

# Single-Visit Approach to Cervical Cancer Prevention

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## Clinical Standards of Practice and Counseling Guide

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## Acronyms

CDC	Centers for Disease and Control
CO <sub>2</sub>	Carbon dioxide
HPV	Human papillomavirus
IUD	Intrauterine device
LEEP	Loop Electrosurgical Excision Procedure
SCJ	Squamocolumnar junction
SOP	Standards of practice
SPIRES	Stanford University Program for International Reproductive Education and Services
STI	Sexually transmitted infection
SVA	Single-visit approach
VIA	Visual inspection with acetic acid
VILI	Visual inspection with Lugo's iodine

# Single-Visit Approach to Cervical Cancer Prevention

## Clinical Standards of Practice and Counseling Guide

### Introduction

The single-visit approach (SVA) to cervical cancer prevention (also referred to as the “See-and-Treat” approach) currently involves visual inspection of the cervix with acetic acid wash (VIA) and treatment of precancerous lesions with cryotherapy. Pathfinder International’s Clinical Standards of Practice (SOP) and Counseling Guide is designed to be used by physicians, nurses, midwives, and health officers who provide cervical cancer prevention services using the single-visit approach. The Clinical SOPs and Counseling Guide are in alignment with international standards of care for the SVA and aim to standardize quality of care among participating health care providers and their affiliated health facilities.

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## I. VIA SCREENING TEST

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### A. Background Content for Provider

#### 1. The natural history of cervical cancer and HPV infection

- The cervix is the lower end of the uterus that protrudes into the upper end of the vagina.
- The cells on the outside of the cervix are squamous mucosa. The cells on the inside of the cervix are glandular (columnar) mucosa and are responsible for the production of mucus. Cervical cancers tend to occur where the two cell types mix; we call this the transformation zone. Cancers can come from the squamous or the glandular cells. The majority of squamous cell cervical cancers originate in the squamous component of the cervix.
- The main cause of cervical cancer is the human papillomavirus (HPV). HPVs are a group of more than 100 related viruses. More than 30 subtypes are genital-area specific.<sup>1</sup>
- Most women get infected with HPV at least once in their lifetime. Usually women contract HPV during adolescence with peak infection coinciding with the onset of sexual activity.<sup>2</sup> Most HPV infections occur without any symptoms and go away without any treatment over the course of a few months to a few years.
- However, two types of HPV (HPV-16 and HPV-18) are responsible for about 70% of the cases of cervical cancer worldwide. Persistent over time, these HPV infections produce abnormal changes in the cells of the cervix.
- According to data from cancer registries in developing countries, 80-90% of confirmed cervical cases occur among women aged  $\geq 35$ . Incidence increases around ages 35-40 and reaches a maximum in women in their 50-60s.<sup>3</sup> In low-income countries like Ethiopia, cervical cancer is a leading cause of cancer-related deaths among women.
- Immunocompromised women, such as HIV-positive women, are more easily infected with high-risk HPV types 16 and 18, more likely to develop precancerous lesions, and more vulnerable to rapid development and persistence of these lesions than HIV-negative women. However, HIV-positive women with a CD4 count above 400 are more likely to eliminate the virus spontaneously or respond to treatment.
- Early cervical cancers usually do not have symptoms. When women present with symptoms such as abnormal vaginal bleeding (e.g., bleeding that occurs between regular menstrual periods or bleeding after sexual intercourse)<sup>3</sup> or lower abdominal pain, this means the cancer is at an advanced stage and treatment options in low-resource settings are few and have limited benefits.
- If abnormal cells/precancerous lesions are found early, cervical cancer can be prevented by removing the changed cells/lesions before they can become cancer cells.

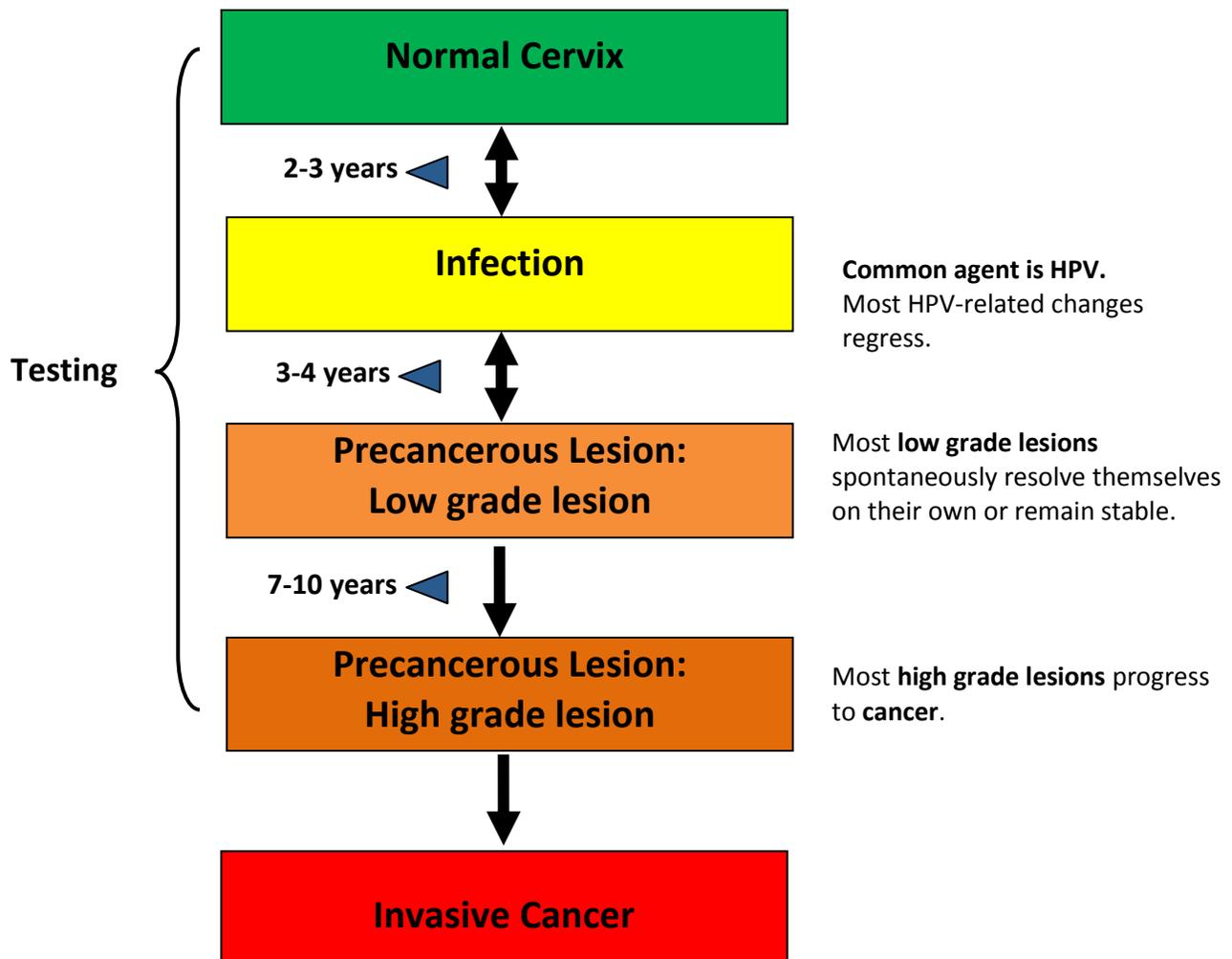
<sup>1</sup> National Cancer Institute. Retrieved from: <http://www.cancer.gov/cancertopics/factsheet/Risk/HPV>.

