

# Mara™

## Instructions For Use Mara™ Water Vapor Ablation System

Model # GEN-16-050 Mara Console

DDK-16-050 Mara Water Vapor Probe Kit



Mara Console and Water Vapor Probe

# CooperSurgical®



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**CAUTION:** FEDERAL LAW RESTRICTS THIS DEVICE TO SALE BY OR ON THE ORDER OF A PHYSICIAN TRAINED IN THE USE OF THE MARA WATER VAPOR SYSTEM.

Read all instructions, cautions and warnings prior to use.

Failure to follow any instructions or to heed any warnings or precautions could result in serious patient injury.

The Mara Water Vapor Probe and Mara Console must be used only in conjunction with each other. Both are to be used only by physicians who have reviewed and understand the Mara Water Vapor Ablation System labeling and training materials.

The Mara Water Vapor Probe is not made from natural rubber latex.

Prior to using the Mara Water Vapor Ablation System, carefully read the entire Instructions for Use as well as the Mara Console Operator's Manual to obtain information about the proper procedures for inspecting, preparing and operating the Mara Console.

Contact CooperSurgical, Inc. with any questions about the information contained in the Instructions for Use or in the Mara Console Operator's Manual.

## 1.0 SYSTEM DESCRIPTION

The Mara Water Vapor Ablation System consists of:

1. A reusable Mara Console with attached Cartridge, Cartridge Cable and AC power cord
2. The single use Mara Water Vapor Probe Kit that includes a sterile Mara Water Vapor Probe with attached saline delivery conduit, syringe and saline supply line with spiked end



**Mara Console and Water Vapor Probe**

The single use Mara Water Vapor Probe has been designed with SmartSeal™ technology to optimize device placement and to protect the cervix and vagina from thermal effects. The soft slender tip of the Water Vapor Probe is inserted transcervically into the uterine cavity. The Water Vapor Probe delivers water vapor to ablate the endometrial lining of the uterus. The water vapor is created within the Water Vapor Probe from saline, using energy provided by the Console.

The Mara Water Vapor Ablation System has been designed with the IntegrityPro™ safety feature which utilizes SmartSeal technology designed to ensure

that the Water Vapor Probe tip is correctly placed in the uterine cavity and that there are no leaks from the uterine cavity or cervix through which water vapor could escape. The IntegrityPro safety feature is comprised of a Uterine Cavity Integrity Test and a Device Lumen Patency Test. Both tests are performed with normal saline (0.9% NaCl) after placement of the Water Vapor Probe and prior to water vapor delivery. The Uterine Cavity Integrity Test is designed to assess for leaks in the uterus or through the cervical canal through which water vapor could escape. The Device Lumen Patency Test is performed directly following a successful Uterine Cavity Integrity Test. The Device Lumen Patency Test is designed to confirm the Water Vapor Probe tip is positioned appropriately and that the Water Vapor Probe delivery lumen is not blocked by blood or tissue that could have impacted the saline flow rate and results of the Integrity Test. Water vapor delivery is initiated only after both tests pass consecutively.

Water vapor is delivered to the uterus for 140 seconds, with a treatment time of 120 seconds. The first 20 seconds of water vapor delivery serve to displace saline remaining in the uterus and device lines after the Device Lumen Patency Test. These 20 seconds are referred to as the “saline flush.” Intrauterine water vapor pressure is regulated by the Mara Console, based on feedback from a pressure sensor near the distal tip of the Water Vapor Probe. The patient’s uterus will be exposed to a temperature of 101°C (nominal) during water vapor delivery.

During treatment, SmartSeal provides automated real-time monitoring of sealing balloon pressure, uterine pressure and cervical temperature, with active management of uterine and cervical seal designed to ensure that water vapor delivery is confined to the uterine cavity or terminated if a leak is detected.

## 2.0 INDICATION FOR USE

The Mara Water Vapor Ablation System is indicated to ablate the endometrial lining of the uterus in premenopausal women with menorrhagia (excessive uterine bleeding) due to benign causes for whom childbearing is complete.

## 3.0 CONTRAINDICATIONS

The Mara Water Vapor Ablation System is contraindicated for use in:

- A patient who is pregnant or who wants to become pregnant in the future.

**PREGNANCIES FOLLOWING ABLATION CAN BE DANGEROUS FOR BOTH MOTHER AND FETUS.**

- A patient with known or suspected uterine cancer or pre-malignant conditions of the endometrium, such as unresolved adenomatous hyperplasia.
- A patient with endometrial hyperplasia as confirmed by histology.

- A patient with any anatomic condition (e.g., history of previous classical cesarean section or transmural myomectomy, including hysteroscopic and/or laparoscopic myomectomy performed immediately prior to the Mara Water Vapor Ablation Treatment).
- A patient currently on medications that could thin the myometrial muscle, such as long-term steroid use (except for inhaler or nasal therapy for asthma).
- A patient with a uterine length < 6cm (external cervical ostium to internal fundus).
- A patient with a history of a prior completed endometrial ablation procedure and/or endometrial resection (including endometrial ablation/resection performed immediately prior to the Mara Water Vapor Ablation Treatment) regardless of the modality by which it was performed.

**REPEAT ABLATION MAY RESULT IN SERIOUS PATIENT INJURY.**

- A patient with active genital or urinary tract infection (e.g., cervicitis, vaginitis, endometritis, salpingitis or cystitis) at the time of treatment.
- A patient with bacteremia, sepsis or systemic infection.
- A patient with an intrauterine device (IUD) currently in place.
- A patient with active pelvic inflammatory disease or known or suspected hydrosalpinx based on history or ultrasound at screening.
- A patient with undiagnosed vaginal bleeding.



## 4.0 WARNINGS

**READ ALL INSTRUCTIONS CAREFULLY. FAILURE TO PROPERLY FOLLOW THE INSTRUCTIONS, WARNINGS, AND PRECAUTIONS MAY LEAD TO PATIENT INJURY.**

**DO NOT perform the Mara Water Vapor Ablation treatment concomitantly with Essure® placement or prior to a satisfactory Essure Confirmation Test. Ablation can cause intrauterine synechiae which can compromise (i.e., prevent the proper interpretation of) the modified hysteroscopy, which may be required for the Essure Confirmation Test.**

### **Uterine perforation**

- Uterine perforation can occur during any procedure in which the uterus is instrumented. Use caution not to perforate the uterine wall when sounding, performing any hysteroscopic visualization of the uterus or dilatation of the endocervical canal if required, or inserting the Water Vapor Probe.
- The following indicates possible uterine perforation:
  - If the Water Vapor Probe can be inserted to a greater depth than was determined by the uterine sound device, and the setting of the Water Vapor Probe Slide Collar Adjustment Knob.
  - If the Console automatically terminates water vapor delivery due to a drop in water vapor pressure.

- Multiple failures of the Uterine Cavity Integrity Test may be indicative of a possible uterine perforation or leak from the uterine cavity or a leak somewhere in the Mara Water Vapor Ablation System. Although water vapor cannot be delivered without passing the pre-procedure tests, proceed with caution as perforation may be present even if no leaks can be determined.
- If a possible uterine perforation is suspected, the procedure should be terminated immediately.
- If the procedure is terminated due to a suspected uterine perforation, the patient should be evaluated for possible uterine perforation prior to discharge.
- If a perforation is present, and the procedure is not terminated, thermal injury to adjacent tissue may occur if water vapor is being delivered.
- Although designed to detect a possible perforation of the uterine wall, the integrity test is an indicator only and it might not detect all possible perforations. Clinical judgment must always be used.
- **Post-treatment, any patient-reported signs/symptoms that could indicate a serious complication, e.g., bowel injury, should be thoroughly evaluated without delay.**

## 5.0 GENERAL WARNINGS

- ⚠ Endometrial ablation using the Mara Water Vapor Ablation System is not a sterilization procedure. Therefore, the patient should be advised of appropriate birth control methods.
- ⚠ Pregnancy is not likely after ablation, but it can happen. If it does, the risk of miscarriage and other problems are greatly increased. If a woman still wants to become pregnant, she should not have this procedure. Women who have endometrial ablation should use birth control until after menopause.<sup>1</sup>
- ⚠ Endometrial ablation does not eliminate the potential for endometrial hyperplasia or cancer of the endometrium and may mask the physician's ability to detect or make a diagnosis of such pathology.
- ⚠ Patients who undergo endometrial ablation procedures who have previously undergone tubal ligation may be at increased risk of developing post ablation tubal sterilization syndrome, which can require hysterectomy. This can occur as late as 10 years post-procedure.
- ⚠ Aseptic technique — Use aseptic technique in all patient procedures.

<sup>1</sup> <http://www.acog.org/Patients/FAQs/Endometrial-Ablation>

## 6.0 TECHNICAL WARNINGS

### **FAILURE TO FOLLOW ANY INSTRUCTIONS OR FAILURE TO HEED ANY WARNINGS OR CAUTIONS COULD RESULT IN SERIOUS PATIENT INJURY.**

- ⚠ Sterile. The Mara Water Vapor Probe has been sterilized with ethylene oxide (EO) gas, for one single-patient use only.
- ⚠ Do not use the Mara Water Vapor Probe if the packaging appears to be damaged or there is evidence of tampering.
- ⚠ Earth grounding reliability of the Console is only achieved when equipment is connected to a receptacle designated "Hospital Grade." Hospital grade receptacles may be marked with a green dot, or wording such as "Hospital Grade" or "Hosp. Grade." Consult your institution's biomedical department if unsure.
- ⚠ Risk of Infection or disease – Dispose of used device and waste products per standard institutional practices for biohazard waste.
- ⚠ For single use only. Do not reuse, reprocess or re-sterilize the Water Vapor Probe. Reuse, reprocessing or re-sterilization may compromise the structural integrity of the Mara Water Vapor Probe and/or lead to failure of the Mara Water Vapor Probe, which in turn may result in patient injury, illness or death. Reuse, reprocessing or re-sterilization may

also create a risk of contamination of the Mara Water Vapor Probe and/or cause patient infection or cross-infection, including but not limited to, the transmission of infectious disease(s) from one patient to another. Contamination of the Mara Water Vapor Probe may lead to injury, illness or death of the patient.

