

A recommended universal protocol for preventing needlesticks to all allied healthcare workers in perioperative settings where intraoperative neurophysiological monitoring with subdermal needle electrodes is performed.

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SUMMARY: The purpose of this protocol is to provide intraoperative neurophysiological monitoring (IONM) personnel with guidelines and recommendations on how to help prevent needlesticks (both self-inflicted injuries as well as injuries to operating room (OR) personnel caused by IONM needle electrodes), and to subsequently improve health outcomes for the patient during surgical procedures requiring intraoperative neurophysiological monitoring. This recommended protocol is designed therefore to help develop best practices in intraoperative subdermal needle management. **BACKGROUND:** IONM healthcare workers and affiliated healthcare personnel are uniquely affected by the risks of unintended needlesticks in surgical settings where intraoperative neurophysiological monitoring is performed. The CDC, OSHA and others have widely established that unintended needlesticks can cause the transmission of bloodborne pathogens including Hepatitis B and C and HIV in healthcare settings. Anecdotal evidence suggests widespread numbers of needlestick injuries from subdermal needle electrodes during IONM procedures; particularly during the positioning of patients. Recent studies have begun to document this serious issue.¹

NEEDLE SELECTION

1. Select sterile and single use needles only. Confirm that the sterilization date has not expired.
2. Select needles that are packaged with tip protectors designed for easy removal but that remain in place in packaging. PVC tip protectors may be preferred over foam.
3. Select needles based upon the size of the patient.
4. Select needles based upon the type of procedure (e.g., spine, head).
5. Select a consistent color code for needles by anatomic location and modality identification.
3. Select tape that is packaged in individual die-cut units (not rolls) to reduce the risk of needle site infection and of cross-contamination.
4. Select tape type based upon packaging and ease of application.
5. Select transparent tape when appropriate, for enhanced needle visualization (e.g., OpSite, Tegaderm, Transpore, Blenderm, NeedleTape).^{ii, iii, iv, v, vi}
6. Select tape size and tape type for different applications. Recommended minimum size of 2" x 3" for legs and abdomen. Recommended minimum size of 1.5" x 2" for face and head.
7. Select tape constructed with a visual identifier that alerts healthcare workers that needles are present.^{vii}

TAPE SELECTION

1. Select tape based upon fixation characteristics that minimize the potential for needle dislodgement. Consider adhesive strength, compliancy to patient anatomy, and removability.
2. Select tape materials appropriate for patient skin type and any noted allergies. Use paper tape if patient has delicate skin or other tape allergies. Alert OR personnel that paper tape is being used. Ensure sufficient coverage to properly secure each needle due to the lower fixation strength of paper tape.

TAPE TECHNIQUE – Placement

1. Take time to follow all recommended steps.
2. Apply gloves and double glove when possible. Apply other PPE while following universal precautions.^{viii}
3. Organize needles and take a count of the total number of needles prior to insertion.

4. Organize tape without placing adhesive side of tape onto other surfaces prior to the application on a patient (e.g., on scrubs, mayo stand, prep stand or other surfaces).
5. Minimize the handling of tape and modification of tape (i.e., dog-ears, which may create a higher chance for incidental pull off).
6. Prepare patient skin at needle site for aseptic technique.
7. Insert needle into patient. Insert one needle at a time with twisted pairs.
8. Avoid bending needles.
9. Completely cover each individual needle or set of twisted pair needles with a single piece of tape when appropriate in order to assist in needle count and to minimize the chance for unintended needlesticks upon removal of tape and needle.
10. Create a strain relief loop in the electrode wire (lead) and tape separately from needle.
11. **Repeat steps 1-10 on each needle site.**
12. Coil, bury and secure all electrodes prior to any flip of the patient, during certain spine procedures when appropriate.
13. Remove needles if necessary when an anesthetist will be handling the head during a patient flip. Carefully replace needles with a new set following the patient flip.
14. Utilize corkscrew electrodes for TcMEP whenever possible.
15. Consider the use of a skin stapler to hold down each wire when placing needles in the patients head in order to minimize the possibility of needle dislodgement.
16. Notate and record total quantity of needles in patient, both when placed and when removed.
17. Report the quantity of needles in patient to circulating nurse and anesthesia staff, both when placed and when removed.
18. Check impedences frequently to ensure needles are secure throughout the entire duration of case.
19. Remind surgeon(s) and scrub techs to take precaution when a needle is introduced into the sterile field.

