

Indications and Contraindications for Regional Anesthesia

There are several similarities for indications and contraindications for peripheral nerve block and neuraxial blockade. For this reason we will cover both now. Despite the similarities it is important to cover each category of regional anesthesia separately. Pay close attention to the differences.

There are several factors to consider when choosing anesthetic technique options. Your ability to perform a variety of regional anesthetic techniques enhances your flexibility, offering your patient a number of options.

Peripheral Nerve Blocks

Peripheral nerve blocks are safe and effective alternatives to general and neuraxial anesthesia. Knowledge of anatomy and pharmacology are essential for successful administration. The ability to perform a variety of peripheral nerve blocks will enhance the anesthesia providers' flexibility and offer the patient additional options for their care.

Indications for Peripheral Nerve Block

A careful review of the patient's history will yield valuable information enabling the anesthesia provider to make an informed decision on the best options. For example, a peripheral nerve block may be used as the sole anesthetic (with or without sedation), as a supplement to general anesthesia, and/or postoperative analgesia. General considerations include:

- Suitability for the type of surgery being performed
- Surgeon's preferences
- Experience in performing the block
- Physiological and mental state of the patient

When obtaining informed consent include options and risks/benefits. It is acceptable to present to the patient with what may be the best choice based on co-morbidities. The final decision is the patients. Most patients are accepting of the anesthesia provider's opinion, if presented in a manner that can be clearly understood. Never try to scare a patient into a regional anesthetic. Be gentle and objective when presenting options. The following are general advantages:

- Improved patient satisfaction (especially in elderly)
- Less immunosuppression, compared to general anesthesia
- Decreased incidence of nausea and vomiting
- A non general anesthesia option for patients with a history of malignant hyperthermia
- Alternative for patients who are hemodynamically unstable or too ill to tolerate general anesthesia
- Less post operative cognitive impairment, especially in the elderly

General risks include:

- Toxicity of local anesthetics
- Transient or chronic paresthesia
- Nerve damage. Never inject if the patient experiences pain, there is an increased resistance to injection. Never use sharp “cutting” needles. If only sharp needles are available then blunt the needle using the sterile plastic sheath that comes with the needle. Maintain sterility. This is not “ideal” and will still place the patient at risk for injury but may be the only option in environments where resources are limited.
- Intra-arterial injection, seizures, or cardiac arrest
- Block failure, the need to supplement or convert to general anesthesia
- Infection

Contraindications to Peripheral Nerve Blocks

Some contraindications for peripheral nerve blocks are relative and others are absolute. Absolute contraindications include:

- Patient refusal
- Infection at the injection site. The insertion of a needle through infected into healthy tissue may spread infection. In addition, local anesthetics do not work well in acidotic tissue.
- An allergy to local anesthetics. Ensure that it is a “true” allergy. Some patients may report symptoms such as dizziness, nausea, etc during dental anesthesia. Ask the patient if they had trouble breathing, a rash, and other symptoms that would indicate a “true” allergy. If the patient had a true allergic reaction to a local anesthetic, identify which local anesthetic. Ester local anesthetics have a higher incidence of allergic reactions, related to their metabolism to PABA. Amide local anesthetics have a very low incidence of allergic reactions. There are no cross reactions between amides and esters. A true allergy is an absolute contraindication to a peripheral nerve block with the offending local anesthetic or others in the same class.
- The inability to guarantee sterile equipment to perform the block is an absolute contraindication. This could result in the introduction of infectious agents in otherwise healthy tissue.
- If the risk of local anesthetic toxicity is great (i.e. one would not want to perform a bilateral axillary block; or repeat one). Do not exceed the maximum dose for local anesthetics.

Relative contraindications include:

- Pediatric, combative, and/or demented patients. For pediatric patients, most blocks are placed after general anesthesia. This practice is discouraged for adults due to the risk of intraneural injection. In addition, the patient is unconscious and unable to report subjective symptoms of impending toxicity, associated with an intravascular injection. Demented/combatative patients present the challenge of remaining still during the surgical procedure.
- Bleeding disorder (medication induced i.e. coumadin; or genetic i.e. hemophilia; or acquired i.e. DIC). Hematoma formation may increase the risk of ischemic nerve damage. In the case of an extremity or end organ, it can lead to a tourniquet syndrome and ischemia (i.e. ankle, digits, etc.)

- Pre-existing peripheral nerve neuropathies may increase the risk for permanent nerve damage. Careful documentation of sensory and motor deficits should occur prior to the initiation of a peripheral nerve block.

