

CH CLINICAL ISSUES

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Key words: *nickel allergy, tourniquet cuff, manufacturer's instructions for use (MIFU), pressure injury, communication.*



PODCAST

NICKEL ALLERGY CONSIDERATIONS

Question:

What intraoperative considerations should the perioperative team address for a patient with a nickel allergy, particularly when implanted metal devices will be used?

Answer:

To promote safe care, perioperative teams can interview the patient to verify the nickel allergy, communicate the allergy to the surgical team, evaluate whether planned implants contain nickel, and collaborate with the team to consider alternative materials when appropriate. Nickel hypersensitivity is relatively common and most often presents as a delayed (type IV) hypersensitivity reaction.¹⁻⁶ Allergic contact dermatitis is the most frequent manifestation, and not all patients with cutaneous nickel

sensitivity develop systemic reactions.¹ Systemic nickel allergy syndrome is less common and involves both cutaneous and extracutaneous symptoms after internal exposure to nickel in previously sensitized individuals.² In rare cases, systemic hypersensitivity responses to nickel exposure have been associated with Kounis syndrome—an allergic acute coronary syndrome in which inflammatory mediators may trigger coronary vasospasm or thrombosis.^{2,3}

Many implantable devices used in the perioperative setting contain nickel or nickel alloys, including stainless steel (Sidebar 1). Vascular devices (eg, intracranial stents, coronary stents) are commonly composed of nickel alloys (eg, cobalt-chromium, nitinol). Additional devices that can contain nickel include orthopedic implants¹ (eg, joint prostheses, plates, screws) and ligating clips used for cholecystectomy.⁵ Unlike transient contact, implanted devices

Sidebar 1. Types of Implants That May Contain Nickel*

- Stents and endovascular devices^{1,2}
- Bone fixation devices (eg, plates, screws, rods, k-wires, sternal wires)^{3,4}
- Joint prostheses (eg, hip, knee, shoulder)³⁻⁵
- Ligating clips (eg, cholecystectomy)⁶

*There is no single comprehensive list of nickel-containing implants; however, nickel is commonly present in several categories of medical devices due to its role in metal alloys (eg, stainless steel, cobalt-chromium, nitinol).¹⁻⁴

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remain in the body and may release nickel ions over time as they corrode from contact with biological fluids and wear, especially at junctions.^{1,3,6}

Awareness of both implant-related and environmental sources supports comprehensive intraoperative planning, particularly when selecting implantable materials for patients with a known hypersensitivity to nickel. In contrast, surgical instruments made of stainless-steel alloys containing nickel generally pose less risk because of the patient's limited exposure and the lower likelihood of clinically significant nickel release.

Although metal hypersensitivity has been associated with complications, such as localized soft tissue reactions and delayed wound healing, the relationship between nickel allergy and adverse outcomes remains inconsistent across the literature.^{1,3,4,6} Authors of an evidence summary on coronary artery stenting found that evidence associated with restenosis is lacking and recommended that nickel hypersensitivity should not be a factor in deciding which stent to choose for a patient.⁷ For neurovascular stenting, researchers reported that although nickel-containing stents can be associated with inflammatory responses and complications, such as in-stent stenosis or neurologic events, current evidence does not show a consistent or conclusive association between preexisting metal allergy and adverse outcomes.⁴ Similarly, orthopedic literature emphasizes that hypersensitivity-related implant failure is a diagnosis of exclusion that can mimic infection or mechanical complications.^{1,6}

The presence of a nickel allergy alone should not prompt selection of a suboptimal device or deviation from evidence-based practice. The perioperative team should balance the risk of hypersensitivity against the known performance and safety of the device, recognizing that many patients with self-reported nickel sensitivity may not experience clinically significant reactions. The role of the perioperative RN is to verify that the nickel allergy is documented and clearly communicated, and to collaborate with the surgeon and interdisciplinary team to evaluate device composition and consider alternatives (eg, titanium-based implants, non-metal sternal closure systems) when appropriate.⁸ Because hypersensitivity reactions can mimic infection or other postoperative complications (eg, pain, swelling, recurrent wound drainage, delayed wound healing, implant loosening or instability), vigilant assessment, interdisciplinary communication, and postoperative monitoring are essential when metal implants are used in sensitized patients.^{1,3,5,6}

CLEANING AND DISINFECTING TOURNIQUET CUFFS

Question:

The manufacturer's instructions for use (MIFU) for a reusable pneumatic tourniquet cuff used in the OR state to clean with a "mild detergent" but do not clearly define the product or provide disinfection guidance. How should the tourniquet be cleaned and disinfected?