TECHNIQUE – Needle Removal

1. Apply gloves and double glove when possible. Apply other PPE while following universal precautions.
2. Cut leads 12” away from needles.
3. Remove needles one by one by holding lead in one hand and peeling tape back with other in a two-handed technique.
4. Alert all relevant and affiliated healthcare personnel of the imminent removal of corresponding needles. This includes intraoperative needle replacement.
5. Alert all relevant and affiliated healthcare personnel that needles are being migrated to a sharps container.
6. Report final count to OR circulator, document in IONM case log.
7. Dispose of each needle, either individual or paired, and tape together as one unit if possible.
8. Dispose one needle at a time in a designated sharps container.
9. Do not reprocess needles.

RESPONSE TO NEEDLESTICK INJURY

If you experience a needlestick injury, **immediately follow these steps:** (1) Wash affected area with soap and water; (2) report the incident to your supervisor; and (3) immediately seek medical treatment.

Further detailed information on how to respond to a needlestick injury can be found through the CDC (www.cdc.gov), NIOSH (www.cdc.gov/niosh) and the American Nurses Association (www.ana.org). The following is a sampling of these resources:

1. Centers for Disease Control. What to do following a sharps injury.^{ix}
2. American Nurses Association. Occupational Exposure to Blood or Other Potentially Infectious Materials by Sharps, Mucous Membrane Splashes, or Broken Skin.^x

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This protocol was derived from surveys, contributions and reviews from a collection of experts in the field of needlestick safety and prevention, and from experienced personnel within the field of intraoperative neurophysiological monitoring. Contributors include neurophysiology practitioners: Michael Ryon Fuqua (University of Colorado Hospital), Ashley Kotrady (Neuro IOM Services) and Johnny Ramos (Georgia Neurosurgical Institute).

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The mission of Marea Enterprises Inc. is to create and deploy healthcare solutions that are differentiated by use, application and the ability to provide safer procedural environments which in turn can lead to better health outcomes.

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ⁱ Abramowicz, E, Spinelli, A, Wecksell, M, Nair, S, and Catalano, M. (2011, October). *Intraoperative Neurophysiological Monitoring Poses Needlestick Injury Risk to OR Personnel and Patient*. Poster session presented at the American Society of Anesthesiologists Annual Meeting, Chicago, Illinois.

ⁱⁱ OpSite is a registered trademark of Smith and Nephew.

ⁱⁱⁱ Tegaderm is a registered trademark of 3M

^{iv} Transpore is a registered trademark of 3M.

^v Blenderm is a registered trademark of 3M.

^{vi} NeedleTape is a registered trademark of Marea Enterprises Inc.

^{vii} Andrews, C. (2011, August) Communicating Risks and Benefits: An Evidence-Based User's Guide. *Warnings and Disclosures* pp 149-161. Marquette University. Retrieved from http://epublications.marquette.edu/cgi/viewcontent.cgi?article=1107&context=market_fac.

^{viii} Centers for Disease Control and Prevention. (2008). Guidance for the Selection and Use of Personal Protective Equipment (PPE) in Healthcare. Retrieved from <http://www.cdc.gov/HAI/pdfs/ppe/PPEslides6-29-04.pdf>.

^{ix} Centers for Disease Control and Prevention. Stop Sticks Campaign. Sharps Injuries: *What to do following a sharps injury*. Retrieved from <http://www.cdc.gov/niosh/stopsticks/whattodo.html>.

^x American Nurses Association. (2011). *Occupational Exposure to Blood or Other Potentially Infectious Materials by Sharps, Mucous Membrane Splashes, or Broken Skin*. Retrieved from <http://nursingworld.org/DocumentVault/OccupationalEnvironment/Needles/Occupational-Exposure-to-Blood-or-Other-Potentially-Infectious-Materials-by-Sharps.pdf>.

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