

4. MEDICATIONS AND PAIN MANAGEMENT

This chapter describes methods of pain control as well as routine medications used before, during, and after uterine aspiration (for abortion or miscarriage management). Medications indicated for clinical emergencies are also reviewed.

CHAPTER LEARNING OBJECTIVES

Following completion of this chapter, you should be better able to:

- ☐ Describe the role of prophylactic antibiotics and cervical ripening in uterine aspiration.
- ☐ Describe the various options for pain control, including non-pharmacologic methods, used during uterine aspiration, and the evidence for their effectiveness.
- ☐ Describe technique and precautions for paracervical block.
- ☐ Describe the differences in necessary monitoring and personnel for different types of anesthesia.
- ☐ Identify indications and dosages for medications used in clinical emergencies.
- ☐ Know the location and availability of emergency supplies in your clinical setting.

READINGS / RESOURCES

- ☐ National Abortion Federation (NAF). Management of Unintended and Abnormal Pregnancy (Paul M. et al, Wiley-Blackwell, 2009)
 - Chapter 8: Pain Management
- ☐ National Clinicians' Post-Exposure Prophylaxis Hotline
 - 1-888-HIV-4911 (1-888-448-4911)

SUMMARY POINTS

SKILL

- Pain perception includes both physical and psychosocial elements, and is best managed with both pharmacological and non-pharmacological techniques.
- Paracervical block helps reduce pain, and there are many variations on technique.
- Oral medications such as NSAIDs, opioids or anxiolytics may be used individually or together.
- Intravenous pain management may be chosen if time, monitoring, and staffing are available. General anesthesia is still used in some circumstances.

SAFETY

- Universal pre-procedure antibiotic prophylaxis for aspiration abortion is well supported by the available evidence.
- Medications used for pain control are arguably the area of greatest risk associated with the procedure and may require provision of respiratory support.
- Pay close attention to allergies, concurrent medications, conditions that compromise respiratory status, recommended dose limits, and antidotes.
- Make sure you know where the emergency cart or supplies are kept in your clinical setting, and review the procedures for emergencies and hospital transfer.

ROLE

- Do not underestimate the helpfulness of deep-breathing techniques, distraction through conversation, the support of a partner, friend or medical assistant, gentle operative technique, and the reassuring tone of your voice and words.

PRE-PROCEDURE MEDICATIONS

PROPHYLACTIC ANTIBIOTICS

There is strong evidence for the use of routine antibiotic prophylaxis in all subgroups of women undergoing uterine aspiration. In the meta-analysis of 12 studies, there was a 42% overall reduction in postabortal infection rates with antibiotics compared to placebo (Sawaya 1996). This protective effect was evident in women with and without risk factors (history of PID, positive CT, or pre-operative BV). Evidence supports pre-procedure dosing of prophylactic antibiotics for the maximal effect, and the shortest course possible to give the lowest risk of adverse reactions and antibiotic resistance. Despite varying practices in choice of antibiotic and duration of use, there is little data to support post-procedure antibiotics (Achilles 2011).

CERVICAL PREPARATION

There has been much research into the role of misoprostol and other methods of cervical ripening for uterine aspiration. Cervical preparation is not routinely indicated prior to a first trimester uterine aspiration (SFP 2007, Templeton 2012) due to increased waiting time, bleeding, cramping, other side effects, and minimal demonstrated benefit. The use of cervical preparation can be considered on an individual basis when a challenging dilatation is anticipated (such as history of difficult dilation). Use for a minimum of 1.5 hours, but up to 3 – 4 hours for best effect.

RHOGAM

RhoGam is recommended to prevent the isoimmunization of Rho-D negative women at the time of therapeutic or spontaneous abortion, and ectopic pregnancy (ACOG). Minimal gestational age at which sensitization can occur is uncertain. Since the introduction of RhoGam in late pregnancy and postpartum, the incidence of isoimmunization has fallen over 8-fold (ACOG). Given its success in term pregnancies, its use has been extended to early first trimester, even though the evidence is sparse.

PAIN MANAGEMENT

Perception of pain is a complex phenomenon influenced by both physical and psychosocial elements, and as such, can vary considerably between individuals. Many variables have been studied and the table below summarizes the research to date.

