

## Manual Vacuum Aspiration (MVA) for Uterine Evacuation:

# Pain Management

*Reducing the physical pain and anxiety experienced by women undergoing uterine evacuation is an essential component of treatment with manual vacuum aspiration (MVA). This document addresses the types and origins of discomfort that women may experience during MVA, and several techniques that may be used to decrease discomfort.*

### What does MVA feel like?

Women's experience with pain during MVA varies widely; some women feel almost nothing at all and other women feel quite uncomfortable. Typically, the MVA procedure takes several minutes, during which most women feel a moderate amount of cramping, with the most intense cramping at the end as the procedure is completed. After the procedure has ended, cramping usually decreases rapidly. Women undergoing uterine evacuation with MVA appear to experience a level of discomfort that is similar to what women feel when undergoing an endometrial biopsy. Just as with an endometrial biopsy, approaches that enable women to remain awake and alert during the procedure will usually provide them with adequate pain relief.

MVA is a quiet technique for uterine evacuation, especially when compared to many electric vacuum aspiration (EVA) techniques. In several studies of uterine evacuations performed by MVA and EVA, women stated that they considered the absence of noise to be an advantage (Bird et al. 2001; Edelman et al. 2001). In a randomized trial of 114 women undergoing first-trimester abortion by either MVA or EVA, there was no significant difference in the numeric values women assigned to describe their pain. Yet when women were asked to qualitatively describe their discomfort, those who underwent EVA reported that the noise associated with the electric pump increased their pain (Edelman et al. 2001). Some clinicians who use MVA have commented that women ask for "the quiet procedure," indicating their preference for this aspect of MVA (Baird et al. 2001).

### What are the sources of pain during a uterine evacuation with MVA?

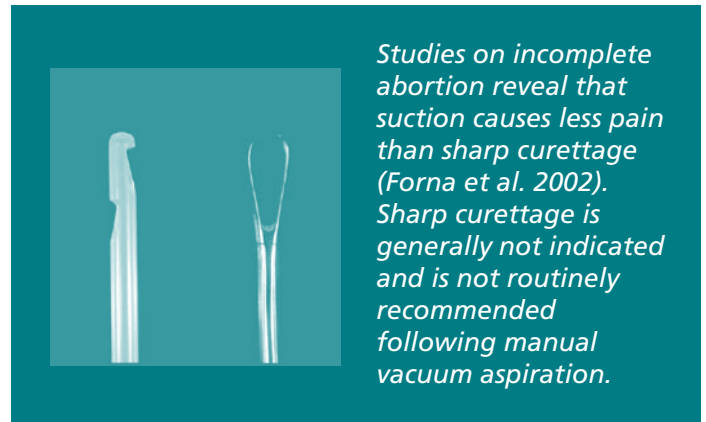
There are three distinct areas of discomfort during MVA:

**Anxiety:** Women often feel nervous about undergoing uterine evacuation, and their anxiety may aggravate their perception of pain. Conversely, women who feel less anxious are less likely to perceive pain (Wiebe et al. 1995; Stubblefield 1989).

**Cervical dilatation:** Cervical dilatation may be needed prior to MVA; passage of mechanical dilators through the cervix causes some discomfort.

**Uterine manipulation and evacuation:** Uterine instrumentation causes cramping that tends to increase when the uterus

contracts at the end of the evacuation. The whole procedure is usually quite brief, and any strong cramping that occurs generally lasts only a few minutes.



*Studies on incomplete abortion reveal that suction causes less pain than sharp curettage (Forna et al. 2002). Sharp curettage is generally not indicated and is not routinely recommended following manual vacuum aspiration.*

### What can be done to make MVA more comfortable?

The goal of pain management during uterine evacuation is to help women remain as comfortable as possible while minimizing medication-induced risks and side effects. A combination of patient education, verbal support, oral medications, paracervical block and gentle operative techniques provides effective pain relief for most women. Some women will prefer intravenous sedation or general anesthesia.

Ultimately, providing the woman with a full scope of pain management options so that she can choose a method that best fits her individual circumstances and wishes achieves the highest level of satisfaction.