Neuraxial Blockade

Neuraxial blockade encompasses both spinal and epidural anesthesia. Neuraxial blockade offers several advantages to the patient when compared to general anesthesia. These include:

- Decreased incidence of nausea and vomiting
- Decreased blood loss
- Decreased incidence of graft occlusion
- Improved mobility following major knee surgery
- Superior pain control in the immediate postoperative period
- Decreased alteration in the patient's cardiopulmonary physiological status
- Improved patient satisfaction (especially in elderly)
- Less immunosuppression
- An alternative to general anesthesia for patients with a history of malignant hyperthermia
- An alternative for patient's that may not tolerate a general anesthetic
- Less cognitive impairment (especially in the elderly)
- Enhances flexibility/options for anesthetic care

Considerations

There are several factors that the anesthesia provider should consider when deciding on which anesthetic techniques to present to the patient. Examine the patients back for surgical scars, scoliosis, skin lesions, and surface anatomy that may make neuraxial blockade difficult. There are no routine preoperative tests for healthy patients undergoing neuraxial blockade. However, patients with a history of medications/medical conditions that may increase the risk of bleeding should have coagulation studies and platelet counts drawn. The patient should be assessed for thrombocytopenia prior to the initiation of neuraxial techniques. The following signs and symptom may indicate bleeding tendencies:

- Blood in the urine
- Bleeding around the gums
- Petechiae (small purple colored spots on the skin)

In addition the patient should be carefully questioned:

- Do you bruise easily?
- Do you bleed easily?
- Do you have problems with forming a blood clot?

Generic Indications for Neuraxial Blockade

A careful review of the patient's history will yield valuable information, enabling the anesthesia provider to make an informed decision on the anesthetic technique. Neuraxial blockade may be a suitable option. Neuraxial blockade may be performed as the sole anesthetic (with or without sedation), combined with general anesthesia to decrease anesthetic requirements, or used for postoperative analgesia. Specific indications for epidural and spinal anesthetics will be covered under each technique. General considerations include the following:

- Suitability for the type of surgery being performed
- Surgeon's preference
- Experience in performing neuraxial blockade
- Physiological condition of the patient
- Is the patient mentally prepared to accept neuraxial blockade and temporary loss of motor/sensory function?
- No known contraindications to neuraxial blockade

When obtaining informed consent, include all the options and risks/benefits for each anesthetic technique (i.e. general v.s. neuraxial blockade). It is acceptable to present what may be the best choice to the patient. It is important to explain why, based on co-morbidities. The final decision is the patients. Most patients are quite accepting of the anesthesia providers' opinion, if presented in a manner that can be clearly understood. Never try to scare a patient into a neuraxial block. Be gentle and objective when presenting options. An explanation is often sufficient to help the patient make an informed decision.

Share with the patient specific complications/risks associated with neuraxial blockade. General risks include the following:

- Toxicity of local anesthetics (with epidural techniques)
- Transient or chronic paresthesia
- Nerve damage
- Intra-arterial injection, seizures, or cardiac arrest
- Block failure and the need to supplement or convert to general anesthesia

The acceptance of neuraxial blockade will provide the anesthesia provider with a cooperative patient which is essential to success. Carefully explain the procedure and what the patient should expect.

Contraindications for Neuraxial Blockade

Absolute Contraindications:

- Patient refusal
- Inability to guarantee sterility of medications/equipment
- Infection at the site of injection
- Coagulopathy (acquired, induced, genetic)

- Severe hypovolemia. Hypovolemia should be corrected prior to spinal anesthesia. A spinal anesthetic in a severely hypovolemic patient may lead to cardiac arrest.
- Increased intra-cranial pressure (i.e. brain tumor or recent head injury)
- Severe aortic stenosis
- Severe mitral stenosis
- Ischemic hypertrophic sub aortic stenosis
- Severe uncorrected anemia
- An allergy to local anesthetics. Ensure that it is a “true” allergy. Some patients may report symptoms such as dizziness, nausea, etc. during dental anesthesia. Ask the patient if they had trouble breathing, a rash, and other symptoms that would indicate a “true” allergy. If the patient had a true allergic reaction to a local anesthetic, identify which local anesthetic. Ester local anesthetics have a higher incidence of allergic reactions, related to their metabolism to PABA. Amide local anesthetics have a very low incidence of allergic reactions. There are no cross reactions between amides and esters. A true allergy is an absolute contraindication to a neuraxial blockade with the offending local anesthetic or others in the same class.

Relative Contraindications:

- Sepsis (may spread infection to subarachnoid/epidural space)
- Uncooperative patient (dementia, psychosis, emotional instability)
- Preexisting neurological deficits (hard to differentiate natural progression versus neurological trauma related to neuraxial blockade)
- Demyelinating lesions (i.e. multiple sclerosis may be exacerbated by the stress of surgery, temperature changes, or natural progression. However, it may be difficult to differentiate these potential causes from the use of spinal anesthesia.)
- Stenotic valvular heart lesions
- Severe spinal deformity

Controversial:

- Prior back surgery
- Inability to communicate with the patient
- Complicated surgeries that may involve a prolonged amount of time to perform, major blood loss, and maneuvers that may compromise respiration.

References

Kleinman, W. & Mikhail, M. (2006). Spinal, epidural, & caudal blocks. In G.E. Morgan et al *Clinical Anesthesiology, 4th edition*. New York: Lange Medical Books.

Morgan, G.E., Mikhail, M.S., Murray, M.J. (2006). Peripheral nerve blocks. In G.E. Morgan et al *Clinical Anesthesiology, 4th edition*. New York: Lange Medical Books.

Warren, D.T. & Liu, S.S. (2008). Neuraxial anesthesia. In D.E. Longnecker et al (eds) *Anesthesiology*. New York: McGraw-Hill Medical.