<sup>2</sup> RHO Cervical Cancer. Retrieved from: <http://www.rho.org/about-cervical-cancer.htm#fig2>.

<sup>3</sup> Population Reference Bureau & ACCP. (2004). Preventing cervical cancer worldwide. Washington, DC; Seattle, WA: Population Reference Bureau. Retrieved from: [www.prb.org/pdf05/PreventCervCancer\\_Eng.pdf](http://www.prb.org/pdf05/PreventCervCancer_Eng.pdf).

- Cervical cancer can be easily prevented with a simple test called VIA followed by treatment of abnormal cells/precancerous lesions. The VIA test identifies abnormal cells/precancerous lesions at a stage when it is possible to treat before it develops into cancer.
- If not diagnosed and/or treated, the precancerous cells can become cancerous and potentially spread beyond the cervix and pelvic organs.<sup>4</sup> Without early diagnosis and treatment, cervical cancer can lead to death.
- THEREFORE, CERVICAL CANCER CAN AND SHOULD BE PREVENTED!

## 2. Diagram 1. Natural history of cervical cancer



## 3. Cervical cancer risk factors

The main cause of cervical cancer is HPV. HPV infection combined with other risk factors may further increase risk. Other risk factors for cervical cancer include:

<sup>4</sup> WHO. (2006). Comprehensive cervical cancer control: A guide to essential practice. Geneva: WHO.

- Sexual history: Women who have had many sexual partners have a higher risk of developing cervical cancer. Also, a woman who has had intercourse with a man who has had many sexual partners may be at higher risk of developing cervical cancer. In both cases, the risk of developing cervical cancer is higher because these women have a higher risk of HPV infection.<sup>5</sup>
- Multi-parity: The risk of cervical cancer increases with higher parity.<sup>3</sup>
- Weakened immune system: Infection with HIV or taking drugs that suppress the immune system increase the risk of cervical cancer.
- Smoking: Smoking increases the risk of cervical cancer.<sup>3</sup>
- Inconsistent or lack of testing: Cervical cancer is more common among women who do not have regular screening tests.<sup>3</sup>
- Family history of cervical cancer: Cervical cancer may run in some families. If a woman's mother or sister had cervical cancer, her chances of developing the disease are 2 to 3 times higher than if no one in the family had it.<sup>6</sup>

#### 4. Primary vs. Secondary Prevention

- Primary prevention: The goal of primary prevention is to prevent infection by reducing or eliminating exposure to cancer-causing factors. Primary prevention of cervical cancer includes delay of intercourse, condom use, monogamy, and HPV vaccines (Gardasil® and Cervarix®).
- Secondary prevention (screening/testing with precancer treatment): Screening involves checking for disease when there are no symptoms. Progression of precancerous conditions to cervical cancer is slow, therefore screening has the potential to detect abnormal conditions before cancer develops. Screening tests for cervical cancer includes conventional or liquid-based cytology (Pap smear), HPV DNA testing, and VIA with or without Lugol's Iodine (VILI).

#### 5. General description of the VIA test

- VIA involves naked-eye inspection (i.e., without magnification) of the cervix to detect abnormalities after applying a dilute solution of acetic acid, which is commonly found in household vinegar.
- The acetic acid interacts with diseased cells, causing epithelial lesions to turn white. This reaction is referred to as an "acetowhite" change.

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<sup>5</sup> National Cancer Institute. Retrieved from: <http://www.cancer.gov/cancertopics/wyntk/cervix/page4> .

<sup>6</sup> American Cancer Society. Retrieved from: <http://www.cancer.org/cancer/cervicalcancer/detailedguide/cervical-cancer-risk-factors>.

## 6. Eligibility criteria

- Women who are 30-45 years old and not menopausal are eligible for the VIA test.
- HIV-positive and HIV-negative women are eligible to be tested with VIA.
- Refer to Appendix 1: Cervical Cancer Prevention Flow Diagram for Service Provision for additional eligibility information.

## 7. Benefits of the VIA test

- The VIA test identifies abnormal cells/precancerous lesions at a stage when it is possible to treat it before it develops into cancer. Finding and treating abnormal cells can prevent most cervical cancers.
- Is relatively simple, inexpensive, and requires minimal equipment.
- Results from the VIA test are available immediately, which allows for provision of immediate treatment (e.g., cryotherapy—a procedure that eliminates precancerous lesions on the cervix by freezing them) or referral for other treatment options.
- A wide range of personnel can perform the VIA test after training.
- The VIA test has comparable or higher sensitivity than cytology (the proportion of true positives that are identified as positives).

## 8. Risks of not being tested for precancerous lesions

- Persistent, high-risk oncogenic HPV infection and precancerous lesions that are not diagnosed and treated will eventually become cancerous.

## 9. Test results and management options

**Reminder to Provider:** Refer to Appendix 1 for additional information on test results and management options.

### a. Negative VIA test

Findings: Smooth, pink, uniform and featureless cervix; cervical ectropion; polyp; cervicitis; inflammation; and/or nabothian cyst.

Treatment: Treatment is not needed. The woman will probably not have increased risk of cervical cancer in the next 5 years. Therefore, recommend that she return in 5 years for re-testing.

### b. Positive VIA test and eligible for cryotherapy

Findings: The VIA test showed acetowhite lesions that may be precancerous. The findings showed raised and thickened white plaques or acetowhite epithelium, usually near the squamocolumnar junction (SCJ); acetowhite lesion <75% of cervix; lesion does not extend onto the vaginal wall; and lesion extends <2 mm beyond the diameter of the cryoprobe.

Treatment: Treat with cryotherapy.

**c. Positive VIA test and ineligible for cryotherapy**

Findings: the VIA test detected acetowhite lesions that cannot be treated with cryotherapy. The findings showed raised and thickened white plaques or acetowhite epithelium, usually near the SCJ; acetowhite lesion >75% of cervix; lesion extends into the vaginal wall; and lesion extends >2mm beyond the diameter of the cryotip.