Answer:

The AORN "Guideline for pneumatic tourniquet safety"⁹ emphasizes that reusable cuffs can harbor microorganisms and should be cleaned and disinfected with a facility-approved disinfectant after each use in accordance with the MIFU. Low-level disinfection is recommended because the reusable pneumatic tourniquet cuff is a shared patient care device that generally comes into contact with intact skin and has the potential for contamination during repeated use between surgical patients. Unclear MIFU (eg, undefined terminology, such as "mild detergent") or missing disinfection guidance create gaps that may lead to inconsistent cleaning practices and increased cross-contamination risk in the perioperative environment.

Perioperative leaders and infection prevention personnel should contact the manufacturer to clarify the definition of "mild detergent," request documentation (eg, validation studies), and determine whether an Environmental Protection Agency-registered disinfectant is compatible with the tourniquet cuff materials.¹⁰ Documentation of all manufacturer communication should be retained. In addition, the perioperative team should evaluate whether the MIFU aligns with infection prevention principles and regulatory expectations that support cleaning and disinfection of shared reusable equipment.¹⁰ If the manufacturer cannot provide clear or feasible guidance, an interdisciplinary team (eg, perioperative nursing, infection prevention, biomedical engineering, risk management) should review the issue and determine whether an alternative process is needed to support safe reprocessing in the OR setting.¹⁰

When manufacturer guidance is insufficient, the team may need to implement an alternative recommendation based on evidence and infection prevention principles, such as using a facility-approved disinfectant after cleaning. Because these alternatives may not be manufacturer validated, the

team should conduct a risk assessment to evaluate the likelihood of contamination, potential patient harm, and workflow feasibility during turnover.¹⁰ Risk mitigation strategies may include standardizing the cleaning and disinfection process, providing staff education, and auditing compliance. If concerns remain unresolved, escalation to regulatory agencies or reconsideration of device use may be necessary to ensure safe and consistent perioperative practice.

PREVENTING HEEL PRESSURE INJURY DURING CORONARY ARTERY BYPASS GRAFT PROCEDURES

Question:

How can perioperative team members prevent pressure injuries to the heels during coronary artery bypass graft procedures when both lower extremities are prepped into the sterile field, while also maintaining surgical access for obtaining a saphenous vein?

Answer:

When both lower extremities are included in the sterile field, leaving the heels resting on the OR bed surface increases the risk of pressure injury; therefore, preventive strategies should be implemented while maintaining sterility and surgical access.¹¹ Patients undergoing coronary artery bypass graft procedures are at high risk for perioperative pressure injuries because of prolonged operative time; immobility under anesthesia; and physiologic factors, such as hypoperfusion and use of cardiopulmonary bypass.¹¹ Sustained pressure during procedures performed in the supine position contributes to tissue deformation and ischemia, and the risk of pressure injury increases with longer operative duration; patients undergoing cardiac surgery have been shown to have higher risk compared with other surgical populations.¹¹ The heels are particularly vulnerable because of their minimal soft tissue coverage and susceptibility to pressure, shear, and impaired perfusion.¹²

Prophylactic dressings may be applied to bony prominences as an adjunct to positioning interventions in patients at increased risk.^{11,12} The prophylactic dressings decrease pressure, shear, and friction forces and have shown greater efficacy than transparent film dressings in reducing the incidence of heel pressure injuries during surgical procedures.¹³ The use of prophylactic dressings does not replace the need for pressure redistribution, and dressing materials

should be selected and applied according to the MIFU.¹¹ Sterile prophylactic materials (eg, multilayer silicone foam dressings) can be applied to the heels after skin antisepsis and draping without contaminating the sterile field.

Heel offloading by suspending the heel and distributing the weight of the leg along the calf should be implemented to redistribute pressure.¹¹ This may be achieved by placing a pressure-redistributing positioning device under the calves before draping or by using a sterile positioning device on the sterile field. Effective offloading elevates the heel completely off the OR bed surface without placing pressure on the Achilles tendon and reduces the risk for deep tissue injury.¹¹ Selection of the offloading method can be based on the ability to maintain the sterile field and avoid interference with surgical access.