PREDICTORS OF PAIN ASSOCIATED WITH UTERINE ASPIRATION

Increased Pain	Decreased Pain	Conflicting Results	Not Strongly Predictive
Anxiety/depression Ambivalence Expectation of pain Younger patient age Dysmenorrhea Fewer pregnancies	Previous vaginal delivery Older patient age More pregnancies Shorter operative time	Gestational age Max cervical dilation Comfort w/ decision Provider experience	Manual vs. electric vacuum aspiration Prior pelvic exam Prior abortion Prior cesarean section

REASSURANCE AND RELAXATION

Supportive verbal communication, “verbicaine”, or distraction can play a significant role in reducing a woman’s anxiety and pain. Some women are inordinately anxious about anticipated procedural pain. Providers can acknowledge the possibility of pain without overly alarming patients. Including elements of positive suggestion may help to allay concerns. For example,

“Most patients are worried about pain, and are often surprised when the procedure is easier and faster than they expected. I can’t promise that you won’t feel any pain, but I will be as gentle as possible. I will be giving you a local anesthetic and will show you some breathing techniques to relax. Avoiding clenching your muscles will also help.”

Guiding patients to take slow, deep, regular breaths assists in relaxation, avoids hyperventilation, and also gives an increased sense of control. Patients can be encouraged to relax their hips into the table, to help overcome any urge to pull away.

Some women fear cervical injection more than of the procedure itself. Avoid reference to “injection” or “needle”, instead using non-specific language.

“You might feel a pinch or pressure from the medicine that will numb your cervix.”

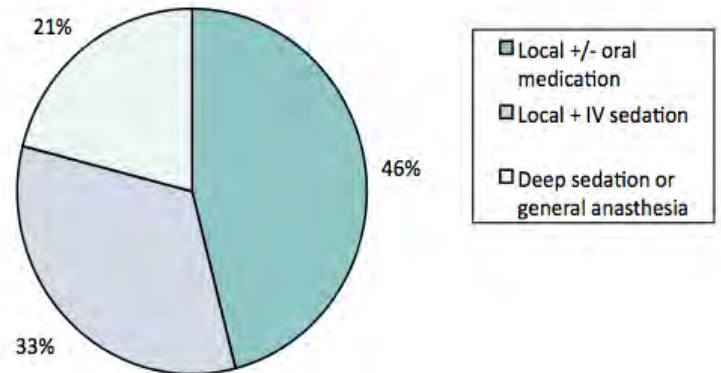
Mention that as cramps become more intense, the procedure is near the end.

“The cramps you are experiencing mean your uterus is getting smaller and the procedure is almost over.”

Studies have shown that guided imagery can decrease anxiety and analgesic requirements for surgical patients (Gonzales 2010). The patient may be invited to describe a favorite place or activity, and to recall that place during the procedure.

PREFERRED ANESTHESIA METHODS

Preferred method of anesthesia for first-trimester surgical abortion cases performed by responding NAF clinics in 2001 ($n=110$) (O'Connell, 2009)



CONTINUUM OF SEDATION LEVEL

Various approaches to pain management may be offered to patients, depending on the clinical situation and resources. Below is a short summary of the levels of sedation, examples of medications used, and the associated risks.

Level of Sedation	Example	Responsiveness	Airway	Spontaneous Ventilation	Cardiovascular Function
Minimal (Anxiolysis)	Oral lorazepam and / or hydrocodone	Normal response to verbal stimulation	Unaffected	Unaffected	Unaffected
Moderate "Conscious Sedation"	Fentanyl 50-100 mcg + Midazolam 1-3 mg IV	Purposeful response to verbal or tactile stimulation	No intervention required	Adequate	Usually maintained
Deep	Add propofol or higher doses of meds used for moderate sedation	Purposeful response following repeated or painful stimulation	Intervention may be required	May be inadequate	Usually maintained
General Anesthesia	Propofol or other medications	Unarousable even with painful stimuli	Intervention often required	Frequently inadequate	May be impaired

Based on Continuum of Depth Sedation: Definition of General Anesthesia and levels of Sedation/Anesthesia, 2009, ASA.

CHOICE OF PAIN CONTROL METHODS

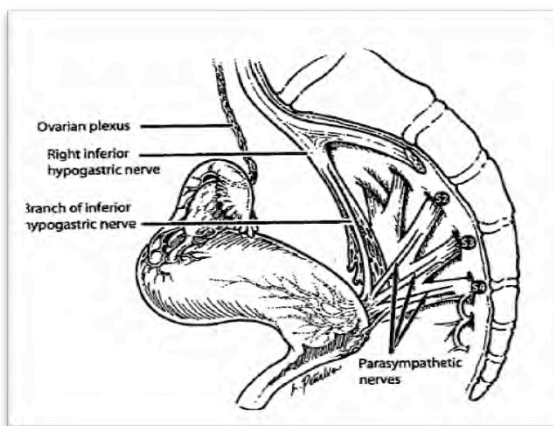
Relevant information about pain management should be reviewed as part of the informed consent process, including the range of possible pain experiences, available options for pain control, as well as their risks and benefits. If a woman has a strong preference for an option your facility does not offer, an appropriate referral may be given. Some women choose a less sedating option to be more alert, have shorter recovery, or to drive themselves home. Others choose a more sedating option to be more relaxed, to manage higher levels of anxiety, or to manage a later procedure. Lastly, some medical conditions, monitoring, or facility limitations preclude deeper sedation.