### Specific Approaches to Pain Management

#### *Verbal Reassurance and Relaxation*

Often the woman is awake during MVA, and the clinician must be attentive to her comfort throughout the procedure. Because a woman's anxiety level strongly affects her perception of pain, respectful and supportive treatment by staff may reduce her anxiety and help her tolerate painful stimuli. Informing a woman of what she may feel during the procedure is one form of verbal support that eases anxiety. It is ideal for one team member to be at the woman's side during the procedure, continuously providing reassurance, information and support. For instance, a compassionate assistant who holds her hand or rubs her arm and provides verbal reassurance throughout the aspiration can decrease her level of anxiety and discomfort.

*“Providing psychological support to a woman undergoing an abortion procedure will significantly reduce client anxiety and discomfort.” (World Health Organization 1999).*

*Verbal reassurance does not mean telling the woman that the procedure is almost done if it isn't and does not include statements such as “you'll be fine.” Rather than downplaying a woman's fears, it is much more helpful to act in an empathetic manner by acknowledging and validating her feelings (Stewart et al. 2002). The woman should know that any pain she may feel should not last long (Hyman & Castleman 2005). Some women prefer to be distracted during the procedure. For example, staff members might engage her in conversation about family, work or hobbies. Other modalities, such as playing music or leading the woman through breathing exercises and guided imagery, can be tremendously helpful in reducing pain during the procedure.*

*A woman's level of comfort can be improved by the following:*

- *A procedure room that is quiet, relaxing and comfortable*
- *A clear explanation of what to expect before, during and after the procedure*

*Health-care staff who:*

- *are calm, friendly, empathetic, gentle and unhurried but efficient*
- *are attentive to the woman, listen to her and make her needs their first priority*
- *are respectful of the woman's privacy and confidentiality*

## Medications

There are three categories of medications used for pain management:

**Analgesics** alleviate the sensation of pain in the receptors of the spinal cord and brain (Margolis et al. 1993).

**Anesthetics** eliminate the physical sensation of pain. Locally infiltrated anesthesia, such as lidocaine, is injected into the cervix and areas around the cervix. This blocks the sodium pump, interrupting the transmission of painful impulses to the brain. In North America, local anesthesia with or without IV sedation is the most common kind of anesthetic used in uterine evacuation (Maltzer et al. 1999).

**Anxiolytics** decrease anxiety and facilitate relaxation. This class of drugs can also cause amnesia and depression of the central nervous system. Oral anxiolytics have not been shown

to decrease the actual pain of uterine aspiration for pregnancy termination and therefore are not a substitute for other forms of pain management (Rawling et al. 1998).

Prior to giving medication, the clinician must evaluate the woman's surgical and anesthetic risk, as well as her emotional state and preferences for pain control, as these may influence which treatments are offered to manage pain. The preoperative evaluation should include an assessment of the woman's anxiety level, as well as her general health history. If intravenous medications are planned, the woman's risk for gastrointestinal reflux and aspiration should also be assessed. The clinician should be aware of the following, regarding any pain medication: the time the medicine is given; the medication's onset of action, peak and duration of effect; and the medication-induced side effects and complications and how to manage them. Dosages must be timed so that the medication is in full effect when the procedure starts.

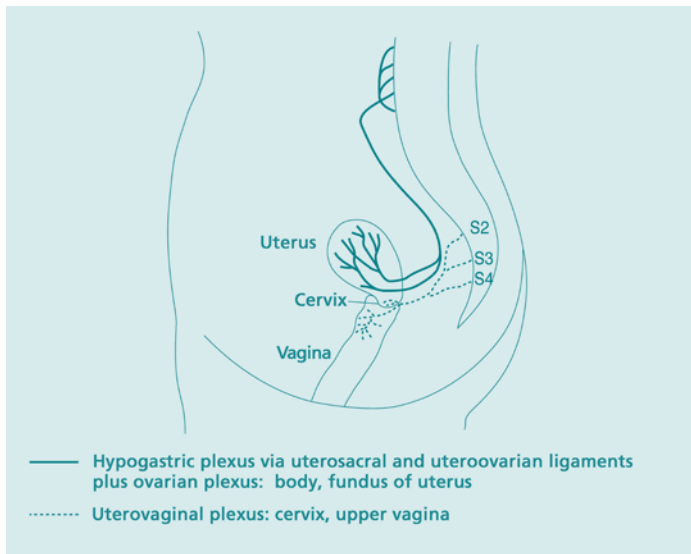
## Methods for Administering Medications

