

ACQUIRE clinical update

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Pain Management for Female Sterilization by Minilaparotomy

Introduction

This document addresses considerations of pain management for female sterilization by minilaparotomy in EngenderHealth's service delivery programs. Female sterilization by minilaparotomy is an ambulatory surgical procedure usually performed under local anesthesia with appropriate sedation and analgesia by a skilled clinical services provider. The purpose of pain management is to reduce a client's anxiety and her perception and experience of discomfort and pain, thus allowing surgery to proceed. Local anesthesia with sedation and analgesia has proven to be the most appropriate anesthetic regimen for female sterilization by minilaparotomy, and has allowed numerous health institutions to provide female sterilization services safely, even in limited-resource settings (1, 2).

Guiding Principles of Pain Management for Female Sterilization by Minilaparotomy

- Clients undergoing female sterilization by minilaparotomy should receive adequate analgesia and sedation that minimizes their anxiety and pain and maximizes comfort.
- Even in limited resource situations, adequate pain management is feasible and necessary.
- Drugs chosen for sedation and analgesia should be safe, affordable, readily available, and in regular supply.
- Because risks increase with the depth of sedation, the lightest depth of sedation and analgesia needed to adequately control pain and anxiety is preferable.
- Pain management should begin before the procedure, with preoperative counseling and medication aimed at allaying anxiety, should ensure as much comfort as possible during the procedure, and should continue into the postoperative period.

Sedation and Analgesia: Definitions and Levels

Sedation decreases anxiety and promotes somnolence, and analgesia relieves pain. There is a continuum of depth of sedation and analgesia that ranges from minimal sedation to general anesthesia. Along this continuum, four states and levels of sedation-analgesia have been defined and characterized by the American Society of Anesthesiologists (3):

1. *Minimal Sedation*

Minimal sedation is a drug-induced state of reduced or eliminated anxiety during which clients are able to respond normally to verbal commands. Cognitive function and coordination may be impaired, but ventilatory and cardiovascular functions are not affected, and no intervention is needed to maintain a patent airway. (Examples of minimal sedation include peripheral nerve blocks, local or topical anesthesia, and a single, oral sedative or analgesic medication administered in doses appropriate for the unsupervised treatment of insomnia, anxiety, or pain.)



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2. Moderate Sedation/Analgesia (Conscious Sedation)

Moderate sedation/analgesia (or conscious sedation) is a drug-induced state of depressed consciousness during which clients can respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. Spontaneous ventilation is adequate, and no interventions are required to maintain a patent airway. Cardiovascular function is usually maintained. (Moderate sedation/analgesia is usually attained with a combination of a sedative, such as diazepam, with a low dose of a narcotic analgesic.)

3. Deep Sedation/Analgesia

Deep sedation is a drug-induced state of depressed consciousness during which clients cannot be easily aroused but are able to respond purposefully following repeated or painful stimulation. Spontaneous ventilation may be inadequate, and intervention may be required to maintain a patent airway. Cardiovascular function is usually maintained. (Deep sedation/analgesia is induced by the same types of medication as moderate sedation/analgesia, but using higher doses and/or a more rapidly absorbed route—e.g., intravenous rather than intramuscular administration.)

4. General Anesthesia

General anesthesia is a drug-induced loss of consciousness during which clients cannot be aroused, even by painful stimulation. The ability to maintain spontaneous ventilation is often impaired, and clients often need assistance in maintaining a patent airway. Cardiovascular function may be impaired.

Recommended Pain Management and Anesthetic Regimen for Female Sterilization by Minilaparotomy, and Rationale*

Moderate sedation/analgesia (conscious sedation) in combination with local anesthesia is the recommended regimen for pain management and anesthesia in surgical conduct of female sterilization by minilaparotomy, for reasons of safety, comfort and access. This should be supplemented by good verbal communication and support throughout the procedure. The rationales for this recommendation are that moderate sedation/analgesia with local anesthesia:

- Entails less cardiorespiratory depression, lower peak drug blood levels, and faster recovery—and thus lower risks of unexpected and life-threatening complications[†]—than does deeper sedation or general anesthesia
- Provides a client adequate comfort, with minimal or no anxiety or pain
- Is less complicated and expensive than general anesthesia, given the equipment and level of training required for general anesthesia, and thus allows female sterilization services to be more widely available, accessible, and used

Analgesic and Sedative Drugs for Female Sterilization by Minilaparotomy

Selection of a specific regimen for sedation and analgesia for female sterilization by minilaparotomy depends on many factors, including the experience and technical capabilities of the providers on the surgical team, the safety and comfort of the client, the availability and cost of equipment and drugs, the service site's emergency management capability, and local policies and protocols. The purpose, timing, dosages, and routes of administration of drugs commonly used for sedation and analgesia are listed in Table 1 (page 4). Combinations of these drugs may be administered to attain moderate sedation/analgesia (conscious sedation); commonly used combinations vary among different countries; each component should be administered individually to achieve the desired effect (sedation and/or analgesia, with additional analgesic medication given if necessary to relieve pain or discomfort, or additional sedative medication given to decrease anxiety) (3).

* General anesthesia may be indicated for a procedure that is expected to be difficult (e.g., with extreme obesity, surgical scars, or pelvic pathology). General (or regional) anesthesia should only be used in settings properly equipped to provide such anesthesia and to handle related emergencies that may arise.

[†] It is not always possible to predict how a client will respond to sedative-analgesic medications. Providers thus must be ready and able to recognize and immediately manage clients whose level of sedation becomes deeper than initially intended. For moderate sedation/analgesia, this means being able to manage a compromised airway or hypoventilation in a client who only responds purposefully after repeated or painful stimulation. Reversal agents and other appropriate drugs and equipment for emergencies must also be available and near at hand.