Treatment: Provide the woman with a referral for further evaluation and appropriate management from a doctor who might have access to other forms of treatment such as Loop Electrosurgical Excision Procedure (LEEP), conization biopsy, or hysterectomy.

**d. Suspicious for cancer**

Findings: Cauliflower-like growth or ulcer; fungating mass. Lesion is suspicious for cancer and appears to have moved beyond precancerous stage.

Treatment: Cryotherapy cannot be used to treat suspicious cervical lesion(s). Refer the woman to seek further evaluation as soon as possible for diagnosis and appropriate treatment.

## B. Counseling Guidelines for the VIA Test

### 1. General counseling guidelines for the VIA test

Counseling women prior, during, and after performing the VIA (screening) test alleviates anxiety, fear, and misunderstandings regarding the test, and ensures that the woman consents to the procedure according to her own free will and with a full understanding of it. Counseling on the VIA test includes discussing the following topics:

- a. Description of the cervix,
- b. Description of what cervical cancer is,
- c. The importance of testing,
- d. Description of the VIA test (including the steps you will perform before you performing them), and
- e. VIA test results, treatment options, and follow-up.

When counseling women, make sure you:

- Explain the information in detail, in a non-threatening manner, and in language the woman understands.
- To ensure confidentiality, share the woman’s information with her companion(s) and/or other clinic staff only if she gives consent.
- Allow the woman time to consult with family members if she needs to.
- Allow the woman to have someone in the room only if she gives consent.
- Allow time for discussion; encourage the woman to ask questions and discuss her condition.
- After you have provided counseling and information on VIA and the woman has no more questions or concerns, ask her if she gives consent for VIA testing.

### 2. Suggested counseling language for providers

#### a. *What is the cervix?*

- The cervix is the bottom, narrow end of the uterus that forms a canal between the uterus and vagina.
- It can be seen with the naked eye using a visualizing device (speculum) and a good light source.
- It is part of the body that must dilate (widen) in order for a baby to be born.

#### b. *What is the cervical cancer?*

- Cervical cancer starts with a virus called “HPV” (human papillomavirus)—an infection that cannot be seen with the naked eye and often occurs without presenting any symptoms.
- Cervical cancer is a serious disease, but it takes a long time to develop. Because it takes a long time for cervical cancer to develop, it can be prevented and treated if diagnosed early or before the cancer actually begins (at a precancer stage).

- Every woman of reproductive age who has had sex is at risk of being infected with HPV. Other risk factors for cervical cancer include a weakened immune system, multiple sexual partners, early age at first intercourse, sexually transmitted infections (STIs), and cigarette smoking.
- If an HPV infection persists for a long period of time, it can lead to cervical cancer.
- Early cervical cancer usually does not have symptoms.
- When the cancer is at an advanced stage, it can present in symptoms such as abnormal vaginal bleeding, foul smelling vaginal discharge, or lower abdominal pain.
- Cervical cancer is a leading cause of cancer death among women in many other low-resource settings.
- Cervical cancer is more common in women over 40 years of age.

**c. What is the VIA test?**

- Cervical cancer can be easily prevented with a simple test called VIA. The VIA test identifies precancerous lesions at a time when it is possible to treat before it develops into cancer. The procedure is usually painless and the results are provided immediately.
- The VIA test will involve the following steps:
  - Step 1: I will first inspect and palpate the abdomen and external genitalia.
  - Step 2: I will use a simple instrument (speculum) to open your vagina to allow me to see the cervix clearly. You may feel slight pressure from the speculum.
  - Step 3: Once I can see your cervix clearly, I will wash the cervix with a water-like solution (vinegar). The vinegar may feel cold when it is applied. The vinegar allows me to see the difference between a cervix that looks healthy and one that is abnormal.
  - Step 4: The vinegar turns precancerous lesions white after 1 minute.
  - Step 5: I will remove the instrument (speculum) and then we will discuss the results.

**d. What will the VIA test show? What are the treatment options?**

- If the VIA test is negative: this means that there are no visible precancerous lesions in your cervix. It is unlikely that you will develop cervical cancer in the next 5 years. We will ask you to return to be re-tested in 5 years.
- If the VIA test is positive and you are eligible for cryotherapy: this means that the test shows a precancerous lesion and it is small (as in 90%—90 out of 100—of cases). It can easily be treated immediately with cryotherapy (freezing and removing the growing abnormal lesions).
- If the VIA test is positive and you are ineligible for cryotherapy: this means that the test shows a precancerous lesion that is too large to be treated by cryotherapy. However, there are other treatment options such as LEEP or Conization. Both of these treatments involve removing just the diseased part of the cervix. If the lesion can be treated with LEEP and LEEP is available in the hospital, you will receive this treatment

at the hospital (outside referral is not necessary). If the lesion cannot be treated with LEEP or if it's difficult for you to go to the hospital where LEEP service is provided, hysterectomy is the last option. [The health care provider will give the appropriate referral.]

- If the VIA test shows lesions that are suspicious for cancer: this means that we cannot treat with cryotherapy. To find out exactly what the diagnosis is and give you the appropriate treatment, we strongly suggest that you seek further evaluation as soon as possible. I will provide you with a referral so you can receive further evaluation and appropriate care. The earlier the problem is known and appropriate treatment given, the better the treatment outcome will be. If the lesion is found to have reached the cancer stage, delay in seeking care would lead to progression of the disease and bad outcomes, such as development of advanced cervical cancer which could be difficult to treat. If it is found to be something other than cancer, you will receive appropriate treatment from a doctor.

***e. What are the risks of not being tested for precancerous lesions?***

- If a precancerous lesion that may have been there for a long time is not diagnosed and treated, there is a significant likelihood that it will eventually become cancerous.

## C. Guidelines for the VIA Test Procedure

### 1. General description of VIA test

- VIA involves a standard speculum exam followed by visual inspection of the cervix 1 minute after washing it with a 3-5% acetic acid solution (ordinary table vinegar) using a cotton swab.
- The acetic acid solution shows any changes in the cells covering the cervix (epithelial cells) by producing the “acetowhite” reaction (white blotches). This allows the provider to identify if the woman has abnormal, precancerous cells to treat immediately with cryotherapy or refer her to further treatment if necessary.

### 2. Diagram 2. VIA steps involved in the SVA procedure

Refer to the first section (steps 1-6) for the VIA steps involved in the SVA procedure. More specific instructions on how to perform each VIA step are provided below.