Although several methods for administering pain-management medications are discussed in this section, local anesthesia via paracervical block will receive the most attention. Paracervical block is frequently used in combination with other types of medication during MVA procedures in North America, and clinicians regularly request clinical information on administering this method of pain control. The detailed information on paracervical block that is presented below is intended to answer clinicians' commonly asked questions.

*In a survey of 310 member clinics of the National Abortion Federation, paracervical block with or without oral pre-medication was the most common approach to pain control for first-trimester surgical abortion; 58 percent of respondents use this approach (Lichtenberg et al. 2001). Thirty-two percent of respondents use local anesthesia with intravenous sedation and 10 percent use general anesthesia. Non-pharmacologic approaches were used frequently, including focused breathing (76 percent), visualization (31 percent) and massage (14 percent).*

## Local Anesthesia (Paracervical Block) Plus Oral Analgesics

The cervix and lower uterine segment are innervated by parasympathetic nerve fibers S2 through S4 (Maltzer et al. 1999). Local anesthesia, via paracervical block, injected into the cervix targets these nerves and is effective in reducing pain caused by cervical dilatation and movement. Additionally, using a prostaglandin such as misoprostol or an osmotic dilator such as laminaria for cervical preparation may facilitate dilatation but it is unknown how these may influence patient pain (Okanloma et al. 1999; Grimes et al. 1984).



The uterine fundus is innervated by the sympathetic nerves T10 through L1. These nerves follow along the ovarian plexus and uterosacral and uteroovarian ligaments, and are not fully accessible by the paracervical block since they accompany the ovarian vessels and are higher in the pelvis than local infiltration will reach (Maltzer et al. 1999; Margolis et al. 1993). Instead, non-steroidal anti-inflammatory agents (NSAIDs) which reduce the formation of prostaglandins that mediate uterine pain may reduce this type of discomfort. NSAIDs, such as ibuprofen 800 mg or naproxen 550 mg, given by mouth 30-60 minutes prior to the procedure are recommended to decrease pain of uterine cramping (Wiebe et al. 1995). NSAIDs may be combined with narcotics to produce an additive analgesic effect; this enables lower narcotic doses to be used (Abramowicz 1993).

*In a Swedish study of 200 women undergoing uterine evacuation prior to eight weeks since the last menstrual period (LMP), women were given free choice as to whether they would receive general anesthesia or paracervical block (Hemlin et al. 2001). All uterine evacuations were done in the operating room. Of the 37 women who underwent MVA with paracervical block, none requested conversion to general anesthesia. Therefore, even when it was made very easy for patients to request pain medication stronger than paracervical block, no woman in this study felt she needed to do so.*

*Based on anecdotal evidence provided by clinicians, the following variations in technique have reportedly been helpful in administering paracervical block:*

- *23-gauge 1.5 inch needle works well to perform the paracervical block;*
- *Mixing bicarbonate with the lidocaine (in approximately a 1:10 ratio by volume of bicarbonate to lidocaine) decreases the acidity of the lidocaine, which speeds the numbing effect and may alleviate stinging caused by the lidocaine injection;*
- *Initially, make injections superficially in a ring-like fashion around the cervix directly under the mucosa (Stubblefield, 1989). Then place subsequent deeper injections through the anesthetized area. Advance a 1.5 inch needle all the way into the tissue, aspirate and inject anesthetic on the way out. (This technique of numbing the site before delivering deeper injections is a variation on the technique that is described in the steps below.)*

#### *Steps for administering paracervical block*

1. Complications from local anesthesia are extremely rare but include such effects as disorientation and seizures, primarily due to unintentional intravascular injection. To minimize risks, use the lowest anesthetic dose possible, usually 10-20 mL of a 0.5-1 % lidocaine solution. In a study of 209 women undergoing first-trimester abortions, equivalent pain relief was obtained by 20 mL of both 0.5% and 1.0% lidocaine; therefore a dosage of 0.5% is recommended (Wiebe et al. 1996).