MONITORING GUIDELINES

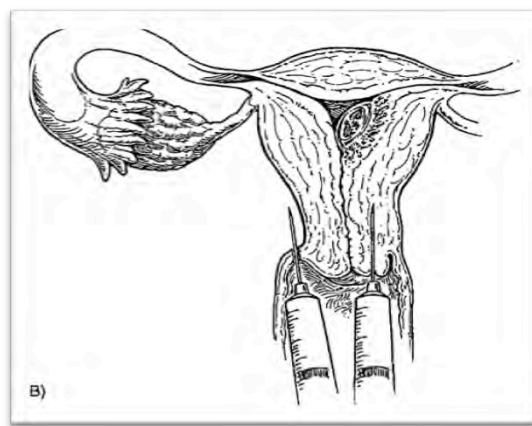
1. When moderate sedation is used, a person other than the clinician must be present who is trained to monitor appropriate respiratory, cardiovascular and neurologic parameters, including level of consciousness.
2. The personnel administering moderate sedation must recognize that conscious sedation may lead to deep sedation with hypoventilation and be prepared to provide respiratory support.
 - a. Pulse oximetry should be used to enhance monitoring.
 - b. IV access should be considered.
 - c. The patient should be checked frequently for verbal responsiveness.
 - d. Patients with severe systemic disease should receive care by an anesthesia professional.
3. When moderate sedation is used, monitoring must be of a degree that can be expected to detect the respiratory effects of the drugs being used.
4. The practitioner administering general anesthesia or deep sedation must be certified according to applicable local, hospital, and state requirements.

PROVIDING EFFECTIVE LOCAL ANESTHESIA

For uterine aspiration, local anesthesia with supplemental oral or IV medication is the most frequently used approach (O'Connell 2009). Below are some techniques and pitfalls of the paracervical block, common preparations, and review of innervation and injection approach.



Innervation of the uterus: paracervical anesthesia reaches the nerve plexuses that lie adjacent to the cervix but not the nerves that accompany the ovarian vessels at the level of the uterine fundus. From Management of Unintended and Abnormal Pregnancy, NAF 2009



Depiction of paracervical (left) and intracervical (right) deep injections. From Management of Unintended and Abnormal Pregnancy NAF 2009

INJECTION TECHNIQUES

- Paracervical block is effective at reducing pain regardless of gestational age, although it can also be painful at the time of injection (Renner 2012).
- Injection locations and techniques vary by provider.
- Reported pain scores during dilation and aspiration are improved with buffered lidocaine and with deep injections (1.5 cm to 3 cm) (Renner 2010).
- Slower injection (60 vs. 30 sec) decreases pain, but waiting after injections to begin cervical dilation does not conclusively decrease pain.
- Four-site injections offer no benefit over two-site injections.
- Some use a forced cough technique during injection, although data are limited.
- Local anesthetics block nerve impulses, although physical pressure on nerves due to volume injected also provides analgesic effect. Saline (plain or bacteriostatic) has somewhat less effect than lidocaine (Chanrachakul 2001, Glanz 2001, Miller 1996).
- No evidence suggests one anesthetic is superior; alternatives include lidocaine, chloroprocaine (nesacaine), or bupivacaine (marcaine).

TIPS FOR MINIMIZING SYSTEMIC ABSORPTION

Maximum lidocaine dose recommended for pregnant women is 200 mg (achieved for example, by giving 20 cc of 1% lidocaine (10 mg/cc)).

At low concentrations, patients may have peri-oral tingling, dizziness, tinnitus, or metallic taste. At much higher concentrations, they can proceed to have muscular twitching, seizure, cardiac instability, unconsciousness, and even death (Paul 2009).

- Minimize direct intravascular injection and excessive anesthetic dosing.
- Use a combination of superficial (0.5") and deep injections (1.5").
- Move the needle while injecting (superficial to deep) OR aspirate before injecting.
- Use a lower lidocaine concentration.
- Use a vasoconstrictor mixed with the anesthetic to slow systemic absorption.