VIA TEST	Step 1:	Provide counseling on VIA test and obtain consent.
	Step 2:	Inspect and palpate the abdomen and external genitalia.
	Step 3:	Perform a speculum exam to view the cervix clearly.
	Step 4:	Apply a 3-5% acetic acid solution (vinegar) to the cervix.
	Step 5:	Observe for cervical change(s) after at least 1 minute.
	Step 6:	Discuss the results with the woman. If the results are positive and eligible for cryotherapy, offer and counsel on cryotherapy.
CRYOTHERAPY	Step 7:	Provide counseling on cryotherapy and obtain consent.
	Step 8:	Perform a speculum exam to view the cervix again (repeat VIA if necessary).
	Step 9:	Perform the double-freeze technique.
	Step 10:	Provide post-treatment and follow-up instructions to the woman.

### 3. Pre-procedure preparations

- 3.1 Discuss the need for VIA, the procedure, likely findings, and its management and follow-up options with the woman (See Section B. Counseling Guidelines for the VIA Test).
- 3.2 Confirm that the woman is eligible for VIA (30-45 years old and not menopausal). (Refer to Appendix 1 for additional information on eligibility for VIA testing.)
- 3.3 Make sure that you have all necessary instruments and supplies required for VIA testing:
  - Light source
  - Instrument tray
  - Bivalve speculums (of different sizes)
  - Cotton swabs or cotton wool plus forceps
  - New examination gloves or high-level disinfected surgical gloves
  - Diluted (3-5%) acetic acid solution
  - 0.5% chlorine solution
  - Buckets with chlorine solution
  - Clock/watch
  - Record forms (e.g., VIA register, VIA client assessment form, etc.)
- 3.4 Arrange instruments and supplies on high-level disinfected tray or container.
- 3.5 Ask the woman to empty her bladder (if she has not done so in the last half hour) and verify that she has thoroughly washed and rinsed her abdominal and genital areas. (Make sure this happens in your clinic before the woman is brought into the examination room).
- 3.6 Help the woman lie down on the examination table and place her heels in the stirrups or footrests. Ask her to move toward the end of the examination table until her buttocks extend slightly beyond the edge of the table. Then ask her to let her knees fall apart and to relax her buttocks. If there are no stirrups, help place her feet on the outside edge of the end of the table and place her buttocks close enough to her feet so that her knees bend upward and fall open comfortably. If she prefers, cover her knees with the drape. The drape can also be placed flat across her abdomen so that you can make eye contact with her and she can see what you are doing.
- 3.7 Wash your hands thoroughly with soap and water and dry them with a clean, dry cloth/towel or air dry. Avoid sharing cloths/towels to ensure proper infection prevention.
- 3.8 After your hands are washed and dried appropriately, perform lower abdomen and groin examination.
- 3.9 Point your light source toward the vagina.
- 3.10 Put new examination or high-level disinfected surgical gloves on both hands.
- 3.11 Seat yourself comfortably so that you are as relaxed as possible and can look at the external genitalia easily.

#### 4. Performing the VIA test

**Reminder to Provider:** inform the woman about each of the following steps you will perform while performing them.

- 4.1 Touch the inside of her thigh gently before touching any of the genital area so that you do not startle her.
- 4.2 Inspect the external genitalia and check the urethral opening for discharge. Palpate the Skene's and Bartholin's glands.
- 4.3 Inform the woman that the speculum is about to be inserted and that she may feel some pressure.
- 4.4 Gently insert the speculum fully or until resistance is felt and slowly open and fix the blades to clearly reveal the cervix.
- 4.5 Move the light source so that cervix can be seen clearly.
- 4.6 Check the cervix for cervicitis, ectropion (ectopy), tumors, nabothian cysts, and ulcers.
- 4.7 Use a clean cotton swab to remove any discharge, blood, or mucus from the cervix and dispose of it in a leak-proof container or plastic bag.
- 4.8 Identify the cervical os and the squamocolumnar junction (SCJ).
- 4.9 Soak a clean swab in dilute acetic acid solution; apply it to the cervix; and dispose of swab.
- 4.10 Wait at least 1 minute for the acetic acid to be absorbed and for any acetowhite reaction to appear.
- 4.11 Check if the cervix bleeds easily. Look for any raised and thickened white plaques or acetowhite epithelium. Precancerous lesions are likely to appear thickened, slightly raised, and opaque. They have a fairly clear margin/border and will usually originate at or very near the SCJ.
- 4.12 When visual inspection of the cervix has been completed, use a fresh cotton swab to remove any remaining acetic acid from the cervix and vagina.
- 4.13 Gently remove the speculum and place it in 0.5% chlorine solution for 10 minutes for decontamination.
- 4.14 Perform a bimanual examination and a recto vaginal examination (if indicated).

#### 5. Post-VIA tasks

- 5.1 Wipe the light source with 0.5% chlorine solution or alcohol to avoid cross-contamination.
- 5.2 Immerse both gloved hands in 0.5% chlorine solution and remove gloves by turning them inside out.
- 5.3 Wash your hands thoroughly with soap and water and dry them with a clean, dry cloth/towel or air dry. Avoid sharing cloths/towels to ensure proper infection prevention.
- 5.4 Ask the woman to move toward the head of the table and assist her to sit up. Ask her to get dressed.
- 5.5 Wipe down the table with a bleach solution after the women gets off the examining table
- 5.6 Record the VIA test results and other findings in the records/chart and register.

- 5.7 Discuss the results of pelvic examination and VIA test with the woman. (See Section C6 for classification of pelvic exam results; see section C7 for classification of VIA test results.)

## 6. Pelvic examination results

Inform the woman of the results of the pelvic examination according to the following categories:

- a. Lower abdomen  
No abnormal findings; or abnormal masses such as bumps, swollen lymph nodes (buboes), signs of previous surgeries (scars), and tenderness or guarding.
- b. Groin  
No abnormal findings; or tenderness, swollen lymph nodes (buboes), open sores, or other evidence of STIs.
- c. External genitalia  
No abnormal findings; or lice, tenderness, lumps, swelling, sores, tears, scars, urethral discharge, or discharge from Bartholin's and Skene's glands.
- d. Internal genitalia  
No abnormal findings; or vaginal or cervical discharge, cervicitis and other abnormalities of the cervix, STIs, and/or other lesions.

## 7. VIA test results

**Reminder to Provider:** If the woman has cervicitis or inflammation and is eligible for cryotherapy, it is preferred that she is treated with antibiotics first, waits 2 weeks, and then is treated with cryotherapy. However, if she cannot return to the facility within 2 weeks, you can give her antibiotic therapy and offer cryotherapy immediately.

**Reminder to Provider:** Refer to Appendix 1 for additional information on test results and management options.

### a. Negative VIA test

Findings: Smooth, pink, uniform, and featureless cervix; cervical ectropion; polyp; cervicitis; inflammation; and/or nabothian cyst.

Treatment: Treatment is not required as there were no acetowhite lesions in the woman's cervix. The woman will probably not get cervical cancer in the next 5 years. Therefore, the recommendation is for the woman to return in 5 years for re-testing.

