification is accurate.

In 1964, the National Academy of Sciences National Research Council published its landmark study on the use of ultraviolet lights in the OR, and the era of classifying wounds by the contamination present (or the potential for contamination) began. Classifying wounds became one method of predicting a surgical patient’s risk of an infection based on an assessment of the degree of bacterial load (ie, contamination of a surgical wound) observed at the time of surgery. The American College of Surgeons defined the initial wound classification categories, and the Centers for Disease Control and Prevention adapted these categories into the current guidelines that were issued in 1985. Using this traditional system to define wound classification, surgical procedures are placed into one of four categories:

- clean (class I),
- clean/contaminated (class II),
- contaminated (class III), and
- dirty/infected (class IV).

Several factors affect the potential for surgical site infection development and contribute to the assignment of wound classification. These factors include, but are not limited to,

- the location of the surgery,
- the presence of acute inflammation,
- a major break in sterile technique, and
- the presence of existing infection at the surgical site.

In many outcome studies, wound classification is an important data point collected as a predictor of postoperative infection and its associated risks. Wound classification plays an important role in identifying risk-adjusted outcomes that drive quality improvement initiatives. In addition, wound classification and risk-adjusted outcomes are increasingly used for reporting and analyzing clinical care. Risk-adjustment analysis allows for more consistent evaluation of the outcomes delivered by health care providers, and documentation...
must be accurate for the analyses to be effective. Incorrect capturing of the data point for wound classification can skew results and potentially reflect invalid outcomes.

WOUND CLASSIFICATION

Wound classification should be determined and documented at the end of the surgical procedure to accurately reflect and capture any events that may have occurred during the procedure that would affect wound classification. Examples of this include the following:

- A surgeon is about to close the fascia during an exploratory laparotomy when a surgical team member notices a tear in the back table drape. In this instance, a major break in sterile technique has occurred and the circulating nurse would need to change the initial wound classification of clean/class I to contaminated/class III.

- A surgeon is about to remove the patient’s gallbladder during an uneventful laparoscopic cholecystectomy when the gallbladder tears and bile stones spill into the abdomen. In this example, the circulating nurse would change the initial wound classification of clean/contaminated/class II to contaminated/class III because of the gross bile spillage.

An understanding of what constitutes a wound class is important for the perioperative nurse to accurately assess and document wound classification. Decision algorithms can help in making these determinations (Figure 1).

Clean/Class I Wounds

A clean or class I surgical wound is one that does not enter the respiratory, gastrointestinal (GI), genital, or urinary tract. These wounds are uninfected, and no inflammation is present. Clean wounds are closed primarily (ie, sutured or approximated in some other way), and if a drain is present, it drains into a closed system. The risk of developing an infection from a clean wound is approximately 2%. Infections that do occur in clean wounds are largely a result of gram-positive organisms such as Staphylococcus aureus. Examples of a clean wound include incisions made for hernia repair, exploratory laparotomy, mastectomy, or vascular bypass graft harvest.

Clean/Contaminated/Class II Wounds

A clean/contaminated or class II surgical wound is one that enters the respiratory, GI, genital, or urinary tract in a controlled manner (ie, intentionally). These wounds are uninfected, and no acute inflammation is present. The risk of developing an infection from a clean/contaminated wound is approximately 5% to 15% and is largely a result of endogenous flora and bacteria from within the patient. Examples of procedures classified as clean/contaminated include hysterectomy, colectomy, lung lobectomy, or cholecystectomy for stones or chronic inflammation.

Contaminated/Class III Wounds

An open, fresh (ie, less than four hours old), accidental wound is classified as contaminated. Surgical procedures that result in contaminated wounds include those with acute, nonpurulent inflammation; a major break in sterile technique; or gross spillage from the GI tract. An active infection is not present in a contaminated wound. The risk of
Did you encounter:
- Purulence/existing clinical infection?
- Perforated viscera?
- Open traumatic wounds > 4 hours?
- Retained devitalized tissue?
- Penetrating injuries > 4 hours?

