

Clinical guidelines for the practice of peripheral nerve blocks in the adult

These guidelines have been elaborated by the Peripheral Nerve Blocks Working group of the Belgian Association for Regional Anesthesia (BARA)

Peripheral Nerve Blocks Working group : L. SERMEUS, A. PIRSON, B. BREEBAART, J. DECOSTER, E. DEREPPER, Ph. GAUTIER, E. GUNTZ, J. P. LECOQ, Cl. LONDOT, P. PANDIN, Th. PIROTTE, P. VAN HOUWE, P. VERELST, K. VERMEYLEN

Abstract : These guidelines, made by BARA, are, like the “Safety First Guidelines” of the SARB, clinical recommendations for a good and safe practice when performing peripheral nerve blocks (PNB). These recommendations were made according to the most recent literature and experts opinion and are therefore prone to changes due to evolution of literature.

The guidelines deal with “Informed Consent”, preoperative visit, monitoring, equipment and the PNB procedure itself regardless of using ultrasound or neurostimulation or both.

Advice is given when combining a PNB with general anesthesia and when a catheter technique is used.

Key words : Guidelines ; peripheral nerve ; ultrasound ; neurostimulation.

Question 1

What should the patient be told before receiving a regional anesthetic technique ?

The patient should be adequately informed in accordance with the recommendations legally defined in the Royal Decree of the 22nd August 2002 (Chapter III, art. 5-11).

Question 2

How should the patient be prepared ? Which monitoring should be applied ? When should a peripheral nerve block be performed in patients undergoing general anesthesia ?

As for any anesthetic procedure, the successive steps surrounding the practice of a peripheral nerve block may be summarized as follows :

- preoperative visit
- establishing the sequence of patients in the operative program
- intra-operative monitoring with appropriate equipment
- postoperative monitoring in a specially dedicated area

2.1. Preoperative visit

Preoperative assessment should adhere to the same criteria as for any general anesthetic procedure

2.2. Immediate preoperative preparation prior to instituting a peripheral nerve block :

- 2.2.1. There are no specific differences in the choice of premedication used, although the use of opioids is best avoided.
- 2.2.2. The rules concerning preoperative fasting should be applied as per usual.
- 2.2.3. A peripheral venous catheter should be inserted beforehand.
- 2.2.4. It is essential to keep the patient warm and comfortable, and to respect personal intimacy.

Correspondence address : Luc Sermeus, M.D., President of BARA, Department of Anesthesia, Antwerp University Hospital, Wilrijkstraat 10, 2650 Edegem, Belgium.
E-mail : luc.sermeus@uza.be
BARA, UZ Leuven, Herestraat 49, 3000 Leuven, Belgium.
Tel. : 016/348652. E-mail : secretariat@bara2001.be

2.3. Monitoring and the hospital location in which the peripheral nerve block is performed.

According to the recommendations made in Safety First (1, 2) (see below, point 4.4), all anesthetic procedures, either general or regional, should be administered in a properly equipped area for the administration of anesthesia, patient monitoring and the support of vital functions. Basic resuscitation medication should be complemented by the presence of Intralipid® 20%, 1000 mL, immediately available in the theatre, and a protocol for the administration of Intralipid® should also be available.

Monitoring should be the same as for general anesthesia and should be in place before starting the block.

2.4. Procedural sedation

Sedation may be advantageous when instituting peripheral nerve blocks that are known to be potentially painful, as well as in patients who appear particularly anxious. The experts all agree in recommending only light sedation, by which the patient remains co-operative and responds easily to verbal and sensory stimulation.

2.5. Performing the peripheral nerve block.

2.5.1. Assistance for performing the block : The anesthetist should always be assisted by a competent and trained individual when instituting a peripheral nerve block.

2.5.2. Skin disinfection should always be performed and in the same manner as for a surgical procedure. The disinfected area should be broad enough to allow the operator working without draping the patient. Alternatively, sterile drapes should be used properly.

2.5.3. It is recommended that the injection of the local anesthetic solution be slow and be administered in divided boluses, with frequent aspiration tests. It is also recommended that the injection be stopped in the presence of pain, paresthesia or resistance to injection. When using echography, the injection should also be stopped when the diffusion of the local anesthetic solution cannot be

visualized and/or is seen to be associated with nerve swelling.

2.5.4. A peripheral nerve stimulator at low current intensity and/or a pressure monitor increases the likelihood of detecting an intra-neural injection when using echography.