One Possible Mixture for Preparation of Anesthetic

1. Take 50 ml vial of 0.5% or 1% lidocaine and draw off 5 cc (save or discard).
2. Add 2-4 units (0.1-0.2 ml) of vasopressin.
3. Add 5 ml sodium bicarbonate (8.4%) as buffer.
4. About 20 ml of mixture is usually adequate.

Atropine may be added to above mixture for vasovagal prevention (recommended dose 2 mg / 50 ml).

UNIVERSAL PRECAUTIONS PERTAINING TO UTERINE ASPIRATION

Universal precautions are designed to prevent transmission of HIV, hepatitis B and other blood-borne pathogens when providing health care. Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious.

- Wear gloves and protective face gear when working with blood and body fluids, including mucous membranes, non-intact skin, and items soiled with blood or body fluids (i.e. bimanual exams, POC handling, speculums, and dilators).
- Avoid recapping contaminated needles unless there is no feasible alternative. Place sharps immediately in a puncture-resistant container for disposal.
- If there is a needle-stick or blood exposure, immediately tell your trainer or supervisor. More information is available through the National Clinicians' Post-Exposure Prophylaxis Hotline at (1-888-448-4911 or http://www.nccc.ucsf.edu/about_nccc/pepline), or OSHA at <http://www.osha.gov/SLTC/bloodbornepathogens/index.html>.

BASIC MEDICATION OPTIONS

Drug (Class)	Dose Range	Comment
Local Anesthesia and Additives		
Lidocaine (0.5% – 1%)	Up to 200 mg (20 cc 1% or 40 cc 0.5%)	Most common in U.S. Lower concentration as effective but more \$
Bacteriostatic Saline	20 cc	Somewhat less effective than lidocaine
Bicarbonate (Buffer)	5 cc / 50 cc anesthetic	Less injection pain
Vasopressin	5-10 u / 50 cc anesthetic	Decreases bleeding and systemic absorption
Atropine	2 mg / 50 cc anesthetic	Theoretically prevents vasovagal response
Oral and IV Pain Medications		
Ibuprofen	600 – 800 mg PO	More effective at least 30 minutes before procedure
Naproxen	250 – 500 mg PO	More effective at least 30 minutes before procedure
Vicodin / Tylenol 3	1-2 tablets PO	Equivalent medications can also be used
Lorazepam (Ativan)	0.5 – 1 mg SL or 1-2 mg PO	Shorter acting benzodiazepine. Antidote is Flumazenil
Diazepam (Valium)	5-10 mg PO	Longer acting benzodiazepine. Antidote is Flumazenil
Fentanyl	50 – 100 mcg IV	Give over 30-60 seconds. Antidote is Naloxone
Midazolam (Versed)	1 – 2 mg IV	Give over 2 minutes. Antidote is Flumazenil
Uterotonics for Post-Abortion Hemorrhage		
Methylergonovine (Methergine)	0.2 mg PO/IM or intracervically	Use with caution in hypertensive patients
Misoprostol	800-1000mcg PR or 800mcg SL	Sublingual dose has been used for postpartum hemorrhage
Carboprost (Hemabate)	0.25 mcg IM, may repeat at 15-90 minute intervals to max of 2mg	Use with caution in asthmatic patients
Oxytocin	10 u IM, or 10-40 u IV in crystalloid, or 10 units IVP	More uterine oxytocin receptors > 20 weeks
Emergency Medications		
Atropine Sulfate	0.2 mg (0.5 cc) IV push or 0.4 mg (1cc) IM, each 3-5 min to max dose of 2 mg	For prolonged symptomatic bradycardia
Benadryl	25 – 50 mg IM/IV/PO	For allergic reaction Can use oral if mild symptoms
Epinephrine (1:1000)	0.3 – 0.5 mg (1 mg/ cc) SQ/IM Repeat doses at 5-15 min intervals as necessary	For anaphylaxis. Preferable to inject in mid-anterolateral thigh
Naloxone (Narcan)	0.1 mg – 0.2 mg (0.25-0.50 cc) IV/ IM each 2-3 min Max dose 0.4 mg	Narcotic antidote
Flumazenil (Romazicon)	0.2 mg (2 cc) IV each min Max dose of 1 mg	Benzodiazepine antidote