### b. Positive VIA test and eligible for cryotherapy

Findings: Raised and thickened white plaques or acetowhite epithelium, usually near the SCJ; acetowhite lesion <75% of cervix; lesion does not extend onto the vaginal wall; and/or lesion extends <2 mm beyond the diameter of the cryotip.

Treatment: Treat the acetowhite lesions with cryotherapy.

**c. Positive VIA test and ineligible for cryotherapy**

**Findings:** Raised and thickened white plaques or acetowhite epithelium, usually near the SCJ; acetowhite lesion >75% of cervix; lesion extends into the vaginal wall; and lesion extends >2mm beyond the diameter of the cryotip.

**Treatment:** The VIA test detected acetowhite lesions that cannot be treated with cryotherapy. Therefore, the woman will require further evaluation by a doctor. Provide her with a referral for her to receive further evaluation and appropriate management

If the lesion is treatable with LEEP (as confirmed by a doctor):

1. The woman will get this treatment right here (for hospitals that have LEEP services)
2. She will be referred to nearby hospital for LEEP service (for hospital that do not have LEEP services)

If the lesion can't be treated with LEEP, the doctor will decide if the woman needs further investigation or alternative treatment such as hysterectomy.

**Reminder to Provider:** If the woman has cervicitis or inflammation, it is preferred that she is treated with antibiotics while providing her referral.

**d. Suspicion of cancer**

**Findings:** Cauliflower-like growth or ulcer; fungating mass. Lesion has moved beyond precancerous stage and is suspicious for cancer.

**Treatment:** The test detected an abnormal lesion that cannot be treated with cryotherapy. To find out exactly what the diagnosis is and for the women to receive appropriate treatment, provide the woman with a referral and recommend that she seeks further evaluation as soon as possible.

**Reminder to Provider:** Make sure you have the appropriate referral information. If the woman has cervicitis or inflammation, it is preferred that she is treated with antibiotics while providing referral and then appropriately treated by a doctor.

## II. CRYOTHERAPY OF PRECANCEROUS LESIONS

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### A. Background Content for Provider

#### 1. General description of the cryotherapy procedure

- Cryotherapy is a procedure that eliminates precancerous lesions on the cervix by freezing them.
- Cryotherapy involves applying a highly cooled metal disc (cryotip or cryoprobe) to the cervix and freezing its surface using carbon dioxide gas or nitrous oxide gas as the coolant.
- The treatment consists of applying the coolant continuously for 3 minutes, allowing the abnormal cervical lesion(s) to thaw for 5 minutes, and the reapplying the coolant for another 3 minutes. This procedure is called the “double-freeze” technique and does not require anesthesia.
- After treatment, almost the entire cervix will appear frozen and white, creating an “ice ball.” This will gradually thaw, producing a watery discharge that may last for several weeks.
- Color will return to the tissue but it will remain fragile, requiring a few weeks to heal.
- Once the abnormal cells are removed, they fall off the cervix and new, healthy cells grow back.
- Cryotherapy is a simple and inexpensive procedure. It can be completed in less than 30 minutes.
- It is an outpatient procedure (there is no need for anesthesia or any premedication) and can be performed by a nurse, physician, or other trained and competent health worker.

#### 2. Eligibility criteria

**Reminder to Provider:** Refer to Appendix 1 for additional information on eligibility criteria for cryotherapy.

- Cryotherapy should be offered to a woman if an acetowhite lesion was observed during the VIA test and she meets eligibility criteria. Eligibility criteria for cryotherapy include:
  - Acetowhite lesion occupying <75% of surface of the cervix,
  - Lesion does not extend onto the vaginal wall beyond the cervix, and
  - Lesion extends <2 mm beyond the diameter of the cryotip ; lesion should not extend more than 2 mm into the canal.

#### 3. Potential risks

- There are no serious risks associated with cryotherapy. It is a safe procedure, with low risk of major complications.<sup>7</sup>

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<sup>7</sup> ACCP. (Jan. 2003). Effectiveness, safety, and acceptability of cryotherapy: A systematic review. Seattle, WA: PATH.

- Many women will experience a cold feeling in their vagina and lower abdomen during the procedure and some women could experience mild cramping during the procedure and for 2-3 days after the procedure.

#### **4. Benefits**

- Cryotherapy reduces the chances of cervical cancer.
- Cryotherapy removes abnormal cells and promotes the growth of new healthy cells on the cervix.
- Cryotherapy does not have a long-term impact on women's fertility or pregnancy outcomes.<sup>8</sup>

#### **5. What a woman can expect after being treated with cryotherapy**

- All women will experience watery vaginal discharge for 4–6 weeks.
- Some women will experience cramping and spotting/light bleeding.
- Women will have to be responsible for self-care at home, which includes avoiding internal douching, avoiding use of vaginal tampons, and abstaining from sexual intercourse, or using condoms during intercourse if abstinence is not possible for 4 weeks.
- If a woman experiences mild pain, she can take any analgesics
- If a woman experiences any of the below, she should return to a facility:
  - Fever for more than 2 days
  - Severe lower abdominal pain, especially if accompanied by fever
  - Bleeding for more than 2 days that is heavier than her heaviest days of menstrual bleeding
  - Bleeding with clots
  - Vaginal discharge with foul smell

#### **6. Likelihood of success**

- Cryotherapy is about 90% effective in curing abnormal cervical lesions. This means that out of 100 women with abnormal cervical cells who are treated with cryotherapy, about 90 of them will be cured. The remaining 10 may need a second cryotherapy treatment after 1 year, or they may need further investigation and management depending on the extent of the lesion.

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<sup>8</sup> World Health Organization. (2011). WHO Guidelines: Use of cryotherapy for cervical intraepithelial neoplasia. Geneva: WHO Department of Reproductive Health and Research.

## B. Counseling Guidelines for Cryotherapy

### 1. General counseling guidelines

Cryotherapy should be offered only if the woman meets the eligibility criteria (refer to Appendix 1). (If the woman is not eligible for cryotherapy, see Section III, Alternative Treatments.) All women have a right to make informed decisions freely whether or not to receive treatment. If the woman is eligible, it is essential that she is informed and counseled on the following:

- a. What the cryotherapy procedure is,
- b. Benefits of the procedure,
- c. Potential risks,
- d. Post-treatment care and follow-up, and
- e. Likelihood of success.

This information can alleviate any anxiety, fear, and misunderstandings regarding cryotherapy and ensures that the woman consents to the procedure according to her own free will and with a full understanding of it.