*After inserting the needle but before any injection of local anesthetic, always aspirate by drawing the plunger back slightly to make certain the needle is not penetrating a blood vessel. If any blood is visible in the syringe, do not inject; instead, move to a different injection site. Aspirate again before injecting.*

2. Inject 1-2 mL of anesthetic at the site where the tenaculum will be placed (usually 6 or 12 o'clock).
3. Next, place the tenaculum at the anesthetized site. Use slight traction to move the cervix and define the transition of smooth cervical epithelium to vaginal tissue. This reflection marks the site of further injections around the cervix. Compared to cervical tissue, vaginal mucosa is more elastic and appears folded.
4. Inject 2-5mL of lidocaine into each injection site at 4 and 8 o'clock. Other clinicians choose to inject at 3, 5, 7 and

9 o'clock. In addition, some clinicians inject at 11 and 1 o'clock. Inject slowly to decrease pain of injection (Wiebe et al. 1995).

5. Inject to a depth of 1-1.5 inches. Deeper injections (1.0-1.5 inches) have been found to be more effective than superficial injections (Wiebe 1992).

(Adapted from Maltzer et al. 1999; Margolis et al. 1993; Wiebe 1992; Stubblefield 1989)

### *Conscious Sedation*

When conscious sedation is performed, anxiolytics and analgesics are given intravenously. During the procedure the woman should still be able to communicate, respond to instructions and maintain her reflexes. This approach depresses consciousness, so the patient must be monitored closely while the medications are in effect. The most valuable monitor is a trained staff member observing the woman and speaking to her. Many clinics also use a transcutaneous oximeter to continuously assess oxygenation and heart rate.

Both anxiolytics and narcotics may cause respiratory depression, especially when they are used together. With higher medication doses, the patient may lose her ability to protect her airway. Even clinicians using lighter sedation analgesia must be able to manage respiratory arrest, in the unlikely event that an unintentional overdose should occur. Providers should be trained in cardiopulmonary resuscitation, and resuscitative equipment and appropriate antagonist drugs (naloxone and flumazenil) must be available. If the woman receives narcotics or anxiolytics, she should not drive a car until she has had time to completely eliminate the medications from her body.

In a randomized, controlled trial comparing intravenous fentanyl to placebo for pain control, 825 women undergoing first-trimester abortion were asked to rate their pain on an 11-point scale. Women who received fentanyl rated their pain one point lower than those treated with placebo, revealing a statistically significant difference. Yet in the women's opinion, at least a two-point pain reduction was required to noticeably reduce the discomfort they experienced during the procedure (Rawling et al. 2001). In a comparative study of 330 women undergoing first-trimester abortion with paracervical block, women who also received intravenous fentanyl and midazolam reported slightly lower pain scores than those who received either sublingual lorazepam or only paracervical block (Allen et al. 2006).

### *Heavy Sedation/General Anesthesia*

Some women, especially those who are particularly anxious, may prefer heavy sedation or general anesthesia. The benefits of general anesthesia include complete pain control, an improved surgical field, possibly shorter procedure time, and depending on which agent is used, possibly less nausea when compared to intravenous sedation. General anesthesia has risks which include depression of the woman's reflexes and reduced airway protection. General anesthesia requires the presence of an anesthesia provider and facilities that enable close monitoring of the patient during the procedure and recovery. Using heavy sedation or general anesthesia is likely to increase the cost of the procedure and possibly the recovery time, depending on the agents used.

If general anesthesia is administered, providers should be aware that some inhalation anesthetics relax the uterus and increase bleeding, and therefore should not be used for uterine evacuation. These agents include halothane and isoflurane. As with narcotics and anxiolytics, a woman who has undergone general anesthesia should not drive a car until she has had time to completely eliminate the medications from her body.

### *Postoperative Pain Control*

MVA-induced cramping diminishes quickly after the procedure. Within 30-60 minutes, women usually describe their pain as mild discomfort. After discharge, women should take an oral NSAID such as 800 mg of ibuprofen three times a day or as needed for pain.