- ⚠ The used Mara Water Vapor Probe must be treated as biohazardous waste and disposed of in accordance with hospital or clinic standard practice where the treatment is performed.
- ⚠ The Mara Water Vapor Probe must be used only in conjunction with the Mara Console and is not to be used with other equipment.
- ⚠ The Mara Console is not to be used with other devices.
- ⚠ Do not place the outflow tubing over the patient's leg or in contact with any other part of the patient or user. Place outlet end of the Water Vapor Probe's outflow line in the waste collection container (not provided) that is intended to collect water vapor outflow. Be sure the distal tip of the Outflow Tube remains in the waste collection container for the remainder of the procedure. The Outflow Tube carries water condensate and water vapor and could cause thermal injury. The perforated end section of the outflow tubing discharges water condensate and water vapor. Do not place the outlet end of the

water vapor outflow line into the upper portion of an under-buttock drape due to the risk of severe burn to the patient. Ensure that the outlet end of the water vapor outflow line is not submerged in fluid at any time during the procedure.

- ⚠ Care must be taken when removing the Protective Tip Cover from the Water Vapor Probe. The Protective Tip Cover will contain water condensate that is hot and could cause thermal injury to the patient or user, if it were to spill.
- ⚠ The physician must maintain control of the Water Vapor Probe (i.e., not hand off to another individual) for the duration of the water vapor treatment to avoid compromising the cervical seal or device position. A compromise of cervical seal could result in water vapor leakage and pressure loss, which could result in patient injury or early termination of water vapor delivery.
- ⚠ A Mara Water Vapor Ablation treatment cannot be performed without the successful completion of the Device Lumen Patency Test, after the successful completion of the Uterine Cavity Integrity Test. If the Device Lumen Patency Test indicates an obstructed Water Vapor Probe tip or lumen and the source of the obstruction cannot be identified and corrected, delivery of water vapor cannot be initiated.

- ⚠ If clogging of the Water Vapor Probe by bleeding or debris is deemed the reason for a failed Device Lumen Patency Test, the ablation procedure may be terminated and rescheduled. Alternately, if there is suspicion that the Water Vapor Probe tip is positioned in tissue, the Water Vapor Probe should be removed and repositioned upon insertion. Follow the on-screen prompts to deflate the Water Vapor Probe balloons before removal and prior to insertion.
- ⚠ Use caution not to pinch or manipulate any tubing (i.e., Outflow Tube, Saline Supply Line) while performing endometrial ablation with the Mara Water Vapor Ablation System.
- ⚠ After completion of the Uterine Cavity Integrity Test and prior to the delivery of water vapor treatment, if there is any suspicion that the Water Vapor Probe is no longer properly positioned, or if the Tenaculum Stabilizer was not properly placed, the Water Vapor Probe balloons should be deflated and the procedure should be re-started.
- ⚠ Once water vapor delivery has been initiated, maintain the position of the tenaculum relative to the Water Vapor Probe using the Tenaculum Stabilizer. Do not remove the Water Vapor Probe until the treatment has been completed as confirmed by the display screen on the Console.

- ⚠ In the event of loss of power during water vapor delivery, Water Vapor Probe balloon inflation will be maintained. Wait 15 seconds for water vapor to dissipate from the uterus through the outflow tubing. Disconnect the Cartridge from the Water Vapor Probe Handle to allow the Water Vapor Probe balloons to deflate, and carefully remove the Water Vapor Probe from the uterus.
- ⚠ Inspect Console components regularly for damage, and do not use them if damage is apparent.
- ⚠ For additional warnings regarding the Console, please read the Operator's Manual for Mara Console.

## 7.0 PRECAUTIONS

- ⚠ The structure of the endometrial cavity and uterine wall should be thoroughly evaluated to ensure suitability for thermal endometrial ablation. The use of transvaginal ultrasonography, saline infusion sonohysterography, hysteroscopy, or a combination of these procedures should be performed to evaluate the uterine architecture for structural anomalies. These various imaging modalities can also be used to identify the position of an obvious and visible structural anomaly from prior transmural uterine surgery such as a Cesarean scar defect to confirm that it does not present with thin myometrium located within the uterine



cavity where thermal endometrial ablation will be performed. If a structural anomaly is found within the uterine cavity, then best clinical judgment should be used before performing thermal endometrial ablation.

- ⚠ The Mara Water Vapor Ablation treatment is intended to be performed only once during a single operative visit. A repeat endometrial ablation in the same operative setting with the Mara Water Vapor Ablation System has not been studied and the effects are unknown.
- ⚠ It has been reported in the literature<sup>2</sup> that patients with a severely anteverted, retroflexed or laterally displaced uterus are at greater risk of uterine wall perforation during any intrauterine manipulation.
- ⚠ A false passage can occur during any procedure in which the uterus is instrumented, especially in cases of severely anteverted, retroflexed or laterally displaced uteri. Use caution to ensure that the device is properly positioned in the uterine cavity.
- ⚠ To ensure proper operation, never use other products or components not identified in these instructions with the Mara Water Vapor Ablation System.

<sup>2</sup> Kho KA, Chamsy DJ. Perforated Intraperitoneal Intrauterine Contraceptive Devices: Diagnosis, Management and Clinical Outcomes. J Minim Invasiv Gynecol Jul/Aug 2014 21(4): p596-601.

- ⚠ Exercise care when handling liquids around electrical equipment. If either a large amount of water has been spilled, or it is suspected that water may have infiltrated the Console, do not attempt to operate the Console.
- ⚠ Patients who have undergone endometrial ablation and who are later placed on hormone replacement therapy should have progestin included in their regimen in order to avoid the increased risk of endometrial adenocarcinoma associated with unopposed estrogen replacement therapy irrespective of whether total amenorrhea has been achieved after ablation treatment.
- ⚠ The safety and effectiveness of the Mara System has not been fully evaluated in patients with: a uterine sound measurement > 12 cm, submucosal fibroids that obstruct the uterine cavity, bicornuate uteri, known uterine septum >1/3 cavity length, suspected adenomyosis.
- ⚠ Patients must be informed of the risks and possible adverse events associated with endometrial ablation and use of the Mara Water Vapor Ablation System.
- ⚠ For additional precautions for the Console, please read the Operator's Manual for Mara Console.

## 8.0 ADVERSE EVENTS

A total of 221 patients were treated with the device. The following device and procedure-related adverse events have been reported with use of the Mara Water Vapor Ablation System and are presented in tabular form for each of 2 cohorts.

The most common procedure-related complications for the Pivotal subjects within 1 year include:

- Uterine cramping (40%)
- Nausea (6.5%)
- Vomiting (3.2%)
- Vaginal infection (2.6%)
- Abdominal pain (2.6%)
- Abdominal Distention (1.9%)
- Endometritis (1.3%)

Other events were limited to single occurrences (0.6%)

## Safety and Pivotal Subjects

Sixty-six (66) patients were treated and followed for their safety results for three (3) to six (6) months only. This is called the “Safety Study.” The next 155 patients were treated and followed for one year to assess the safety and effectiveness of the Mara Water Vapor Ablation System. This study is called the “Pivotal Study.” Patients in the pivotal study were followed for an additional two to three years to collect longer term outcomes. This portion of the study is called the “Post Approval Study.”

### Pivotal Subjects – Adverse Events

**Table 1** on the right shows the number and percentage of Pivotal subjects who reported device or procedure-related adverse events, one or more times, during the 12-month follow-up period. **There were no reported serious adverse device effects (SADEs), nor any reported SAEs, that were procedure related.**

It should be noted that the onset of uterine cramping decreased from 34.2% on the day of ablation to 1.9% the day after ablation. The severity of cramping was reported as mild to moderate in 97% of subjects. Uterine cramping is a known side effect of endometrial ablation.

**Table 1. Pivotal Subjects Number and Percentage of Subjects with One or More Related<sup>a</sup> Adverse Events by Time of Occurrence Through 12 Months**

<b>N=155</b>					
<b>Adverse Event</b>	<b>Day of Ablation</b>	<b>Day 1 After Ablation</b>	<b>&gt;Day 1 to ≤2 Weeks</b>	<b>&gt;2 Weeks to 1 Year</b>	<b>Total</b>
Uterine Cramping	53 (34.2%)	3 (1.9%)	2 (1.3%)	6 (3.9%)	62 <sup>b</sup> (40.0%)
Nausea	10 (6.5%)				10 (6.5%)
Vomiting	5 (3.2%)				5 (3.2%)
Vaginal Infection		1 (0.6%)	3 (1.9%)	1 (0.6%)	4 <sup>b</sup> (2.6%)
Abdominal Pain	4 (2.6%)				4 (2.6%)
Abdominal Distension	1 (0.6%)	1 (0.6%)	1 (0.6%)		3 (1.9%)
Endometritis			2 (1.3%)		2 (1.3%)
Syncope	1 (0.6%)				1 (0.6%)
Back Pain Over SI Joint	1 (0.6%)				1 (0.6%)
Difficulty With Defecation or Micturition (urination)		1 (0.6%)			1 (0.6%)
Fever		1 (0.6%)			1 (0.6%)
Urinary Tract Infection (UTI)		1 (0.6%)			1 (0.6%)
Vaginal Bleeding			1 (0.6%)		1 (0.6%)
External Vaginal Itching			1 (0.6%)		1 (0.6%)
Lightheadedness			1 (0.6%)		1 (0.6%)
Spotting			1 (0.6%)		1 (0.6%)
Intermittent Vaginal Spotting				1 (0.6%)	1 (0.6%)
Prolonged Spotting				1 (0.6%)	1 (0.6%)
Hematometra				1 (0.6%)	1 (0.6%)
Low Back Pain				1 (0.6%)	1 (0.6%)
Menometrorrhagia				1 (0.6%)	1 (0.6%)

<sup>a</sup> Possible, probable or definitely related to device or procedure

<sup>b</sup> Subjects with more than one occurrence of same event are only counted once

**Tables 2 and 3** below show the number and percentage of subjects who reported gynecologic adverse events during the >12-24 month and >24-36 month follow-up period.