- Explain in detail, in a non-threatening manner, and in language the woman understands.
- To ensure confidentiality, share the woman's information with her companion(s) and/or other clinic staff only if she provides consent.
- Provide additional sexual and reproductive health information (e.g., other STIs, contraception, HIV and AIDS services, etc.) and available services.
- Allow time for discussion; encourage the woman to ask questions and discuss her condition.
- After you have provided counseling and information on cryotherapy and the woman: does not have any more questions or concerns; believes she will be able to abstain from sexual intercourse or use a condom during intercourse; and believes she can do self-care post-treatment, ask her if she gives consent for cryotherapy treatment.

### 2. Suggested counseling language for provider:

#### a. *What is the cryotherapy procedure?*

- Your VIA test showed abnormal cervical tissue that can be removed with a procedure called cryotherapy.
- Cryotherapy is a procedure that is used to remove abnormal cervical tissue from the cervix.
- Once the abnormal cells are removed, they fall off the cervix, and new, healthy cells grow back.
- It takes a short time.
- During the cryotherapy procedure you will hear a hissing noise, but it is nothing to be worried about.
- Cryotherapy only involves removing abnormal cervical tissue. It will not be used for treatment or removal of any other internal or external female genitalia.

**b. What are the potential risks?**

- There are no serious risks associated with cryotherapy. It is a safe procedure, with very low risk of serious complications.<sup>9</sup>
- Many women will experience a cold feeling in their vaginas and lower abdomens during the procedure and some women could experience mild cramping (like menstrual cramps) during the procedure. This is common and does not require hospitalization.

**c. What are the benefits?**

- Cryotherapy reduces the chances of cervical cancer.
- Cryotherapy removes abnormal cells and promotes the growth of new healthy cells on the cervix.
- Cryotherapy does not require hospitalization, anesthesia, or premedication and can be completed in less than 30 minutes.
- Cryotherapy does not have a long-term impact on women's fertility or pregnancy outcomes.

**d. What to expect after being treated with cryotherapy**

- You will have watery vaginal discharge that lasts for 4–6 weeks.
- You may or may not have lower abdominal cramping and spotting/light bleeding.
- You are strongly advised to avoid sexual intercourse for about 1 month until the wound heals. If this is not possible, use a condom.

**e. Details for self-care at home**

- Self-care at home involves avoiding: internal douching, use of vaginal tampons; and sexual intercourse (or use of condom if abstinence is not possible).
- If you experience mild pain, you can take any analgesics.

**f. Conditions that require coming to the clinic as soon as possible for care (outside of scheduled visits)**

**If you have any of the following, you should return to this facility or the nearest health facility:**

- Fever for more than 2 days
- Severe lower abdominal pain, especially if accompanied by fever
- Bleeding for more than 2 days that is heavier than your heaviest days of menstrual bleeding
- Bleeding with clots

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<sup>9</sup> McClung EC, Blumenthal PD. (2012). Efficacy, safety, acceptability and affordability of cryotherapy: a review of current literature. *Minerva Ginecologica*, 64(5):1-23.

- Vaginal discharge with foul smell
- g. Abstinence from sexual intercourse**
- To allow proper healing after cryotherapy treatment and reduce increased transmission of HIV (other types or resistant strains of the virus for HIV-positive women), it is essential that you abstain from sexual intercourse for 4 weeks following treatment.
  - We will supply you with condoms in case total abstinence is not possible for this time period.
- h. Date of next scheduled visit**
- Provide the woman with her next scheduled visit date (at 1 year post last visit) and location.
- i. Post-cryotherapy prepackaged set**
- A post-cryotherapy prepackaged set should contain a set of sanitary pads, a post-cryotherapy information sheet, and a set of condoms (if she has no objection) to take with her.



## C. Guidelines for Cryotherapy Procedure

### 1. General description of the cryotherapy procedure

- Cryotherapy involves applying a cryoprobe to the cervix and freezing its surface using carbon dioxide gas as the coolant.
- The double-freeze technique involves applying the coolant continuously for 3 minutes, allowing the abnormal lesion(s) to thaw for 5 minutes, and the reapplying the coolant for another 3 minutes.
- After treatment, almost the entire cervix will appear frozen and white, creating an “ice ball.” This will gradually thaw, producing a watery discharge that may last for several weeks.
- Cryotherapy is an outpatient procedure and does not require anesthesia or any premedication.
- Cryotherapy can be performed by a nurse, physician, or other trained competent medical professional skilled in pelvic examination and trained in performing cryotherapy.

### 2. Diagram 3. Cryotherapy steps involved in the SVA procedure

Refer to the second section (steps 7-10) for the cryotherapy procedure steps involved in the SVA procedure. More specific instructions on how to perform each cryotherapy step are provided below.

VIA TEST	Step 1:	Provide counseling on VIA test and obtain consent.
	Step 2:	Inspect and palpate the abdomen and external genitalia.
	Step 3:	Perform a speculum exam to view the cervix clearly.
	Step 4:	Apply a 3-5% acetic acid solution (vinegar) to the cervix.
	Step 5:	Observe for cervical change(s) after at least 1 minute.
	Step 6:	Discuss the results with the woman. If the results are positive and eligible for cryotherapy, offer and counsel on cryotherapy.
CRYOTHERAPY	Step 7:	Provide counseling on cryotherapy and obtain written consent.
	Step 8:	Perform a speculum exam to view the cervix again (repeat VIA if necessary).
	Step 9:	Perform the double-freeze technique.
	Step 10:	Provide post-treatment and follow-up instructions to the woman.

### 3. Pre-procedure preparations

- 3.1 Prior to performing cryotherapy, explain why treatment is recommended and the procedure (See Section IIB. Counseling Guidelines for Cryotherapy). Encourage the woman to ask questions.
- 3.2 Make sure that the cryotherapy instrument and gas (CO<sub>2</sub>) are ready to use.
- 3.3 Replace the protective cover placed on the easily damageable part of the cryotherapy machine with a sterilized/high-level disinfected cryotip.
- 3.4 Before bringing the woman into the examination room, be sure she has recently (within the past 30 minutes) emptied her bladder. Assist her onto the examining table and drape her.
- 3.5 Wash your hands thoroughly with soap and water and dry them with a clean, dry cloth/towel or air dry. Avoid sharing cloths/towels to ensure proper infection prevention.
- 3.6 Put on a pair of new examination or high-level disinfected surgical gloves. If available, put a second glove on one hand.
- 3.7 Arrange instruments and supplies on high-level disinfected tray or container.