When the procedure involves obtaining a saphenous vein, perioperative team members can coordinate positioning activities with the surgeon before draping to ensure that pressure injury prevention interventions do not impede access to the operative extremity. Devices to offload pressure that have been placed on the sterile field may need to be temporarily adjusted or removed to facilitate obtaining the saphenous vein and then reapplied as soon as feasible. Ongoing assessment is necessary because intraoperative manipulation of the extremities or changes in positioning may alter pressure distribution and increase risk. An individualized approach that incorporates prophylactic dressings, appropriate heel offloading, and coordination with the surgical plan is required to balance the risk of heel pressure injury with the need to maintain sterility and procedural efficiency.

COMMUNICATING WITH A FAMILY MEMBER WHO IS A NURSE

Question:

How should perioperative nurses communicate with the patient when their family member is a nurse?

Answer:

The perioperative nurse's primary obligation remains to the patient, including the responsibility to provide clear, accurate, and understandable information that supports autonomy and informed decision-making.¹⁴ Altering

communication practices based on assumptions about a family member's clinical background, such as using jargon or redirecting communication, may undermine patient-centered care and conflict with ethical responsibilities to prioritize the patient. Situations in which a patient's family member is a nurse or other health care professional present a complex interplay of communication, ethical obligations, and professional boundaries that are frequently encountered in perioperative practice, but not always explicitly addressed. These scenarios introduce challenges associated with role expectations, confidentiality, and communication.

When family members are nurses, assumptions about their knowledge can create a risk to patient safety, particularly when perioperative personnel rely on the family member to interpret or reinforce discharge instructions. Patients often have difficulty comprehending and recalling critical information about medications, self-management, and warning signs that require follow-up care.¹⁵ Evidence shows that patient education during the discharge process is frequently incomplete, and essential elements, such as medication purpose and "red-flag" symptoms, are inconsistently addressed.¹⁵ Structured communication strategies, such as teach-back, have been shown to improve patient understanding, information retention, and self-care behaviors.¹⁶ Deferring education to a family member, regardless of professional background, may result in incomplete, inaccurate, or poorly translated information.

The presence of a family member who is a nurse may also introduce role ambiguity, heightened expectations, and interpersonal dynamics that affect communication. Perioperative nurses may feel pressure to modify their communication style, including providing less detailed explanations or, conversely, withholding information due to concern that the family member may challenge or correct them. This dynamic reflects a broader ethical issue; the family member may simultaneously function as a knowledgeable advocate and an emotionally involved support person without being a member of the formal care team. Professional standards require all nurses to maintain therapeutic boundaries, provide equitable care, and retain responsibility for patient education and communication.¹⁴ Perioperative nurses should not alter the completeness or clarity of patient education content based on perceived expertise or fear of scrutiny, because doing so may compromise patient safety and create inconsistent care

practices. In addition, confidentiality must be preserved regardless of a family member's credentials; information should be shared only when the patient consents or does not object and should be limited to what is relevant to that individual's involvement in care.¹⁷

Perioperative nurses should address these challenges by maintaining consistent, patient-centered communication practices and clearly defined roles. Education should be directed primarily to the patient using plain language and avoiding assumptions about baseline knowledge. The teach-back method should be used with the patient, not the family member, to confirm understanding of medications, warning signs, and follow-up care.¹⁶ Perioperative nurses should also establish expectations early in the interaction and recognize the family member as a support person rather than as a nursing professional who does not need formal education; perioperative nurses also should confirm the patient's preferences regarding information sharing. By avoiding assumptions, maintaining professional confidence and boundaries, and ensuring that the patient independently understands their care, perioperative nurses can reduce communication gaps and support safe transitions of care.

Conflict of interest disclosures: In the past 24 months, Amber Wood has not had any financial relationships with any companies whose primary business is producing, marketing, selling, reselling, or distributing health care products used by or on patients.



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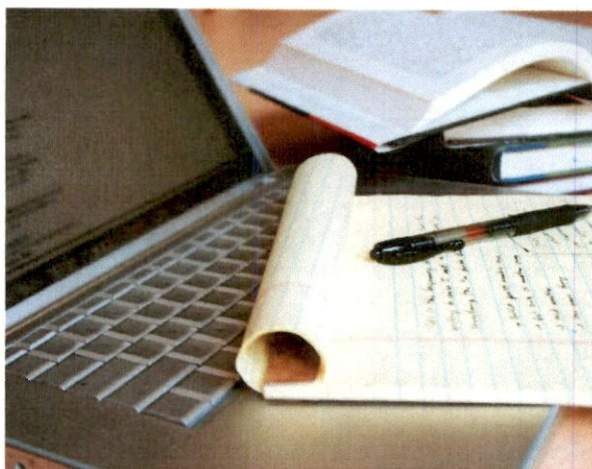


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