**Table 2. Number and Percentage of Subjects with One or More Gynecologic Adverse Events >12-24 Months**

<b>Adverse Event</b>	<b>N=143</b>
Menorrhagia	5 (3.5%)
Endometriosis	2 (1.4%)
Hematometra	1 (0.7%)
Dysfunctional Uterine Bleeding	1 (0.7%)
Pelvic Pain	1 (0.7%)
Uterine Cramping	1 (0.7%)
Cyclic Uterine Cramping	1 (0.7%)
Intermittent Uterine Cramping	1 (0.7%)
Irregular Cycle	1 (0.7%)
Menstrual-related/Cyclic Headaches	1 (0.7%)
Headache	1 (0.7%)
Anemia	1 (0.7%)
Cervical Polyp	1 (0.7%)
Ovulation Pain	1 (0.7%)
Vaginal Dryness	1 (0.7%)
Night Sweats	1 (0.7%)
Recurrent Yeast Infections	1 (0.7%)
Ruptured Ovarian Cyst	1 (0.7%)
Vulvar Condyloma	1 (0.7%)

**Table 3. Number and Percentage of Subjects with One or More Gynecologic Adverse Events >24-36 Months**

<b>Adverse Event</b>	<b>N=136</b>
Menorrhagia	4 (2.9%)
Uterine Cramping	3 (2.2%)
Dysfunctional Uterine Bleeding	2 (1.1%)
Cyclic Uterine Cramping	1 (0.7%)
Intermittent Uterine Cramping	1 (0.7%)
Dysmenorrhea	1 (0.7%)
Adenomyosis (pain)	1 (0.7%)
Abnormal Uterine Bleeding	1 (0.7%)
Clots with Menses	1 (0.7%)
Irregular Cycle	1 (0.7%)
Ovarian Pain and Cramping Prior to Cycle	1 (0.7%)
Right Ovarian Pain	1 (0.7%)
Ovulation Pain	1 (0.7%)
Right Lower Quadrant Pain	1 (0.7%)
Pelvic Pain	1 (0.7%)
Menstrual-related/Cyclic Headaches	1 (0.7%)
Headache	1 (0.7%)
Endometriosis	1 (0.7%)
Recurrent Yeast Infections	1 (0.7%)
Intramural Leiomyoma	1 (0.7%)
Vulvar Condyloma	1 (0.7%)
Menopausal Symptoms	1 (0.7%)
Night Sweats	1 (0.7%)
Climacteral Complaints	1 (0.7%)

## Hysterectomy – Through Three-year Follow-up

Over the 36-month duration of the trial, there were 10 (6.5%, 10/155) reported hysterectomies. The indications for hysterectomy were menorrhagia (N=6) and pain (N=4). As described below in **Table 4**, there were underlying pathology findings contributing to the indication for hysterectomy. Of note, 60% (6/10) of the hysterectomies had pathology findings of adenomyosis. Adenomyosis is a known cause of ablation treatment failure. Additionally, 40% (4/10) did not meet the study success criteria of PBLAC  $\leq$  75 at the 12-month follow-up visit and thus the progression to hysterectomy did not necessarily indicate a worsening of their condition.

**Table 4. Hysterectomy**

<b>Reason for Hysterectomy</b>	<b>N</b>	<b>Pathology Reported</b>
Menorrhagia	6	Adenomyosis (3) Endometriosis (1) Endometrial Hyperplasia (1) Residual Endometrium (1)
Pain	4	Adenomyosis (3) No pathology finding (1)



## Safety Subjects – Adverse Events

Safety Subjects (n=66) were evaluated for safety only.

**Table 5** below shows the number and percentage of Safety subjects who reported device or procedure related adverse events, one or more times, up to the date of subject early termination from the trial. **There were no reported serious adverse device effects (SADEs) nor any reported serious adverse events (SAEs) that were procedure related.**

**Table 5. Safety Subjects Number and Percentage of Subjects with One or More Related<sup>a</sup> Adverse Events by Time of Occurrence Through 3-6 Months**

N=66						
Adverse Event	Day of Ablation	Day 1 After Ablation	>Day 1 to ≤2 Weeks	>2 Weeks to ≤3 Months	>3 Months to ≤6 Months <sup>b</sup>	Total
Uterine Cramping	32 (48.5%)	1 (1.5%)			1 (2.8%)	34 (51.5%)
Vaginal Infection			3 (4.5%)	1 (1.5%)		4 (6.1%)
Nausea	2 (3.0%)					2 (3.0%)
Vomiting	2 (3.0%)					2 (3.0%)
Cough	1 (1.5%)					1 (1.5%)
Transient Redness on Buttock	1 (1.5%)					1 (1.5%)
Spotting	1 (1.5%)					1 (1.5%)
Endometritis			1 (1.5%)			1 (1.5%)
Abdominal Pain				1 (1.5%)		1 (1.5%)
Uterine Tenderness				1 (1.5%)		1 (1.5%)

<sup>a</sup> Possible, probable or definitely related to device or procedure

<sup>b</sup> 36 patients were followed at 6 months

## Anticipated Post-Procedural Symptoms

For any endometrial ablation procedure, commonly reported postoperative events include the following:

- Post-operative cramping can range from mild to severe. This cramping will typically occur on the day of ablation and typically lasts for a few days following the procedure.
- When present, nausea and vomiting typically occur immediately following the procedure, are associated with anesthesia and can be managed with medication.
- Vaginal discharge
- Vaginal bleeding/spotting

## Other Adverse Events

As with **all** endometrial ablation procedures, serious injury or death can occur. The following adverse events could occur or have been reported in association with the use of other endometrial ablation systems and may occur when the Mara Water Vapor Ablation System is used:

- Post-ablation tubal sterilization syndrome
- Pregnancy-related complications

**Note: pregnancy following any endometrial ablation procedure is dangerous to both the mother and the fetus**

- Thermal injury to adjacent tissue including bowel, bladder, cervix, vagina, vulva and/or perineum, fallopian tubes, ureter
- Perforation of uterine wall
- Hemorrhage
- Uterine necrosis
- Air embolism
- Infection or sepsis
- Complications leading to serious injury or death
- Cervical or vaginal laceration
- Transient change in appearance of the cervical epithelium
- Thermal injury to extremity
- Mechanical bowel injury
- Diarrhea
- Headache

## 9.0 CLINICAL STUDY SUMMARY

### **Purpose**

Two clinical studies were conducted: The Pivotal Clinical Study (Protocol SE-3000), including long-term follow-up, and the Post-Ablation Cavity Evaluation (PACE) study.

The purpose of the CooperSurgical, Inc. Pivotal Clinical Study was to demonstrate the safety and effectiveness of the Mara Water Vapor Ablation System at 12-months in the treatment of heavy menstrual bleeding from benign causes in women whose childbearing is complete. To assess longer-term safety and efficacy, two and three-year outcome data were collected.

The purpose of the PACE study was to examine access to and visualization of the uterine cavity more than three years after having an endometrial ablation with the Mara Water Vapor Ablation System.

Following is a description of the Pivotal Study, including two and three-year follow-up, followed by a description of the PACE Study in section 9.2.

## 9.1 Pivotal Clinical Study, Including Longer-term Follow-up

### **Pretreatment**

Prior to undergoing the ablation procedure, the subject's endometrial lining was thinned using medications or the procedure was scheduled in the early proliferative phase (day 5-10 of cycle). Dilatation & Curettage was not allowed prior to the ablation procedure, with the exception of a light suctioning with a cannula to remove residual clots or loose intracavity debris. The investigator could reschedule the procedure if there was any concern that endometrial thinning was not properly accomplished.

### **Study Endpoints**

#### ***Safety Endpoints***

The following safety endpoints included an assessment of both the Safety and Pivotal subjects:

- Mara Water Vapor Ablation System-related serious adverse events
- Endometrial ablation procedure-related serious adverse events
- The overall rate and severity of all reported adverse events

### ***Primary Effectiveness Endpoint***

The primary effectiveness endpoint was the binary outcome of reduction of menstrual blood loss indicated by a validated Pictorial Blood Loss Assessment Chart (PBLAC) score of  $\leq 75$  12 months after the endometrial ablation procedure. The primary objective of the study was to show that the percent of subjects in the Intent to Treat (ITT) analysis cohort with a PBLAC score  $\leq 75$  was more than the Objective Performance Criteria (OPC) of 66%. The OPC is based on the lower bound of the 95% confidence interval of the average success rate for the first five approved Global Endometrial Ablation (GEA) devices, which also used the PBLAC instrument to assess reduction in bleeding after treatment.

### ***Secondary Effectiveness Endpoints***

The secondary effectiveness endpoints included the following measures of clinical outcome:

- The need for surgical or medical intervention to treat abnormal bleeding at any time within the first 12 months after treatment
- Quality of life using the Menorrhagia Impact Questionnaire 12 months after treatment
- Patient Satisfaction 12 months after treatment

## ***Additional Analyses***

Additional analyses were:

- Amenorrhea rate (PBLAC=0)
- Mean procedure time
- Anesthesia use and setting of care
- Post-operative pain using a Numerical Rating Scale
- Return to work and normal daily activities
- Dysmenorrhea (pain during menstruation) as derived from the Aberdeen Menorrhagia Severity Scale (AMSS)
- Safety and effectiveness in women with and without Cesarean Section
- Safety and effectiveness in subjects with myomas
- Safety and effectiveness in subjects with uterine length 10-12cm
- Safety and effectiveness in subjects with Essure® Permanent Birth Control
- Impact on sex life
- Recommend ablation procedure to a friend

## **Long-Term Follow-up**

Two- and three-year follow-up was conducted in the Pivotal Clinical Study subjects.

The long-term follow-up safety endpoints were an assessment of:

- Gynecology adverse events
- Subject self-report of pregnancy

The long-term follow-up effectiveness endpoints included:

- Menstrual status collected at 24- and 36-month follow-up
- The need for surgical or medical intervention to treat abnormal bleeding at any time after 12-month follow-up
- Quality of Life using the Menorrhagia Impact Questionnaire (MIQ) collected at 24- and 36-month follow-up
- Patient satisfaction collected at 24- and 36-month follow-up

## **Methods**

A single arm, prospective, multicenter clinical study was conducted at 14 sites by investigators experienced with endometrial ablation. Subjects were required to meet a set of entry criteria.



## **Key Inclusion Criteria**

- Women aged 30 to 50 years
- Self-reported history of heavy menstrual bleeding in at least 3 of the last 6 months
- Predictable cyclic menstrual cycles over past 6 months
- Excessive uterine bleeding (PBLAC score of  $\geq 150$ )
- Pre-menopausal at enrollment
- Normal PAP
- Normal endometrial biopsy
- Willing to use reliable contraception

## **Key Exclusion Criteria**

- Pregnant
- Desires future childbearing
- Presence of an IUD
- Previous endometrial ablation procedure
- Evidence of STI
- Evidence PID
- Active infection of the genitals, vagina, cervix, uterus or urinary tract
- Active endometritis
- Active bacteremia, sepsis or other active systemic infection

- Gynecologic malignancy
- Endometrial hyperplasia
- Known clotting defects or bleeding disorders
- On anticoagulant therapy
- Prior uterine surgery
- Currently on medications that could thin the myometrial muscle
- Severe dysmenorrhea secondary to adenomyosis
- Abnormal uterine cavity
- Hydrosalpinx
- Uterine length <6cm or >12 cm
- Cannot tolerate anesthesia

### **Patient Population**

The baseline demographic and gynecological history parameters are presented on the right in **Table 6**. Pooling of the data involved an assessment of the demographic and gynecological history data among sites to verify the ablation procedures were conducted in similar patient populations as prescribed in the protocol.