### 4. Performing the cryotherapy procedure

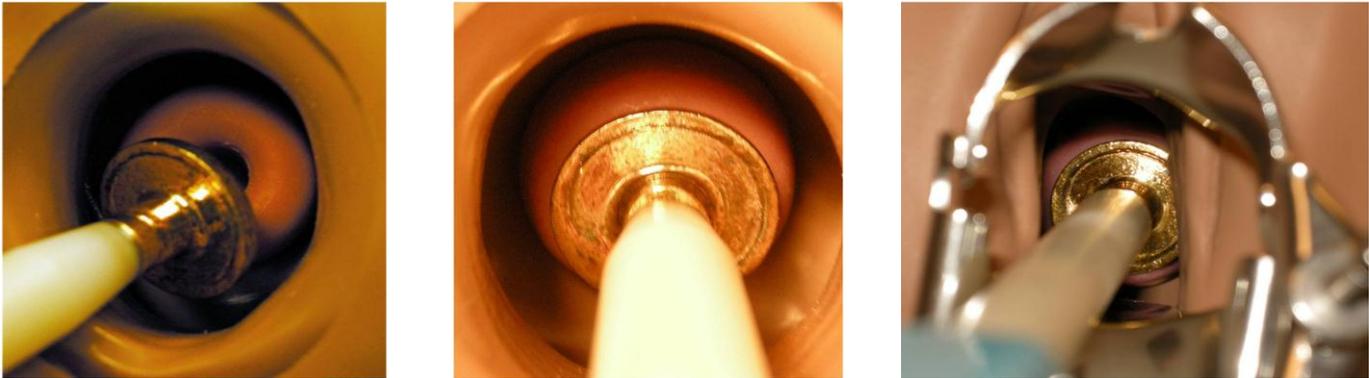
- 4.1 Inform the woman that the speculum is about to be inserted and that she may feel some pressure.
- 4.2 Gently insert the speculum fully, open the blades slowly, and fix the blades to see the entire cervix. If using outer glove, remove it from your hand by turning it inside out.
- 4.3 Move the light source so you can see the cervix clearly.



Photograph courtesy of Paul Blumenthal.

- 4.4 Clean discharge, blood, or mucus from cervix with swab. Identify the cervical os, SCJ, and site and size of lesion (apply dilute acetic acid if necessary). Dispose of swab.
- 4.5 Point the probe at the ceiling (but away from the patient). Pull the freeze “trigger” for 1 second and then put it on the defrost setting for 1 second to blow gas out through the thin metal tube and “clear the system.”

- 4.6 Apply the cryotip to the cervix, ensuring that the nipple is centered and placed securely on the os.



Photographs courtesy of Paul Blumenthal.

- 4.7 Hold the cryoprobe perpendicular to the plane of the cervix. Press the freeze trigger to start the freezing process. Set the timer for 3 minutes. Be sure to apply pressure to the cervix as the gas begins to flow to the cryoprobe. Watch as the ice ball develops at and around the cryotip.
- 4.8 Ensure that the cryoprobe and tip does not touch the vagina while freezing the cervix. If the probe touches the vagina, damage could occur to the vaginal tissue resulting in pain and bleeding. If necessary, place a long wooden tongue depressor or spatula (or some other non-metallic device that will not crack with exposure to cold temperatures) between the cryoprobe and the (usually) lateral vaginal walls, to protect the vagina.
- 4.9 Use the double-freeze technique:
- Freeze for 3 minutes, wait for tip to release from cervix (as it attaches with the ice).
  - Wait for 5 minutes.
  - Repeat freezing for another 3 minutes again and wait for tip to release from cervix.



Photograph courtesy of Paul Blumenthal.

- 4.10 After removing the cryogun, inspect cervix to verify that a hard, white, frozen “ice ball” is present.
- 4.11 Inspect the cervix for any bleeding. If there is bleeding, apply pressure using a clean cotton swab. Then dispose of swab.
- 4.12 Remove the speculum and place in a 0.5% chlorine solution for 10 minutes for decontamination.

## **5. Post-cryotherapy tasks**

- 5.1 Wipe the light source with 0.5% chlorine solution or alcohol.
- 5.2 Immerse both gloved hands in 0.5% chlorine solution, remove gloves by turning inside out, and dispose of them in leak-proof container or plastic bag.
- 5.3 Wash hands thoroughly with soap and water and dry with a clean, dry cloth, or air dry.
- 5.4 Check if the woman is having excessive cramping before helping her sit up. If she is not experiencing excessive cramping, help her get down from the examination table and ask her to get dressed. If she is experiencing severe cramping after 5–10 minutes, give her an oral analgesic.
- 5.5 Advise the woman regarding post-treatment care, potential side effects, and follow-up schedule.
- 5.6 Record the results of treatment and follow-up plan.
- 5.7 Observe the women for at least 15 minutes. Ask her how she feels before sending her home.
- 5.8 Clean the cryotherapy unit.
- 5.9 Separate the used cryotip from the probe and cover the thin metal tube part of the probe with a different cryotip or protective cover. Process the used cryotip according to the manufacturer’s or Pathfinder’s instructions.
- 5.10 Close the master cylinder valve.

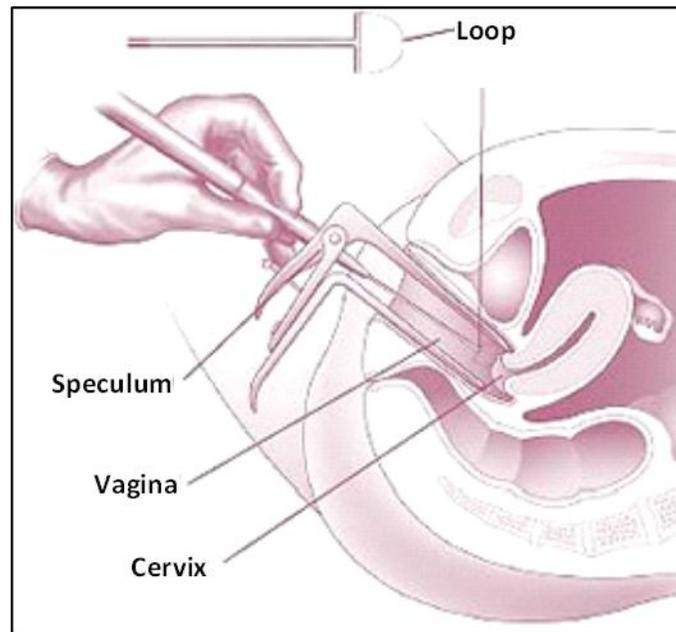
### III. ALTERNATIVE TREATMENTS

#### A. Loop Electrosurgical Excision Procedure (LEEP)

LEEP stands for “loop electrosurgical excision procedure” and is also called loop excision. It is more expensive than cryotherapy. It is a technique that uses electrical current passed through a thin wire loop to remove abnormal tissue. Unlike cryotherapy, LEEP requires local anesthesia and electricity. Compared to cryotherapy, LEEP has a slightly higher rate of complications and side effects (e.g., post-procedure bleeding and pain during procedure). Unlike cryotherapy, LEEP enables tissue sampling for diagnosis. However, there is no major difference in effectiveness between the two.