Local Anesthesia for Pain Management during Female Sterilization by Minilaparotomy: Considerations and Recommendations

- Local anesthesia should be used in all conscious clients undergoing minilaparotomy for female sterilization.
- The goal of local anesthesia is to achieve an anesthetic field block that penetrates all layers of the abdominal wall, from skin to peritoneum.
- Lidocaine (Lignocaine) is the recommended local anesthetic, as it is widely known, available worldwide, and inexpensive, and most providers know how to use it safely.
- The recommended concentration and formulation is 1% lidocaine without epinephrine, at a dosage of 4.5 mg/kg (2 mg/lb) of body weight.[‡]
- The onset of anesthetic action of lidocaine without epinephrine typically takes three to five minutes, after which the procedure may begin; the anesthetic effect lasts for up to 30–45 minutes.
- Sedatives and analgesics should not be used to compensate for inadequate local anesthesia.

Communicating with the Client to Reduce Anxiety and Pain

Providing basic explanatory information about the anesthesia and surgical procedures during counseling, the preoperative interview, and the surgery itself helps diminish a client's anxiety and thus supplements the use of sedative/analgesic drugs. During surgery, the client should be given simple, reassuring explanations of what is occurring, what she may experience, or what will be happening next; this is especially important during actions that can cause more discomfort or pain (e.g., when administering injectable drugs and local anesthetic, opening the peritoneum, or grasping and manipulating the fallopian tubes). Such communication helps reduce the client's anxiety and perceptions of pain (and also helps providers monitor her level of consciousness) (2).

Pain Management in the Postoperative Period

The moderate sedation/analgesia used for female sterilization by minilaparotomy typically is sufficient to control pain during the operative period and into the immediate postoperative period. Upon discharge, oral analgesics (e.g., ibuprofen or diclofenac) can be prescribed or given, to be taken at home every 4-6 hours as need during the first few days after the procedure.

References

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5. Barash, P., Cullen, B., and Stoelting, R. 2005. *Handbook of clinical anesthesia, 4th ed*. Philadelphia: Lippincott, Williams, and Wilkins.
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[‡] Solutions of 2% lidocaine can be diluted to a 1%—or even 0.5%—solution using sterile normal saline or sterile water. Lower concentrations provide the same amount of anesthetic in a greater volume, which facilitates infiltration of all layers of the abdominal wall and improves the anesthetic effect.

Table 1. Drugs for Sedation/Analgesia for Female Sterilization by Minilaparotomy

(Sources: 2, adapted from 4 and 5, and 6)

Drug	Dosage/Route of Administration/Timing
Minimal Sedation —generally administered orally, in outpatient area	
Sedation: Diazepam	2–10 mg by mouth, 45–60 minutes prior to entering operating theater (OT)
Nonnarcotic Analgesic* Diclofenac or Ibuprofen	<ul style="list-style-type: none"> • 75 mg of diclofenac by mouth, 45–60 minutes prior to entering OT; or • 400 mg ibuprofen by mouth, 45–60 minutes prior to entering OT
Moderate Sedation —administered intramuscular (IM) or intravenous (IV) in OT	
Sedatives	
Midazolam (rapid-acting)	<ul style="list-style-type: none"> • IM: 2.5 to 10 mg (0.05 to 0.2 mg/kg), in OT, 5–10 minutes prior to start of procedure • IV: 0.5 to 5 mg (0.025 to 0.1 mg/kg), given <i>slowly</i> immediately prior to start of procedure
Diazepam	<ul style="list-style-type: none"> • As <i>oral premedication</i>: see above • For <i>moderate sedation</i>: 2 to 10 mg (0.05 to 0.2 mg/kg) <i>slow</i> IV immediately prior to start of procedure
Promethazine	<i>Premedication/Moderate Sedation</i> : 12.5 to 50.0 mg, IV, IM (deep), or by mouth; timing depends on the route of administration
Narcotic Analgesics	
Fentanyl (rapid-acting)	25 to 100 µg (0.7 to 2 µg/kg) IV or IM, immediately prior to start of procedure
Pentazocine	30 mg IM, in OT, 10–15 minutes prior to start of procedure
Meperidine (Pethidine)	<ul style="list-style-type: none"> • IM: 50 to 150 mg (1 to 3 mg/kg), in OT, 5–10 minutes prior to start of the procedure; or, • IV: 25 to 100 mg (0.5 to 2 mg/kg), given <i>slowly</i> immediately prior to start of procedure
Nalbuphine	<ul style="list-style-type: none"> • IM: 5 to 10 mg (0.1 to 0.3 mg/kg), in OT, 5–10 minutes prior to start of procedure; or, • IV: 5 to 10 mg (0.1 to 0.3 mg/kg) immediately prior to start of procedure
Nonnarcotic, Dissociative Analgesia/Anesthesia	
Ketamine (clients should be premedicated first/separately with a sedative)	<i>Sedation/Analgesia</i> IM: 2.5 to 5 mg/kg immediately prior to start of procedure IV: 0.5 to 1 mg/kg immediately prior to start of procedure
	<i>Anesthesia induction</i> : 1 to 2.5 mg/kg IV

* Nonnarcotic analgesics like ibuprofen or diclofenac (which are nonsteroidal antiinflammatory drugs, or NSAIDs) can be used before surgery begins to help reduce uterine cramping and/or to decrease postsurgical pain.

Note: Atropine, neither a sedative nor an analgesic, is also often used for female sterilization by minilaparotomy, to decrease oral secretions, prevent intraoperative bradycardia (slowed heartbeat during surgery), and decrease the possibility of vasovagal syncope or cardiac arrest. The usual dosage of atropine is 0.6 mg, given IM or IV.

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