**Table 6. Demographics and Gynecological History**

<b>N=155</b>		
<b>Age</b>	Mean $\pm$ SD (median)	39.8 $\pm$ 5.2 (40.0)
	Range (min, max)	(30, 50)
	N Age 30-39	76 (49.0%)
	N Age 40-50	79 (51.0%)
<b>Ethnicity</b>	Hispanic or Latino	36 (23.2%)
	Not Hispanic or Latino	119 (76.8%)
<b>Race</b>	American Indian or Alaska Native	0 (0.0%)
	Asian	3 (1.9%)
	Black or African American	5 (3.2%)
	Native Hawaiian or Other Pacific Islander	0 (0.0%)
	White	147 (94.8%)
<b>BMI, kg/m<sup>2</sup></b>	Mean $\pm$ SD (median)	30.0 $\pm$ 7.4 (29.0)
	Range (min, max)	18, 51
<b>Gravidity</b>	Mean $\pm$ SD (median)	3.2 $\pm$ 1.7 (3.0)
	Range (min, max)	0, 13
<b>Parity</b>	Mean $\pm$ SD (median)	2.6 $\pm$ 1.3 (3.0)
	Range (min, max)	0, 7
<b>Menstrual History</b>	Dysmenorrhea	132 (85.2%)
<b>PBLAC Score at Baseline</b>	Mean $\pm$ SD (median)	320.7 $\pm$ 155.9 (278.3)
	Range (min, max)	153.0, 865.8
<b>FSH (IU/L)</b>	Mean $\pm$ SD (median)	6.2 $\pm$ 3.7 (5.3)
	Range (min, max)	0.10, 21.2

## Pivotal Subjects Disposition

A total of 155 Pivotal subjects were scheduled for endometrial ablation with the Mara Water Vapor Ablation System. **Table 7** below provides the disposition for the Pivotal subjects through the end of long-term follow-up.

**Table 7. Pivotal Subjects Disposition**

<b>ITT Analysis Cohort: Vapor Ablation Attempted</b>		<b>N=155</b>
No treatment received	Integrity Test did not pass	-2
	Patency Test did not pass	-4
<b>Modified ITT (mITT) Analysis Cohort</b>		<b>N=149</b>
All ITT subjects who completed treatment		
	Incomplete Treatment	-2
	Lost to follow-up	-1
	Suicide	-1
	Hysterectomy for pain	-1
	IUD for heavy bleeding	-1
	Major protocol deviations	-2
<b>12-Month Follow-up Per Protocol Cohort</b>		<b>N=141</b>
	Hysterectomy for menorrhagia	-4
	Repeat ablation for menorrhagia	-1
	Laparoscopy, operative hysteroscopy and hysteroscopic ablation for endometriosis	-1
	Lost-to-follow-up	-1
	Voluntary withdrawal – subject moved	-1
<b>24-Month Follow-up Per Protocol Cohort</b>		<b>N=133</b>
	Hysterectomy for menorrhagia	-2
	Hysterectomy for pelvic pain	-3
	Mirena IUD placement for menorrhagia	-2
	Subject lost-to-follow-up at 12 and 24 months, returned for 36-month follow-up	+1
	Lost-to-follow-up	-2
<b>36-Month Follow-up Per Protocol Cohort</b>		<b>N=125</b>

## **Ablation Procedure Results**

The ablation procedure data are summarized on page 38 in **Table 8**. The mean average procedure time was 4.2 minutes. Procedure time is defined as the difference between the time of Water Vapor Probe insertion and the time of Water Vapor Probe removal.

The anesthesia regimen in 94% (146/155) of ablation procedures included combinations of IV, oral and local anesthesia. General anesthesia was used in 6% (9/155) of cases.

97% of the ablation procedures were performed in an office or ambulatory center/outpatient setting of care. The ablation procedure was performed in an operating room in 3% of cases due to the availability of only an operating room setting for that particular investigational site.

Uterine position was anteverted in 53% (82/155) of subjects. Cervical dilation was utilized in 66% (102/155) of cases with a mean dilator size of 6.3mm.

**Table 8. Ablation Procedure Results**

<b>Average Procedure Time (min)</b>		<b>N=155</b>
	Mean $\pm$ SD (median)	4.2 $\pm$ 1.6 (4.0)
	Range (min, max)	(0, 12)
<b>Anesthesia Regimen</b>		<b>N=155</b>
	IV, Oral, Local	118 (76%)
	Local, Oral	28 (18%)
	General	9 (6%)
<b>Setting of Care</b>		<b>N=155</b>
	Office	82 (53%)
	Ambulatory Center/Outpatient	68 (44%)
	Operating Room	5 (3%)
<b>Uterine Position<sup>a</sup></b>		<b>N=155</b>
	Anteverted	82 (53%)
	Midline-Axial	31 (20%)
	Retroverted	24 (16%)
	Anteflexed	15 (9%)
	Retroflexed	10 (7%)
<b>Cervical Dilatation (mm)</b>		<b>N=102</b>
	Mean $\pm$ SD (median)	6.3 $\pm$ 1.1 (6.0)
	Range (min, max)	(2.5, 9.0)
<b>Uterine Length (cm)</b>		<b>N=154</b>
	Mean $\pm$ SD (median)	9.0 $\pm$ 1.1 (9.0)
	Range (min, max)	(6.0, 12.0)
	Uterine Length $\leq$ 10	141 (92%)
	Uterine Length >10-12	13 (8%)

<sup>a</sup> Subjects may have more than one response for uterine position since there may be -version and -flexion positions.

## Primary Effectiveness Endpoint

The primary effectiveness endpoint was the binary outcome of reduction of menstrual blood loss indicated by a PBLAC score of  $\leq 75$  12 months after the endometrial ablation procedure. The primary objective of the study was to show that the percent of subjects in the Intent to Treat (ITT) analysis cohort with a PBLAC score  $\leq 75$  was more than the Objective Performance Criteria (OPC) of 66%.

The primary effectiveness endpoint results are as follows:

78.7% (122/155) of subjects in the ITT analysis cohort had a PBLAC score  $\leq 75$  12 months after the endometrial ablation procedure. This is statistically significantly greater than the OPC of 66% (p-value = 0.0004).

Menstrual status at 12-, 24- and 36-month follow-up was reported as none (amenorrhea), light, moderate, heavy or very heavy based on a questionnaire (Menstrual Impact Questionnaire). Data presented in **Table 9** below represent the results based on the total number of subjects who responded to the questionnaire.

**Table 9. Menstrual Status**

Menstrual Status	Month 12 N=140	Month 24 N=133	Month 36 N=125
Amenorrhea (no menses)	20.0% (28)	24.8% (33)	23.2% (29)
Light	47.1% (66)	50.4% (67)	48.8% (61)
Moderate	25.7% (36)	19.5% (26)	22.4% (28)
Heavy	6.4% (9)	3.8% (5)	3.2% (4)
Very Heavy	0.7% (1)	1.5% (2)	2.4% (3)

## Secondary Effectiveness Endpoints

### *Need for Surgical or Medical Intervention to Treat Abnormal Bleeding*

There was only one subject who had medical intervention (insertion of an IUD) to treat ongoing heavy menstrual bleeding prior to her 12-month visit. No subjects required surgical intervention to treat ongoing heavy menstrual bleeding prior to the 12-month visit.

### *Follow-up Through Three Years*

In long-term follow-up, nine (9) subjects had medical or surgical intervention to treat abnormal menstrual bleeding (menorrhagia). Six of these subjects did not meet the study success criteria of a PBLAC diary score  $\leq 75$  at 12-month follow-up thus indicating that their need for medical or surgical intervention did not necessarily represent a worsening of their condition.

As shown right in **Table 10** five (5) subjects had an intervention during >12-24 month follow-up and four (4) subjects had an intervention during >24-36 month follow-up.

Six (6) of the nine (9) subjects had a hysterectomy as previously presented above in **Table 7**. One (1) subject had a repeat endometrial ablation, and two (2) subjects had Mirena IUD placements.



**Table 10. Medical/Surgical Intervention to Treat Abnormal Bleeding**

Intervention	>12-24 Month N	>24-36 Month N
Hysterectomy	N=4	N=2
Repeat Endometrial Ablation	N=1	N=0
IUD Placement	N=0	N=2
<b>Total</b>	<b>N=5</b>	<b>N=4</b>

### *Quality of Life*

The Menorrhagia Impact Questionnaire (MIQ) was administered at baseline and at 12-, 24-, and 36-month follow-up to assess quality of life. The baseline mean score of 14.7 reduced to a mean score of 6.6, 6.1 and 6.3 at 12-, 24-, and 36-month follow-up, respectively. These data are presented below in **Table 11**.

**Table 11. Quality of Life Improvement (MIQ)**

	Baseline N=141	Month 12 N=141	Month 24 N=133	Month 36 N=125
Mean $\pm$ SD (median)	14.7 $\pm$ 2.9 (15.0)	6.6 $\pm$ 1.8 (6.0)	6.1 $\pm$ 1.7 (6.0)	6.3 $\pm$ 1.9 (6.0)
Range (min, max)	(6, 21)	(4, 15)	(4, 16)	(4, 17)
95% CI (CI of mean change from baseline)		-8.7, -7.6	-9.1, -8.0	-9.0, -7.8

## ***Patient Satisfaction***

Subjects were asked to report their overall satisfaction with the ablation procedure. These data are presented below in **Table 12**.

**Table 12. Patient Satisfaction**

<b>Satisfaction Response</b>	<b>12-Month N=141</b>	<b>24-Month N=132*</b>	<b>36-Month N=125</b>
Very Satisfied or Satisfied	<b>90.8%</b> (128) 95% CI (84.8%, 95.0%)	<b>89.4%</b> (118) 95% CI (82.9%, 94.1%)	<b>91.2%</b> (114) 95% CI (84.8%, 95.5%)
Very Satisfied	70.2% (99)	70.5% (93)	76.0% (95)
Satisfied	20.6% (29)	18.9% (25)	15.2% (19)
Not Sure	7.1% (10)	7.6% (10)	4.8% (6)
Dissatisfied	2.1% (3)	3.0% (4)	4.0% (5)
Very Dissatisfied	0% (0)	0% (0)	0% (0)

\* Satisfaction data not collected from one subject at 24-month follow-up

## **Additional Analyses:**

### ***Amenorrhea rate***

Data provided in “Primary Effectiveness,” **Table 9**.

### ***Mean procedure time***

Data provided in “Ablation Procedure Results,” **Table 8**.

### ***Anesthesia use and setting of care***

Data provided in “Ablation Procedure Results,” **Table 8**.