MANAGING EMERGENCIES

MAINTAIN CLIENT SAFETY • CALL FOR HELP • ASSESS CLIENT CONDITION					
<ul style="list-style-type: none"> recent medication <ul style="list-style-type: none"> low pulse flushed/agitated coughing/sneezing <ul style="list-style-type: none"> SOB, hives 	<ul style="list-style-type: none"> high pulse cool, clammy skin <ul style="list-style-type: none"> low BP peri-oral cyanosis <ul style="list-style-type: none"> onset over minutes or hours 	<ul style="list-style-type: none"> low pulse <ul style="list-style-type: none"> low BP pale, sweaty nausea, vomiting <ul style="list-style-type: none"> may lose consciousness sudden onset 	<ul style="list-style-type: none"> no pulse absent respirations unconsciousness 	<ul style="list-style-type: none"> rhythmic limbs, jaw movements <ul style="list-style-type: none"> pulse >60 possible incontinence 	<ul style="list-style-type: none"> anxious rapid, shallow breathing normal pulse numbness carpal-pedal spasm
↓	↓	↓	↓	↓	↓
ANAPHYLAXIS	HYPOVOLEMIC SHOCK	VASOVAGAL REACTION (Neurogenic Shock)	CARDIO-PULMONARY ARREST	SEIZURE	HYPERVENTILATION
MODERATE - SEVERE (difficulty breathing): <ul style="list-style-type: none"> 50-100 mg Benadryl IM epinephrine (1:1000) 0.5 SQ or IV in 10cc solution, slow push <ul style="list-style-type: none"> oxygen call 911 	<ul style="list-style-type: none"> call 911 elevate legs light blanket oxygen Place large bore IV, start LR or NS, infuse rapidly 	<ul style="list-style-type: none"> elevate legs, cool cloth ammonia capsule oxygen 	<ul style="list-style-type: none"> call 911 start CPR 	<ul style="list-style-type: none"> prevent injury let seizure run its course oxygen 	<ul style="list-style-type: none"> reassure patient slow count breathing place paper bag over mouth to re-breathe CO2
↓	↓	↓	↓	↓	↓
If shock developing: <ul style="list-style-type: none"> start IV LR or NS 	<ul style="list-style-type: none"> continue IVF start 2nd IV line 	<ul style="list-style-type: none"> if continued symptomatic bradycardia, give Atropine 0.4mg IV or IM 		<ul style="list-style-type: none"> if continues >2min., call 911 give Diazepam (Valium) 5 mg IV or Midazolam 5-10 mg IM 	<ul style="list-style-type: none"> assure patient is stable before she leaves clinic
		↓		↓	
		<ul style="list-style-type: none"> if no recovery, call 911 		<ul style="list-style-type: none"> repeat x1 in 5 min. if needed 	

NOTE: Emergency Scenarios are available for medical staff role-plays, debrief, and teaching points for review at teachtraining.org/Resources.html.

EXERCISES: MEDICATIONS AND PAIN MANAGEMENT

EXERCISE 4.1

Purpose: To review management of side effects and complications from medications used to control pain and anxiety. How would you manage the following case scenarios of patients undergoing vacuum aspiration?

1. A patient states that last year she had an allergic reaction to the local anesthetic that her dentist used.

2. A patient chooses to have IV pain management due to extreme anxiety. You administer midazolam 1.5 mg and fentanyl 100 mcg. As you dilate the cervix, the patient falls asleep and is not easily arousable. Her oxygen saturation falls from 99% to 88%.

3. A patient who is 5 weeks LMP has a history of alcohol and heroin abuse, and she states that she “shot up yesterday.” She wants “all the pain medication she can get” for the abortion procedure. Venous access is limited, but you finally succeed in inserting an IV and administer midazolam 1 mg and fentanyl 100 mcg. You insert the speculum, and the patient complains that she “can feel everything” and “needs more meds.”

EXERCISE 4.2

Purpose: To become familiar with other medications used in abortion care.
Please answer the following questions.

1. At what gestational age range is it acceptable to administer mini-dose Rhogam (50 mcg) rather than full dose Rhogam (300 mcg) to the Rh-negative patient?
2. In which of the following situations is administration of Rh(D) immunoglobulin (Rhogam) suggested?
 - a. Patient has positive anti-D antibody titre.
 - b. Rh-negative patient received RhoGam 4 weeks ago during evaluation for threatened spontaneous abortion.
 - c. Rh-negative patient is 4 days post-abortion and did not receive RhoGam at the abortion visit.
3. While completing an early vacuum aspiration procedure using local cervical anesthesia only, the patient complains of nausea and “feeling faint.” She is pale and sweating. Her blood pressure is 90/50 and her pulse is 48. What is your differential diagnosis? How would you manage this patient?
4. After completing an uncomplicated vacuum aspiration abortion, the patient states that she forgot to mention that she is allergic to latex. In the recovery room, the patient develops urticaria, pruritis, and becomes acutely short of breath. What is your diagnosis? In addition to supplemental measures such as oxygen administration, what medications might you administer?

[Click here for the Teaching Points to these Exercises](#)

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