## *Clinical Recommendations*

*Most women undergoing MVA in the first trimester will obtain adequate pain relief with a combination of the following approaches:*

- *A respectful, informative and supportive staff*
- *A warm and friendly environment*
- *An effective paracervical block*
- *Non-steroidal anti-inflammatory agents*
- *Gentle operative technique*
- *Additional pain medications may be appropriate on an individualized basis*

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## Table: Pharmacologic Approaches to Pain Management during MVA

Though the agents listed below are commonly used for pain management during uterine evacuation, many other options exist. This table does not cover general anesthetic agents.

Type of Drug	Drug Name (Generic)	Usual Dose and Timing	Half-Life	Side Effects	Comments
Local Anesthetic	Lidocaine (Xylocaine)	15-20 mL of 0.5-1% solution in paracervical block. Not to exceed 4 mg/kg (a)	60-90 minutes	Buzzing in ears, dizziness, numbness of lips, mouth and tongue, metallic taste, seizures	Aspirate before injecting to avoid vascular administration. Mild reaction (itching, rash, hives): treat with 25-50 mg diphenhydramine (Benadryl) IM or IV.  Intense reaction or respiratory distress: obtain IV access immediately. Treat with epinephrine 0.4 mg subcutaneously and diazepam 5 mg IV (pushed slowly), and support respiration with oxygen and a ventilating bag. If wheezing is present, an inhaler may be useful.  Allergic reaction is very rare. Reactions that do occur are most likely due to methylparaben preservative in multidose vials. Preservative-free lidocaine allergy is extremely rare.
Analgesic/NSAID	(ibuprofen) or (naproxen)	PO: 400-800 mg PO: 550 mg 1 hour before procedure	4-6 hours	Possible gastro-intestinal upset	Do not use in women with active peptic ulcer disease or renal failure. Allergic reaction may occur in patients with nasal polyps, asthma or sensitivity to NSAIDs.
Analgesic/ NSAID	Toradol (ketorolac)	PO: 20 mg 1 hour before procedure (10 mg for women weighing less than 50 kg) IV: 30 mg over at least 15 seconds (15 mg for women weighing less than 50 kg) IM: 60 mg (30 mg for women weighing less than 50 kg) Give both IM and IV toradol 30-60 minutes prior to procedure	4-6 hours		Probably as potent as morphine for pain relief (Maslanka et al. 1994).  Do not use in women with active peptic ulcer disease or renal failure, or who are breastfeeding. Bronchospasm or other allergic reaction may occur in patients with nasal polyps, asthma or sensitivity to NSAIDs.  Breakthrough pain should be managed with narcotics rather than increasing the Toradol beyond recommended doses.
Analgesic	Tylenol (acetaminophen)	PO: 500-1000 mg 30-60 minutes before procedure	4-6 hours		Liver toxicity from overdose. Do not use in the presence of renal compromise.
Narcotic combination	Tylenol with codeine (300 mg acetaminophen with 30 mg codeine)	PO: 1-2 tablets 1 hour prior to procedure	3-6 hours	Drowsiness, light-headedness, weakness	Liver and kidney toxicity especially in the presence of pre-existing disease.
Analgesic/Narcotic	Vicodin (500 mg acetaminophen with 5 mg hydrocodone)	PO: 1-2 tablets 1 hour prior to procedure	4-6 hours	Drowsiness, light-headedness, weakness, nausea and vomiting, CNS and respiratory depression	If respiration is compromised: assist with breathing (oxygen, Ambu bag) and reverse with naloxone (b).
Analgesic/ Narcotic	Demerol (meperidine)	IV: 25-50 mg 5-15 minutes prior to procedure IM: 50-125 mg 15 -30 minutes prior to procedure PO: 100-150 mg 30-60 minutes prior to procedure(c)	4-6 hours	Drowsiness, light-headedness, weakness, nausea and vomiting, CNS and respiratory depression, hypotension, seizures	If respiration is compromised: assist with breathing (oxygen, Ambu bag) and reverse with naloxone (b).  After IM injection, time to peak plasma levels can vary 3-5 fold between patients.