### ***Recommend ablation procedure to a friend***

Subjects were asked to report if they would recommend the ablation procedure to a friend. These data are presented below in **Table 13**.

**Table 13. Recommend to a Friend**

<b>Recommend to Friend</b>	<b>12-Month N=140</b>	<b>24-Month N=132*</b>	<b>36-Month N=125</b>
Yes	<b>92.9%</b> (130) 95% CI (86.5%, 96.0%)	<b>92.4%</b> (122) 95% CI (86.5%, 96.3%)	<b>94.4%</b> (118) 95% CI (88.8%, 97.7%)
No	7.1% (10)	7.6% (10)	5.6% (7)

\* 24-month recommend to a friend data was not collected from one subject

### ***PBLAC $\leq 75$ Subjects with and without Cesarean Section***

There were 43.2% (67/155) of subjects who had one or more prior C-sections and 56.8% (88/155) who did not have a prior C-section at the time of endometrial ablation. As shown below in Table 14, 80.6% (54/67) of women with a prior C-section and 77.3% (68/88) without a prior C-section in the ITT analysis cohort met the study success criteria of PBLAC  $\leq 75$ . These data demonstrate that women with prior C-sections achieved similar outcomes in menstrual bleeding reduction when compared to women without prior C-sections. Data are presented below in **Table 14**.

**Table 14. PBLAC  $\leq 75$  in Subjects with and without C-Section**

	<b>ITT</b>
<b>With C-section</b>	54/67 (80.6%)
<b>Without C-section</b>	68/88 (77.3%)
<b>All Subjects</b>	122/155 (78.7%)

Menstrual status at 12-, 24- and 36-months follow-up in the Per Protocol group was reported as none (amenorrhea), light, moderate, heavy or very heavy based on a questionnaire (Menstrual Impact Questionnaire). Data presented in **Table 15** on the right represent the results for subjects with and without C-Section based on the total number of Per Protocol subjects who responded to the questionnaire.

**Table 15. Menstrual Status in Subjects with and without C-Section**

Menstrual Status	12-Month N=140* (Per Protocol)		24-Month N=133 (Per Protocol)		36-Month N=125 (Per Protocol)	
	With C-section N=61	Without C-section N=79*	With C-section N=57	Without C-section N=76	With C-section N=51	Without C-section N=74
<b>Amenorrhea</b>	26.2% (16)	15.2% (12)	36.8% (21)	15.8% (12)	33.3% (17)	16.2% (12)
<b>Light</b>	39.3% (24)	53.2% (42)	47.4% (27)	52.6% (40)	47.1% (24)	50.0% (37)
<b>Moderate</b>	26.2% (16)	25.3% (20)	12.3% (7)	25.0% (19)	17.6% (9)	25.7% (19)
<b>Heavy</b>	8.2% (5)	5.1% (4)	3.5% (2)	3.9% (3)	2.0% (1)	4.1% (3)
<b>Very Heavy</b>	0.0% (0)	1.3% (1)	0.0% (0)	2.6% (2)	0.0% (0)	4.1% (3)

**Precaution:** The structure of the endometrial cavity and uterine wall should be thoroughly evaluated to ensure suitability for thermal endometrial ablation. The use of transvaginal ultrasonography, saline infusion sonohysterography, hysteroscopy, or a combination of these procedures should be performed to evaluate the uterine architecture for structural anomalies. These various imaging modalities can also be used to identify the position of an obvious and visible structural anomaly from prior transmural uterine surgery such as a Cesarean Scar Defect to confirm that it does not present with thin myometrium located within the uterine cavity where thermal endometrial ablation will be performed. If a structural anomaly is found within the uterine cavity, then best clinical judgment should be used before performing thermal endometrial ablation.

\* Menstrual Status was not reported by one subject at 12-month follow-up

## ***Subjects with and without Myomas***

There were 29/155 (19%) of subjects with myomas that did not obstruct access to the uterine cavity or prevent uterine distension. There were no device or procedure-related serious adverse events reported in these subjects.

The recording of myoma type was done according to the International Federation of Gynecology and Obstetrics (FIGO) classification system.

Subjects in the ITT analysis cohort had submucosal (type 2), intramural (types 3 and 4) and/or subserosal myomas (types 5 and 6). Myoma size ranged from 0.6-6.0 cm.

Data for the number, size and type of myomas in subjects with PBLAC  $\leq 75$  are reflected in **Table 16**.

**Table 16. Number, Size and Types of Myomas in Subjects with PBLAC  $\leq 75$**

<b>FIGO Classification Number</b>	<b>Classification Name</b>	<b>Myomas N</b>	<b>Patients N*</b>	<b>Size Range of Myomas (cm)</b>
<b>2</b>	Submucosal $\geq 50\%$ Intramural	2	2	0.8 - 1.3
<b>3</b>	Contacts Endometrium 100% Intramural	4	4	2.1 - 3.7
<b>4</b>	Intramural	12	7	0.8 - 3.3
<b>5</b>	Subserosal $\geq 50\%$ Intramural	3	3	2.5 - 4.0
<b>6</b>	Subserosal <50% Intramural	6	6	1.1 - 6.0
<b>Total</b>		27	19*	

\* There were a total of 19 subjects with myomas who met the 12-month effectiveness endpoint. Four subjects had more than one myoma/type.

At the 12-month follow-up visit, there were 65.5% (19/29) of subjects with myomas versus 81.7% (103/126) without myomas who met the study success criteria of PBLAC  $\leq 75$ . These data show that no safety issues were identified and that approximately two-thirds of subjects with myomas were successfully treated. Data are presented below in **Table 17**.

**Table 17. 12-month PBLAC  $\leq 75$  in Subjects with and without Myomas**

	<b>ITT</b>
<b>With Myomas</b>	19/29 (65.5%)
<b>Without Myomas</b>	103/126 (81.7%)
<b>All Subjects</b>	122/155 (78.7%)

Menstrual status at 12-, 24- and 36-month follow-up was reported as none (amenorrhea), light, moderate, heavy or very heavy based on a questionnaire (Menstrual Impact Questionnaire). Data presented in **Table 18** on the next page represent the results for subjects with and without myoma based on the total number of Per Protocol subjects who responded to the questionnaire.

**Table 18. Menstrual Status in Subjects with and without Myomas**

Menstrual Status	12-Month N=140* (Per Protocol)		24-Month N=133 (Per Protocol)		36-Month N=125 (Per Protocol)	
	With Myomas N=24	Without Myomas N=116	With Myomas N=24	Without Myomas N=109	With Myomas N=24	Without Myomas N=101
<b>Amenorrhea</b>	16.7% (4)	20.7% (24)	20.8% (5)	25.7% (28)	25.0% (6)	22.8% (23)
<b>Light</b>	50.0% (12)	46.6% (54)	45.8% (11)	51.4% (56)	45.8% (11)	49.5% (50)
<b>Moderate</b>	20.8% (5)	26.7% (31)	20.8% (5)	19.3% (21)	25.0% (6)	21.8% (22)
<b>Heavy</b>	8.3% (2)	6.0% (7)	8.3% (2)	2.8% (3)	0.0% (0)	4.0% (4)
<b>Very Heavy</b>	4.2% (1)	0.0% (0)	4.2% (1)	0.9% (1)	4.2% (1)	2.0% (2)

***Subjects with Uterine Length 10 cm to 12 cm***

There were 74.1% (115/155) of subjects who had a uterine length 6 cm to 9.9 cm and 25.8% (40/155) with uterine length 10 cm to 12 cm. There were no device or procedure-related serious adverse events reported in these subjects.

In the Mara subpopulation of subjects with uterine length 10 cm to 12 cm, 77.5% (31/40) in the ITT analysis cohort had a 12-month PBLAC score of  $\leq 75$ . This represents a significant portion of the study population with large cavities who were successfully treated with the Mara Water Vapor Ablation System. Both aggregate and detailed data of uterine lengths with the associated success rates are presented on the right in **Tables 19** and **20**.

\* Menstrual Status was not reported by one subject at 12-month follow-up



**Table 19. PBLAC  $\leq 75$  in Subjects with Uterine Lengths 6 cm to 9.9 cm and 10 cm to 12 cm**

<b>Uterine Length (cm)</b>	<b>PBLAC Score <math>\leq 75</math> N/N (%)</b>
6 cm - 9.9 cm	91/115 (79%)
10 cm - 12 cm	31/40 (77.5%)

**Table 20. Uterine Length Subgroups**

<b>Uterine Length (cm)</b>	<b>PBLAC Score <math>\leq 75</math> N/N (%)</b>
6-6.9 cm	2/5 (40%)
7-7.9 cm	11/12 (92%)
8-8.9 cm	28/39 (72%)
9-9.9 cm	50/59 (85%)
10-10.9 cm	21/29 (72%)
11-11.9 cm	9/10 (90%)
12 cm	1/1 (100%)

Menstrual status at 12-, 24- and 36-month follow-up was reported as none (amenorrhea), light, moderate, heavy or very heavy based on a questionnaire (Menstrual Impact Questionnaire). Data presented in **Table 21** below represent the results for subjects with uterine length 10-12 cm, based on the total number of Per Protocol subjects who responded to the questionnaire.

**Table 21. Menstrual Status in Subjects with Uterine Length  $\geq$ 10cm to 12 cm**

	<b>12-Month N=140* (Per Protocol)</b>	<b>24-Month N=133 (Per Protocol)</b>	<b>36-Month N=125 (Per Protocol)</b>
<b>Menstrual Status</b>	Uterine Length 10-12cm (N=33)	Uterine Length 10-12cm (N=32)	Uterine Length 10-12cm (N=30)
<b>Amenorrhea</b>	27.3% (9)	37.5% (12)	23.3% (7)
<b>Light</b>	45.5% (15)	40.6% (13)	50.0% (15)
<b>Moderate</b>	21.2% (7)	15.6% (5)	16.7% (5)
<b>Heavy</b>	6.1% (2)	6.3% (2)	3.3% (1)
<b>Very Heavy</b>	0.0% (0)	0.0% (0)	6.7% (2)

\* Menstrual Status was not reported by one subject at 12-month follow-up

### ***Subjects with Essure® Permanent Birth Control***

There were 5% (8/155) of subjects in the ITT cohort who were relying on Essure® Permanent Birth Control inserts for contraception at the time of study screening. There were no serious device or procedure related adverse events in these subjects. At the 12-month follow-up visit, there were 75% (6/8) of subjects who met the study's success criteria with a PBLAC score  $\leq 75$ .