No

Did you encounter:
- Acute, nonpurulent inflammation?
- Gross (ANY) spillage from the GI tract (bile)?
- Infarcted or necrotic bowel?
- Other necrotic tissue?
- Major break in sterile technique?

No

Did you encounter:
- The respiratory, gastrointestinal or genitourinary tracts?

Yes

Class IV
Dirty/Infected

No

Class I
Clean

Yes

Class III
Contaminated

Class II
Clean/Contaminated

NOTE:
- Chronic inflammation only does not change the classification.
- Gross spillage is any spillage you can see with the naked eye.

Figure 1. Wound class algorithm. Reprinted with permission from Cone Health, Greensboro, NC.

developing an infection from a contaminated wound, however, is greater than 15%, largely because of endogenous leakage or delayed exogenous contamination introduced into the surgical wound during the procedure. Examples of procedures that result in a contaminated wound include appendectomy for acute appendicitis, open cardiac massage, or cholecystectomy with acute inflammation and bile spillage.

Dirty/Infected/Class IV Wounds
An old (ie, more than four hours old), traumatic wound containing retained devitalized tissue is considered dirty or infected. This classification includes wounds that involve an area with an existing clinical infection or perforated viscera and suggest the infection was present in the surgical field before the incision was made. The risk of developing an infection from a contaminated
wound is greater than 30% and is largely the result of existing infection from unusual or pathogenic organisms. Examples of procedures in which the wound is contaminated include appendectomy for a ruptured appendix, appendectomy with the presence of pus, surgical treatment of an abscess, the irrigation and debridement of a perirectal abscess, or the repair of a perforated bowel or perforated gastric ulcer. An infectious process that is present but not near the surgical site does not affect wound classification.

THE ROLE OF THE PERIOPERATIVE NURSE
Perioperative nurses play a pivotal role in actively communicating and collaborating with health care team members to ensure the accuracy of the clinical data they are documenting. In fact, communication is a key component for patient safety in any arena in the continuum of patient care. Lack of communication between team members is commonly cited as the cause of adverse patient events, and many patient safety and quality improvement initiatives focus on improving team communication methods. Building a culture of communication is rooted in and results in good teamwork. Good teamwork behaviors lead to positive patient outcomes when all staff members are encouraged to speak up about any patient safety concern. Some of these tools include checklists or briefing and debriefing tools. These tools empower surgical team members to identify and resolve patient safety issues that may cause harm if not addressed. Using these tools provides a framework to cultivate teamwork and communication with the ultimate goal of improving performance and safety for the patient.

Adding wound classification to an existing checklist or debriefing tool is an effective way to enhance the communication of the entire surgical team regarding the assignment of wound classification and assessment of the surgical field. Wound classification requires an active conversation between the surgeon, the perioperative nurse, and the other team members and should not be made by independent nursing assignment of classification. Without this communication, the circulating nurse may be unaware of changes in the procedure that would alter the classification and could affect the patient’s outcome. Other interventions that can immediately be practiced to positively affect wound classification include:

- using a standardized system for wound classification,
- maintaining sterile technique and identifying when a break occurs, and
- accurately documenting all elements in the surgical record.

CONCLUSION
Wound classification is an important clinical activity that nurses must routinely document in the patient’s surgical record. Accurate documentation of wound classification is essential for preventing and tracking surgical infections and ensuring positive surgical outcomes for patients. Perioperative nurses play a key role in documenting this important data point, and it is imperative that they understand the definition and significance of wound classification assignment. For the patient’s sake, nurses also must continue to actively communicate with the entire surgical team to ensure that wound classifications are accurate.

References
6. Zinn J, Swofford V. What is wound classification? Speech presented at: The 58th Annual AORN Congress; March 18, 2010; Denver, CO.
9. Burlingame B. OR fire extinguishers; classifying wounds and minor procedure; antibiotic infusion time; mopping after minor procedures [Clinical Issues]. AORN J. 2006;83(6):1384-1393.

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