2.5.5. The addition of adrenaline to the local anesthetic solution during any bolus injection (with the exception of boluses delivered by a patient-controlled analgesia pump) increases the likelihood of detecting an intravascular injection.

2.5.6. In case of surgery being performed under peripheral nerve block alone, the block should first be evaluated before the beginning of the procedure.

2.6. Monitoring of the anesthetic block

Monitoring of the anesthetic block begins with the evaluation of block onset and effectiveness during the preoperative phase, and is continued intra- and postoperatively if an epineural catheter has been placed.

2.6.1. The progressive installation of the anesthetic block represents a critical phase and, as such, necessitates a close monitoring of the patient (standard monitoring modalities). Verbal and visual contact with the patient should be maintained after the injection of the local anesthetic solution.

2.6.2. After testing the peripheral nerve block and following surgical incision, perioperative monitoring can be entrusted to a competent trained individual who maintains verbal and visual contact with the patient, provided the anesthesiologist that is responsible for this only program, remains in the vicinity of the operating room and is able to quickly respond to any emergency. In case of partial or complete anesthetic block failure, the progress of surgery has to be prevented, and an escape block or general anesthesia has to be performed. In such an eventuality, the anesthesiologist must be present for the remainder of the procedure (Safety First) (1, 2).

2.6.3. An epineural catheter must be clearly identified so that it cannot be mixed up with an intravenous venous catheter, or with a catheter of any other nature.

2.6.4. As for any single shot peripheral nerve block, the placement of an epineural catheter, as well as the first bolus injection, are carried out by the responsible anesthesiologist, while monitoring vital parameters. If postoperative analgesia is provided using a continuous infusion of local anesthetic agents, the pump solution may be renewed by a nurse, provided that clear written instructions are available. Monitoring of this analgesic technique as well as the removal of epineural catheters can be entrusted to a nurse working within the confines of a specific written procedure (Art. 5 Royal Decree 18th June 1990).

2.6.5. In order to provide continuity of care, an anesthesiologist should always be available to deal with possible problems when postoperative analgesia is provided by continuous epineural catheter infusions.

2.7. Timing of peripheral nerve blockade when combined with general anesthesia.

The combination of general and regional anesthesia may be planned beforehand to ensure patient comfort during surgery. This may be related to positioning constraints, anticipated long surgery duration, or postoperative analgesia necessities. General anesthesia may also be necessary as a rescue technique, should the peripheral nerve block fail. Noteworthy, the surgical team should be informed as to the presence of a postoperative sensory or motor block.

2.7.1 In order to benefit from regional analgesia during the surgical procedure, it is recommended that the peripheral nerve block be performed beforehand.

2.7.2. It is recommended that all peripheral nerve blocks be instituted in awake, calm and collaborating patients, possibly using light sedation. However, in exceptional circumstances where the

risk/benefit ratio is considered justifiable, a peripheral nerve block may be performed under general anesthesia. It is also recommended that, in the presence of central neuraxial blockade, peripheral nerve blocks be performed only when the sensory block of the former has regressed.

Question 3

What are the recommendations for intravenous regional anesthesia (IVRA) ?

3.1. Due to the high risks of toxicity associated with IVRA, the experts agree in recommending the presence of an anesthesiologist while this technique is performed, as well as during the surgical procedure itself. In particular, the anesthesiologist must be present when the tourniquet is deflated.

Question 4

Which equipment and which measures should be used for peripheral nerve blockade ?

4.1. Neurostimulation and echography are the only two techniques that are currently recommended for identifying nerve structures during peripheral nerve blockade.

4.2. It is recommended that needles and catheters specifically developed for peripheral nerve blockade be used.

4.3. Sterility/Hygiene

A sterile environment is mandatory for the administration of regional anesthesia. Rigorous attention to asepsis should be applied when placing an epineural catheter. Due to the risk of cross contamination, it is recommended that echography transducers be used with single dose sterile gel and protected by a sterile, single use sheath.

4.4. Guidelines

We would like to refer to the "Safety-first" guidelines of the SARB that can be found at the following addresses : <http://www.sarb.be/>

nl/activiteiten/bsar/saf_first_nl.htm for the Dutch version, http://www.sarb.be/fr/activiteiten/sbar/saf_first_fr.htm for the French version.

We would also like to refer to the “Belgian guidelines concerning central neural blockade in patients with drug-induced alteration of coagulation : An Update” that can be found at the following address : http://www.bara2001.be/downloads/documentation/Belgian_Guidelines_2005.pdf

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Recommended readings

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