Menstrual status at 12-, 24- and 36-month follow-up was reported as none (amenorrhea), light, moderate, heavy or very heavy based on a questionnaire (Menstrual Impact Questionnaire). Data presented in **Table 22** below represent the results for subjects with Essure, based on the total number of Per Protocol subjects who responded to the questionnaire.

**Table 22. Menstrual Status in Subjects with Essure Permanent Birth Control**

	<b>12-Month N=140 (Per Protocol)</b>	<b>24-Month N=133 (Per Protocol)</b>	<b>36-Month N=125 (Per Protocol)</b>
<b>Menstrual Status</b>	With Essure (N=7)	With Essure (N=7)	With Essure (N=6)
<b>Amenorrhea</b>	14.3% (1)	0.0% (0)	16.7% (1)
<b>Light</b>	85.7% (6)	100% (7)	83.3% (5)
<b>Moderate</b>	0.0% (0)	0.0% (0)	0.0% (0)
<b>Heavy</b>	0.0% (0)	0.0% (0)	0.0% (0)
<b>Very Heavy</b>	0.0% (0)	0.0% (0)	0.0% (0)

### ***Post-operative Pain Using a Numerical Rating Scale***

At 24 hours and two-weeks following endometrial ablation, subjects were asked to report their pain using a Numeric Rating Scale with 0 representing no pain and 10 representing unbearable pain. These data are summarized below in **Table 23**. At 24 hours post-op, the mean pain rating was 3.8. At two weeks post-op, the mean pain rating reduced to 1.5. To put these pain scores into context, subjects were asked to rate their typical pain with menses prior to having the ablation procedure. The mean rating in response to this baseline question was 4.6, which represents worse pain than the mean value reported at 24 hours post-op.

**Table 23. Post-operative Pain Using a Numerical Rating Scale**

<b>Post-operative Pain</b>	<b>24 Hours (N=141)</b>	<b>2 Weeks (N=141)</b>
Mean $\pm$ SD (median)	3.8 $\pm$ 2.8 (4.0)	1.5 $\pm$ 1.9 (1.0)
Range (min, max)	(0, 10)	(0, 8)
95% CI	(3.3, 4.2)	(1.2, 1.9)

### ***Return to Work and Normal Daily Activities***

At the two-week follow-up visit, subjects were asked to report when they returned to work either inside or outside the home and when they returned to normal daily activities. These data are summarized below in **Table 24**.

**Table 24. Return to Work and Normal Daily Activities**

<b>2 Week Follow-up</b>	<b>Return to Work N=136</b>	<b>Return to Normal Daily Activities N=141</b>
Mean $\pm$ SD (median)	1.9 $\pm$ 1.7 (1.0)	2.5 $\pm$ 2.6 (2.0)
Range (min, max)	(0, 10)	(0, 14)
95% CI	(1.6, 2.1)	(2.0, 2.9)
Returned <1 Day	12 (8.8%)	15 (10.6%)
Returned in 1 Day	63 (46.3%)	55 (39.0%)
Returned in 2 Days	32 (23.5%)	31 (22.0%)
Returned in 3 Days	14 (10.3%)	8 (5.7%)

### ***Dysmenorrhea (pain during menstruation)***

At baseline and follow-up, the Aberdeen Menorrhagia Severity Scale was used to ask subjects to rate on average, over the past three months, if their periods had been associated with any pain. The results are shown in **Table 25** below.

**Table 25. Dysmenorrhea at Baseline versus 12-Month Follow-up**

<b>Outcome</b>	<b>Baseline N=136</b>	<b>Month 12 N=141</b>
Dysmenorrhea	121 (85.8%)	48 (34.0%)
95% CI	79%, 91.1%	26.3%, 42.5%

A shift analysis was also completed to evaluate subjects who had improved, were unchanged or had worsened pain with menses when comparing baseline to 12 month follow-up. The results are shown below in **Table 26**.

**Table 26. Dysmenorrhea Shift: Baseline versus 12-Month Follow-up**

<b>Shift in Outcome</b>	<b>N=112</b>
Improved	81 (72.3%)
Unchanged	26 (23.2%)
Worsened	5 (4.5%)

### ***Impact on Sex Life***

At baseline and follow-up, the Aberdeen Menorrhagia Severity Scale was used to ask subjects to rate on average, over the past three months, if their sex life had been affected by heavy periods. Results are shown below in **Table 27**.

**Table 27. Impact on Sex Life: Baseline vs. 12-Month Follow-up**

<b>Outcome</b>	<b>Baseline N=141</b>	<b>Month 12 N=112</b>
Impact on Sex Life	112 (79.4%)	6 (5.4%)
95% CI	71.8%, 85.8%	2.0%, 11.3%

A shift analysis was also completed to evaluate subjects whose sex life had improved, was unchanged or had a worsened due to heavy periods. Results are shown below in **Table 28**.

**Table 28. Impact on Sex Life Shift: Baseline vs. 12-Month Follow-up**

<b>Shift in Outcome</b>	<b>N=91</b>
Improved	77 (84.6%)
Unchanged	13 (14.3%)
Worsened	1 (1.1%)

## 9.2 Post-Ablation Cavity Evaluation (PACE) Study

### **Purpose**

A follow-up study, PACE (Post-Ablation Cavity Evaluation), was conducted by eight of the Pivotal study Investigators/sites and enrolled 72 subjects who completed the three-year follow-up in the Pivotal study.

The goal of the PACE study was to examine access to and visualization of the uterine cavity more than three years after having an endometrial ablation with the Mara Water Vapor Ablation System.

### **Study Endpoints**

#### ***Safety Endpoint***

The safety endpoints were an assessment of:

- Diagnostic hysteroscopy-related serious adverse events
- The overall rate and severity of all reported gynecologic adverse events

#### ***Primary Observational Endpoint***

The primary observational endpoint was the ability to access the uterine cavity and perform a diagnostic hysteroscopic exam more than three years after having an endometrial ablation with the Mara Water Vapor Ablation System.



## ***Other Observational Endpoints***

Other observational endpoints included the following:

- The ability to visualize the uterine cornua/ostia
- The presence of adhesions within the endometrial cavity
  - The characteristics of adhesions<sup>3</sup> (minimal, moderate, severe) within the endometrial cavity

## **Study Design**

The PACE study was a prospective, observational, multi-center, single-arm, clinical study. Subjects were required to meet a set of entry criteria.

### ***Key Inclusion Criteria***

- Completed three-year follow-up in the Pivotal Trial (Protocol SE-3000);

### ***Key Exclusion Criteria***

- After completing the Pivotal Trial, had a repeat endometrial ablation, insertion of an IUD, or any other gynecologic procedure involving the application of an energy source or dissection of endometrial tissue;

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<sup>3</sup> March C, Israel R, March A. Hysteroscopic Management of Intrauterine Adhesions. Am J Obstet Gynecol 1978; 130:653-57

## **Selection Bias Analysis**

Of the 125 eligible subjects who completed three-year follow-up in the Pivotal Trial, 72 subjects were enrolled in the PACE study at 8 sites that had participated in the Pivotal Clinical Study. Sites were selected based on higher enrollment in the Pivotal Clinical Study, and the ability to work through the PACE study set-up and approval requirements. These considerations were intended to yield enrollment in the PACE study in a timely fashion. Within the sites participating in the PACE study, 100% of Pivotal Study subjects who completed the 3-year follow-up were invited to participate, if eligible, based on the Inclusion and Exclusion criteria. A statistical analysis was performed to assess the comparability of the enrolled subjects with those in the Pivotal Clinical study who did not enroll in the PACE study.

In general, the subjects that enrolled in the PACE study are comparable to the subjects who did not. No clinically meaningful differences were seen between the two cohorts of subjects in their baseline characteristics, past menorrhagia treatment, endometrial ablation procedure characteristics, PBLAC results one year after the procedure, quality of life (Menorrhagia Impact Questionnaire) results three years after the procedure, subject satisfaction three years after the procedure, post-operative pain, and the menstrual status (determined by Question 2 of the MIQ) three years after the procedure.

## Patient Population

The baseline demographics are presented below in **Table 29** and the duration of time since the vapor endometrial ablation is presented on the next page in **Table 30**. Data from two subjects were excluded from analysis. The first subject was excluded from analysis due to a major protocol violation. The subject had a fundal polypectomy after completing the Pivotal Trial but prior to PACE enrollment. This violated an exclusion criterion specifying that subjects should not have any other gynecologic procedure involving the application of an energy source or dissection of endometrial tissue. The second subject was excluded from analysis due to a corrupted hysteroscopy video, thus precluding the Independent Reviewer's ability to view the imagery and report his observations.

**Table 29. Demographics**

N=70		
<b>Age</b>	Mean $\pm$ SD (median)	43 $\pm$ 5 (43)
	Range (min, max)	33, 54
<b>Ethnicity</b>	Hispanic or Latino	30% (21)
	Not Hispanic or Latino	70% (49)
<b>Race</b>	American Indian or Alaska Native	0% (0)
	Asian	1% (1)
	Black or African American	3% (2)
	Native Hawaiian or Other Pacific Islander	0% (0)
	White	96% (67)
<b>BMI, kg/m<sup>2</sup></b>	Mean $\pm$ SD (median)	29.9 $\pm$ 7.0 (28.4)
	Range (min, max)	17, 51

**Table 30. Duration Since Vapor Endometrial Ablation**

<b>Duration Since Ablation</b>	<b>Years</b>
Mean $\pm$ SD (median)	3.9 $\pm$ 0.3 (3.9)
Range (min, max)	3.4, 4.4

## **Diagnostic Hysteroscopy Procedure**

Hysteroscopy videos and still images were acquired in a standardized manner per pre-established guidelines.

To ensure consistency of image interpretation across all study sites, a qualified independent clinician (“Independent Reviewer”) evaluated the submitted images. The image review data recorded by the Independent Reviewer is the study data used for the analysis of results.

## **Results**

### ***Cavity Access***

The primary observational endpoint of this study was the ability to access the uterine cavity and perform a diagnostic hysteroscopic exam after having an endometrial ablation with the Mara Water Vapor Ablation System.

As shown on the right in **Table 31**, cavity access with a diagnostic hysteroscopic exam was achieved in 90% (63/70) of subjects. Access only to the endocervical canal alone occurred in 10% (7/70) of subjects.

**Table 31. Uterine Cavity Access**

	<b>% (N/N)</b>
<b>Uterine Cavity Access</b>	90% (63/70)
<b>No Cavity Access—Endocervical Canal Only</b>	10% (7/70)

### ***Visualization of the Cornua/Ostia***

The ability to visualize the cornua/ostia was an additional observational endpoint. As shown below in **Table 32**, visualization of either bilateral or unilateral cornua/ostia was achieved in 79% (50/63) of cavities accessed, or in 71% (50/70) of all subjects. Bilateral visualization of the cornua/ostia was achieved in 48% (30/63) of cavities accessed, or in 43% (30/70) of all subjects. Unilateral visualization of the cornu/ostium was achieved in 32% (20/63) of cavities accessed or in 29% (20/70) of all subjects.