Type of Drug	Drug Name (Generic)	Usual Dose and Timing	Half-Life	Side Effects	Comments
Analgesic/Narcotic	Sublimaze (fentanyl)	IV: 50-100 mcg 5-15 minutes prior to procedure (may repeat every 10-15 minutes, not to exceed 250 mcg) (c)	30-60 minutes	Drowsiness, light-headedness, weakness, bradycardia, CNS and respiratory depression	If respiration is compromised: assist with breathing (oxygen, Ambu bag) and reverse with naloxone (b). 100 mcg fentanyl =10 mg of morphine. Onset of action: 2-7 minutes when given IV.
Anxiolytic/Amnestic	Valium (diazepam)	IV: 2-5 mg IV (c) 20 minutes prior to procedure PO: 10 mg 1 hour prior to procedure	21-37 hours	Blurred vision, dizziness, disorientation, pain and redness on injection	If respiration is compromised: assist with breathing (oxygen, Ambu bag) and reverse with flumazenil (d). Has a mild amnestic effect. Occasionally, it may increase the patient's anxiety. Onset of action: 2-10 minutes when given IV.
Anxiolytic/Amnestic	Versed (midazolam)	IV: 1-2 mg initially, then 0.5-1.0 mg IV every 5 minutes as needed, not to exceed 5 mg IM: 0.07-0.08 mg/kg or about 5 mg (using 5mg/mL dilution) (c)	1-4 hours	Blurred vision, dizziness, disorientation (significantly less pain on injection than diazepam due to water solubility of midazolam)	If respiration is compromised: assist with breathing (oxygen, Ambu bag), and reverse with flumazenil (d). 2.5 mg midazolam = 10 mg diazepam. Stronger amnestic effect than diazepam. Onset of action: 1-5 minutes when given IV; 15-30 minutes when given IM.
Anxiolytic/Amnestic	Ativan (lorazepam)	IV: 2 mg given over 1 minute IM: 0.05 mg/kg up to a maximum of 4 mg at least 2 hours before procedure PO: 1-2 mg 30-60 minutes prior to procedure		Blurred vision, dizziness, disorientation, CNS and respiratory depression	If respiration is compromised: assist with breathing (oxygen, Ambu bag), and reverse with flumazenil (d). Has a mild amnestic effect. Occasionally, it may increase the patient's anxiety.

a) 1% lidocaine means there is 10 mg/mL, and 20 mL contains 200 mg. Using 0.5% lidocaine (5 mg/mL) results in half the total dosage of a 1% solution. The maximum dosage should not exceed 4 mg/kg of lidocaine.

b) Naloxone treats narcotic overdose (usually characterized by respiratory depression). Generally one vial of naloxone contains 0.4 mg. Before using, mix one vial with 10 mL saline, yielding 40 mcg/mL. Then, give 1 mL IV at a time and wait about two minutes to take effect. Naloxone's duration of action is one hour and may wear off before the narcotic; therefore, patients treated with naloxone must be monitored closely for at least several hours.

c) All narcotic and anxiolytic drugs given intravenously immediately before or during the procedure should be administered slowly and intermittently by a specially trained health care provider. Their effects, while rapid in onset, are not instantaneous. Side effects are most likely when they are used in combination. Using narcotics and anxiolytics together increases the risk of respiratory depression; accordingly, lower doses should be used than when these agents are given separately. Problematic side effects can be avoided by repeated small doses of these potent medications (Margolis et al., 1993; Baird et al., 2002). These medications should be administered prior to the procedure so they are at their peak effect during the procedure, at the point where the woman is experiencing the most discomfort. If peak effect occurs after the procedure has ended, the patient is put at higher risk for excessive sedation.

d) Flumazenil treats benzodiazepine overdose (usually characterized by somnolence). Use 0.2 mg IV every minute until respirations return. Do not exceed 1 mg. Its duration of action is one hour and it may wear off before the benzodiazepine; therefore, patients treated with flumazenil must be monitored closely for as long as the benzodiazepine may still be in their system. In the event of overdose when given in combination with narcotics, some experts recommend reversing the narcotic first with naloxone, and using flumazenil subsequently if available and needed.



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