**Table 32. Visualization of the Cornu/Ostia**

	<b>% (N/N)</b>
<b>Visualization of All Subjects</b>	
Visualization of Cornu/Ostia	71% (50/70)
Bilateral Visualization of Cornua/Ostia	43% (30/70)
Unilateral Visualization of Cornu/Ostia	29% (20/70)
<b>Visualization of Cavities Accessed</b>	
Visualization of Cornu/Ostia	79% (50/63)
Bilateral Visualization of Cornua/Ostia	48% (30/63)
Unilateral Visualization of Cornu/Ostia	32% (20/63)

### ***Presence of Adhesions Within the Endometrial Cavities Accessed by Hysteroscopy***

An assessment was made of the presence and characterization of adhesions per pre-established criteria. As shown below in **Table 33**, there were no adhesions in 75% (47/63) of the cavities. Adhesions were characterized as “minimal” in 11% (7/63), and “moderate” in 11% (7/63). Only three 3% (2/63) had severe adhesions. No data regarding the characterization of adhesions could be obtained from the 7 subjects in whom cavity access was not possible.

**Table 33. Adhesions Within the Endometrial Cavities Accessed\***

	<b>% (N/N)</b>
<b>Presence of Adhesions</b>	
Absent	75% (47/63)
Present	25% (16/63)
<b>Incidence and Characterization of Adhesions</b>	
Minimal	11% (7/63)
Moderate	11% (7/63)
Severe	3% (2/63)

\* Adhesions could not be assessed in seven (7) cavities that were not accessed

## **Safety Results**

This study did not involve the use of an investigational device. Commercially available diagnostic hysteroscopes were used by the Investigators.

**No hysteroscopy-related serious adverse events were reported.** 8% (6/72) of subjects reported one or more gynecologic adverse events. Only one gynecologic adverse event (dysmenorrhea) was reported as “severe” and resolved in two days with no intervention or action taken. The remaining adverse events were comprised of pain, nausea, uterine cramping and/or vaginal spotting, which can be expected following office diagnostic hysteroscopy.

## 10.0 PATIENT SELECTION

Menorrhagia can be caused by a variety of underlying problems, including, but not limited to: endometrial cancer, myomas, polyps, drugs and endometrial ovulatory dysfunction.<sup>4</sup> Patients always should be screened and evaluated to determine the cause of excessive uterine bleeding before any treatment option is initiated. Consult medical literature relative to various endometrial ablation techniques, indications, contraindications, complications and hazards prior to the performance of any endometrial ablation procedure.

## 11.0 PATIENT COUNSELING

As with any procedure, the physician needs to discuss with the patient the risks, benefits and alternatives to endometrial ablation. Patients should be informed that pregnancy is not likely after ablation, but it can happen. If it does, the risk of miscarriage and other problems are greatly increased. If a woman still wants to become pregnant, she should not have this procedure. Women who have endometrial ablation should use birth control until after menopause.<sup>5</sup>

<sup>4</sup> ACOG Practice Bulletin No. 128 July 2012, Diagnosis of Abnormal Uterine Bleeding in Reproductive-Age Women.

<sup>5</sup> <http://www.acog.org/Patients/FAQs/Endometrial-Ablation>



Vaginal discharge is typically experienced during the first few weeks following ablation and may last as long as several weeks. Generally, the discharge is described as bloody during the first few days; serosanguinous (thin, watery discharge, yellow to red in color) by approximately one week; then profuse and watery thereafter. Any unusual or foul-smelling discharge should be reported to the physician immediately. Other post-procedural complications include cramping/pelvic pain, nausea and vomiting.

**Uterine perforation should be considered in the differential diagnosis of any post-operative patient complaining of acute abdominal pain, fever, shortness of breath, dizziness, hypotension or any other symptom that may be associated with uterine perforation with or without damage to the adjacent organs of the abdominal cavity. Patients should be counseled that any such symptoms should be immediately reported to their physician.**

### **Endometrial Thinning of Patient**

The lining of the uterus should be thinned prior to endometrial ablation with the Mara Water Vapor Ablation System. This can be accomplished by timing the menstrual cycle to the early proliferative phase, administering pretreatment drugs such as oral contraceptives, progestin (e.g., Norethindrone Acetate or Provera), or GnRH agonists.

## **Pre- and Post-operative Use of NSAIDs**

It is recommended that a non-steroidal anti-inflammatory drug (NSAID) be given at least one hour prior to treatment and continued post-operatively, as necessary, to reduce intra-operative and post-operative uterine cramping.

## **12.0 CLINICAL USE CHECKLIST**

Prior to use of the Mara Water Vapor Ablation System on a patient, the physician should complete the following checklist to better ensure a safe and effective use of the system. Note that this is not a comprehensive list, but an attempt to cover some of the key issues before a physician uses the Mara Water Vapor Ablation System.

The physician must:

- Along with ancillary personnel, thoroughly read and understand the Instructions For Use, Mara Console Operators Manual, Indications, Contraindications, Warnings, Technical Warnings and Precautions supplied with the Mara Water Vapor Ablation System;
- Be able to maintain proper placement of the Vapor Probe and be able to maintain control of the Water Vapor Probe throughout the procedure;

- Neither advance nor withdraw the Water Vapor Probe into or out of the uterine cavity once the Uterine Cavity Integrity Test and Device Lumen Patency Test have successfully completed and water vapor delivery is initiated, until prompted to remove the Water Vapor Probe from the patient;
- Be aware of appropriate sequence of actions to stop water vapor delivery, resolve and/or continue treatment, in the event the Mara Water Vapor Ablation System stops water vapor delivery during treatment.

## 13.0 HOW SUPPLIED

The Mara Water Vapor Probe Kit is supplied STERILE using an ethylene oxide (EO) process. The Water Vapor Probe is packaged together in a carton containing these Instructions for Use. Store in a cool, dry, dark place. Do not use if package is damaged or opened. See product labeling for expiration date. Do not use product beyond its expiration date.

## 14.0 INSTRUCTIONS FOR USE

Please read all instructions, cautions, and warnings prior to use.

**INSPECT DISPOSABLE DEVICE PACKAGING—DO NOT USE STERILE OR NON-STERILE SINGLE-PATIENT USE DISPOSABLE DEVICES IF THE PACKAGING OR DEVICE APPEARS TO BE DAMAGED OR THERE IS EVIDENCE OF TAMPERING.**

Refer to the Operator's Manual that accompanies the Mara Console for proper set up and use.

### **Set-up**

The following items are required when using the Mara Water Vapor Ablation System:

- One sterile, single-use Mara Water Vapor Probe Kit (includes a sterile Mara Water Vapor Probe with attached saline delivery conduit, syringe and saline supply line with spiked end)
- One Mara Console (with attached Cartridge and Cartridge Cable, and AC power cord)

For proper operation of the system, the following hospital supplies are also required:

- 1L bag of 0.9% Normal Saline—It is recommended that Normal Saline should be supplied at body temperature.

- Patient fluid/waste collection container
- Uterine sound
- 10 inch tenaculum, straight-arm with ratchet
- Speculum

### **Patient Preparation**

1. Prepare the patient for anesthesia.
2. Place the patient in the dorsal lithotomy position, which is the same as for hysteroscopy or other endometrial ablation procedures. Prepare and drape the patient for endometrial ablation.
3. Induce anesthesia according to standard practice.
4. Perform bimanual examination. Evaluate the patient for severe anteversion or retroversion.
5. Grasp the cervix with a tenaculum at the 12 o'clock position.

## **Procedure Preparation (refer to Mara Console Operator's Manual for complete instructions and diagrams)**

1. Place the Console on a steady surface next to the patient within sight of the physician.
2. Attach the power cord to a grounded wall receptacle.
3. Press the Front Panel Power Button to turn on the Mara Console. Verify that the power-on self-test successfully completes.
4. Follow on-screen prompts by the Mara Console.
5. When ready to use the Water Vapor Probe, remove it from its packaging using aseptic technique.
6. Insert the Water Vapor Probe Syringe into the Console through the Syringe Port: press down and then twist clockwise. Syringe will illuminate green to indicate proper insertion.

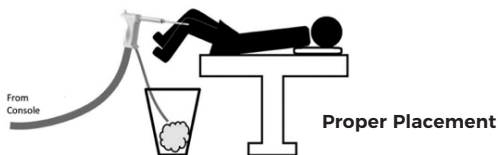


7. Connect the Water Vapor Probe Saline Supply Line to the saline IV bag using the attached spike. Ensure the Saline Supply Hook for the Saline Bag is locked in the upright position and hang the Saline Bag on the Saline Supply Hook.
8. Firmly insert the Cartridge into the Water Vapor Probe Handle until the mechanism clicks.  
**Tip: Momentarily press the Cartridge Release Button at the base of the Water Vapor Probe Handle to facilitate insertion.** Pull down on the Blue Tab at the base of the Water Vapor Probe Handle to pull the sterile Protective Sheath over the Cartridge Cable.



- The on-screen prompt will provide instruction to place the outlet end of the Water Vapor Probe's Outflow Tube in the waste collection container (not provided).

**WARNING:** Place the outlet end of the Water Vapor Probe's Outflow Tube in the waste collection container (not provided) that is intended to collect water vapor outflow. Be sure the distal tip of the Outflow Tube remains in the waste collection container for the remainder of the procedure. Do not place the outlet end of the Outflow Tube into the upper portion of an under-buttock drape due to the risk of severe burn to the patient. Ensure the outlet end of the Outflow Tube is not submerged in fluid at any time during the procedure.





10. Follow the Console on-screen prompts to test the Water Vapor Probe. If the Water Vapor Probe test is unsuccessful, the Console will indicate an alert notification. Follow the on-screen instructions to resolve the issue, or press the red Treatment Interrupt Button to disconnect and replace the Water Vapor Probe. Please refer to the Mara Console Operator's Manual.

**WARNING:** During the Water Vapor Probe Test, the three balloons on the shaft of the Water Vapor Probe will inflate. Visually confirm the inflation of all three balloons. If one of the balloons does not inflate, do not proceed. Press the red Treatment Interrupt Button to disconnect and replace the Water Vapor Probe.

Following the Water Vapor Probe Test, and with the Protective Tip Cover still in place and the three balloons inflated, a short burst of low pressure water vapor will be delivered into the Water Vapor Probe Protective Tip Cover to calibrate the Pressure Sensor on the tip of the Water Vapor Probe. This step will occur automatically following completion of a successful Water Vapor Probe Test—no action is required. The Protective Tip Cover, distal tip of the Vapor Probe and Water Vapor Probe Outflow Tube may feel warm to touch because of the water vapor delivery. If the Pressure Sensor calibration is unsuccessful, the Console will indicate an alert notification. Follow the on-screen instructions to resolve the issue or press the red Treatment

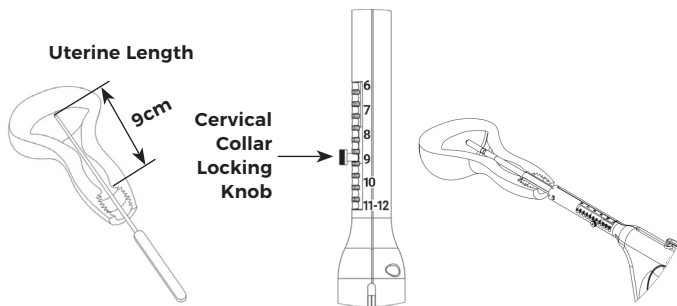
Interrupt Button to disconnect and replace the Water Vapor Probe. Please refer to the Mara Console Operator's Manual.

11. Rotate then gently pull the protective tip cover from the Water Vapor Probe shaft.



12. Insert the speculum, and measure the length of the uterus from the fundus to the external cervical ostium using a uterine sound. Adjust the Cervical Slide Collar on the Water Vapor Probe shaft by aligning the Slide Collar Adjustment Lock with the numbered indicia that corresponds to the measured uterine length. The example below is for the adjustments made for a measured uterine length of 9cm. Adjustments to the Slide Collar Adjustment Lock setting may be made to aid with placing the internal balloon beyond the internal cervical ostium.

**WARNING:** Use caution not to perforate the uterine wall when sounding or inserting the Water Vapor Probe.

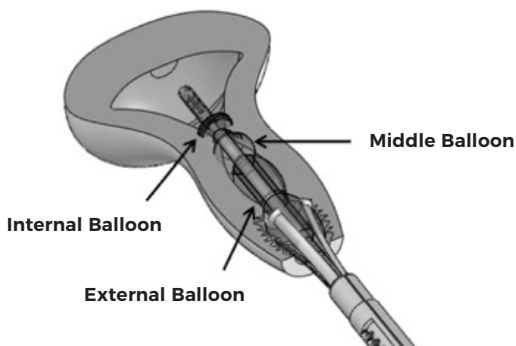


13. Follow the Console on-screen prompts (press the green arrow) to prepare for Water Vapor Probe insertion by starting saline flow. Saline will flow through the Water Vapor Probe and flow out of the Water Vapor Probe tip.
14. Insert the Water Vapor Probe into the uterus until the cervical collar reaches the exo-cervix. Resistance may be felt or advancement of the device may be prevented as the cervical collar touches the exo-cervix.

**NOTE:** If the Water Vapor Probe is difficult to insert into the cervical canal, use clinical judgment to determine whether or not dilation is required.

**WARNING:** If a uterine perforation is suspected, the procedure should be terminated immediately. The patient should be evaluated for perforation prior to discharge.

15. Follow the Console on-screen instructions (press the green arrow) to inflate the internal balloon. Gently pull back the Water Vapor Probe to confirm the internal balloon is seated at the internal cervical ostium.
16. Follow the Console on-screen prompts (press the green arrow) to inflate the external and middle balloons. The cervical slide collar will expand with inflation of the external balloon.



17. It is likely that the device will move caudally until the internal balloon seats at the base of the lower uterine cavity. The Water Vapor Probe position does not need to be (and should not be) adjusted based on this movement.

**NOTE:** At any time until ablation treatment starts, the “Deflate/Return” button on the Console touch screen may be pressed to deflate the balloons for removal and/or reinsertion.

**NOTE:** Do not remove the speculum once the Water Vapor Probe is placed and all three balloons are inflated. Removing the speculum at this point could result in unintended movement of the Water Vapor Probe, which may lead to Integrity Test and Patency Test failures.

18. Place the tenaculum onto the Tenaculum Stabilizer. Slide the Tenaculum Stabilizer post backward until it touches the horizontal ratchet of the tenaculum. Do not push the device forward or engage the post too tightly. Do not move or reposition the tenaculum on the cervix after the Water Vapor Probe has been placed and balloons have been inflated.



19. Rotate the Tenaculum Stabilizer to lock in place. The device is now in position and ready for the Uterine Cavity Integrity Test. Press the green arrow to acknowledge on the console screen that the Tenaculum is in place and ready to proceed.
20. The Uterine Cavity Integrity Test will start. If the Uterine Cavity Integrity Test is unsuccessful, the Console will display a message requiring a re-test before proceeding.
  - Press “Re-test” (green arrow) on the Console touch screen to repeat the test; or
  - Press “Deflate/Return” (orange arrow) to deflate the balloons and remove the device. This will allow the device to be repositioned.
21. Upon successful completion of the Uterine Cavity Integrity Test, the Console will automatically start the Device Lumen Patency Test.
22. If the Device Lumen Patency Test is unsuccessful, the Console will display a message requiring a re-test before proceeding.
  - Press “Re-test” (green arrow) on the Console touch screen to repeat the test sequence. The Uterine Cavity Integrity Test will be repeated prior to repeating the Device Lumen Patency Test; or

- Press “Deflate/Return” (orange arrow) to deflate the balloons and remove the device. This will allow the device to be repositioned. The Uterine Cavity Integrity Test will also be repeated prior to repeating the Device Lumen Patency Test.
23. Upon successful completion of the Uterine Cavity Integrity Test and Device Lumen Patency Test consecutively, the Console will be ready to begin water vapor delivery.
- NOTE:** The Console will not start water vapor delivery until both the Uterine Cavity Integrity Test and Device Lumen Patency Test are successfully completed consecutively. There is no bypass or override of this requirement.
24. Press the “Go” button on the Console touch screen to begin water vapor delivery for endometrial ablation. During treatment, the Console display will show the time remaining for water vapor delivery.
- NOTE:** Dark blue portion of circle denotes water vapor flush time period. There is an audible sound during vapor delivery. The circle will fill in slowly with light blue until vapor delivery is complete. Treatment clock will appear after the flush period.
25. If an alert notification occurs, refer to the instructions on the Console touch screen and/or refer to the Mara Console Operator’s Manual, Section 5: Troubleshooting, Table 2, Alert Codes 101-299 and Table 3, Alert Codes 501-699.

26. Water vapor delivery can be interrupted by pressing the red Treatment Interrupt Button on the front panel of the Console. Once pressed, water vapor delivery will terminate. Once engaged, turn the red Treatment Interrupt Button clockwise to release. Options to proceed are then given on the Console screen. If water vapor delivery was interrupted within the first 20 seconds of water vapor delivery (saline flush period), the procedure may be continued. If the red Treatment Interrupt Button is pressed after the end of saline flush (during the 120 seconds of water vapor treatment), then water vapor delivery will be terminated.
27. Once water vapor treatment has ended, balloons will automatically deflate.
- If water vapor delivery did not complete due to an alert notification or use of the Treatment Interrupt Button during the saline flush period, the procedure can be attempted again with a new Water Vapor Probe.
  - If water vapor delivery did not complete due to an alert notification or use of the Treatment Interrupt Button after the saline flush period, a repeat water vapor delivery must not be attempted in the same operative setting. A repeat ablation has not been studied and the effects are unknown.



28. The Console will display a message to indicate when to remove the Water Vapor Probe. Detach the tenaculum from the Tenaculum Stabilizer and remove the Water Vapor Probe from the uterus. Press the green arrow to proceed.
29. To disconnect the Cartridge from the Water Vapor Probe Handle, gather the Sterile Sheath to expose the Cartridge. While pressing the Cartridge Release Button at the base of the Water Vapor Probe Handle, pull the black Cartridge from the handle to separate. Place Cartridge back into the cradle on the side of the Console.
30. Rotate the Syringe counter-clockwise to disconnect from the Syringe Port. Remove the Syringe from the Syringe Port. Remove the Saline Supply Line and saline bag from the Saline Supply Hook. Dispose per your institution's guidelines.
31. The Console will display a message to shut down. Press the power button to shut down the system.

## 15.0 PARTS LIST ORDERING INFORMATION AND RELATED PARTS AND ACCESSORIES

### Product Number Description

Description	Model Number
Mara Console	GEN-16-050
Mara Water Vapor Probe Kit	DDK-16-050

## 16.0 SERVICE REPRESENTATIVES

Should the Mara Water Vapor Ablation System become inoperable, contact CooperSurgical, Inc. for instructions and a Return Goods Authorization number (RGA#). Clean and repackage the System components and return them to CooperSurgical, Inc. for repair or servicing.

**NOTE:** Any Mara Water Vapor Ablation System-related incident or problem, which is believed to represent a safety issue, should be reported to CooperSurgical, Inc. immediately.

For service, technical support or reorder information, contact:

### **CooperSurgical, Inc.**

95 Corporate Drive  
Trumbull, CT 06611  
USA

Phone: (800) 243-2974

Fax: (800) 262-0105

## 17.0 SYMBOLS KEY



Caution



Refer to Instruction Manual/Booklet



Lot Number



Catalog Number



Serial Number



Do Not Reuse



Sterilized by ETO



Non-Sterile



Use by Date



Date of Manufacture



Manufacturer



Power On/Off



Alternating Current



Shock Protection Type B



Protective Earth Terminal



Temperature Limit



Humidity Limitation



Atmospheric Pressure Limitation



Consult Instructions for Use



Do Not Use if Package is Damaged



Keep Away from Sunlight



Keep Dry



Do Not Dispose



Outflow Conduit Warning

**CAUTION**

**Hot! Do not place on patient**

**IP21**

Protects persons against access to hazardous parts with fingers; protection against vertically falling water drops

## **18.0 WARRANTY INFORMATION**

CooperSurgical, Inc. warrants that the device(s) supplied is free from defects in materials or workmanship. This warranty is valid only if the product is supplied to the end user by a CooperSurgical, Inc. approved agent or distributor and has been maintained in accordance with procedures documented in the IFU. If failure occurs from manufacturing defects within 12 months of purchase, CooperSurgical, Inc. will repair or replace defective item.



The Mara™ Water Vapor Probe is manufactured by CooperSurgical, Inc.  
The Mara™ Console is manufactured for CooperSurgical, Inc.  
CooperSurgical is a registered trademark of CooperSurgical, Inc.  
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