##### 1. Figure 1. LEEP procedure<sup>10</sup>

The doctor will insert a speculum into the vagina in the same way as for a pelvic exam. The loop is inserted into the vagina and then to the cervix. Different sizes and shapes of loops can be used.



##### 2. Figure 2. Steps involved in LEEP procedure.<sup>10</sup>



**1. A close-up view of the surface of the cervix shows areas of abnormal cells.**



**2. The loop is used to cut away a thin layer of the cervix.**



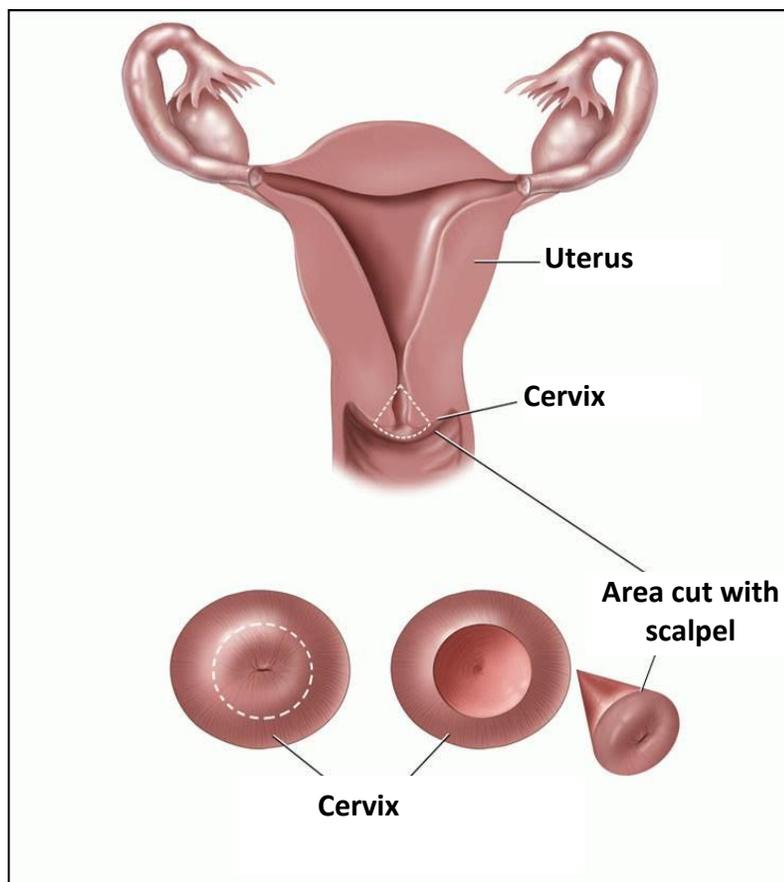
**3. The loop removes the abnormal tissue from the cervix.**

<sup>10</sup> Images retrieved from American Congress of Obstetricians and Gynecologists, [www.acog.org](http://www.acog.org), December 28, 2011.

## B. Conization (Cone Biopsy)

Conization is the removal of a cone-shaped area from the cervix, including portions of the outer cervix (ectocervix) and inner cervix (endocervix). Excision can be performed with a scalpel (cold-knife conization), laser, or electrocautery loop. Cold-knife conization (also called “cone biopsy”) involves removing a large area of the cervix with a scalpel, and is usually done in the operating room under general or regional (spinal or epidural) anesthesia. It provides the cleanest specimen margins for looking at under a microscope, but it is typically associated with more bleeding than laser or LEEP. Conization is recommended for the treatment of lesions that cannot be treated with cryotherapy (large or unknown extent of lesion) and unclear type of cervical abnormality to rule out invasive cervical cancer as it allows taking tissue for biopsy to confirm the diagnosis. The woman may be discharged from the hospital the same or the next day. Complications include bleeding, infection, stenosis, and cervical incompetence with possible decreased fertility.

### 3. Figure 3 Conization (cone biopsy)<sup>11</sup>

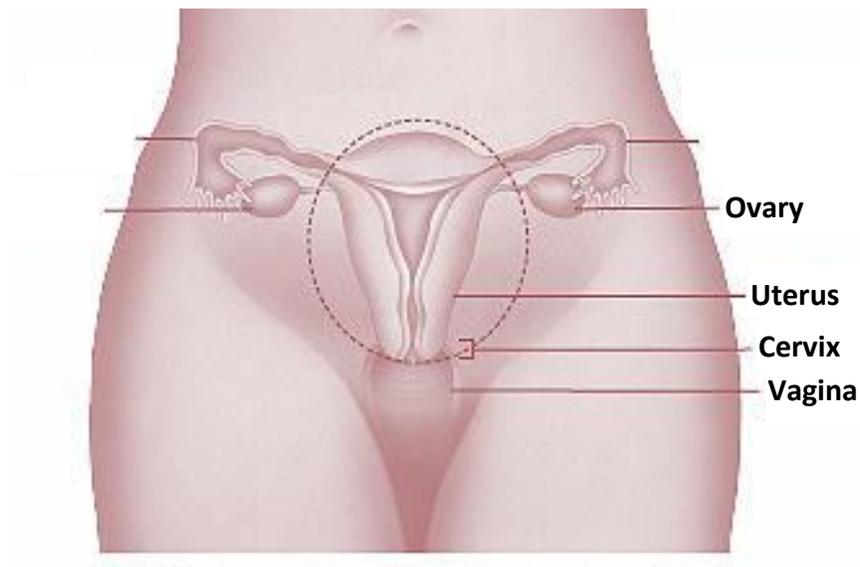


<sup>11</sup> Image retrieved from <http://www.ihacares.com/index.cfm/HealthAdvisors/WomensHealthAdvisor/crs-wha-art.cone.biopsy/>.

### C. Simple or Total Hysterectomy

This is the surgical removal of the entire uterus, including the cervix. Hysterectomy is not usually indicated for treatment of high-grade precancerous lesions and carcinoma in situ, which can be treated with simpler outpatient methods. For lesions that cannot be treated with cryotherapy or LEEP, inpatient methods such as cold knife conization are appropriate, but hysterectomy may be used when there are no alternative treatments. It is a highly invasive procedure with risk of complications such as infection, hemorrhage, and injury to adjacent organs.

#### 4. Figure 4. Simple or Total Hysterectomy<sup>12</sup>



<sup>12</sup> Image retrieved from <http://www.nycosmetics.com/en/gynecology/health-topics/treatment-of-abnormal-pap-smears/>.

## IV. INFECTION PREVENTION AND CARE OF THE CRYOTHERAPY UNIT

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### A. Handwashing

Handwashing is the single most important step in preventing infection, because we touch surfaces with our hands and then touch our face (eyes, nose, mouth) carrying microorganisms into the body. Handwashing removes many microorganisms from the skin, which helps to prevent transmission of infections from person to person.

#### 1. Handwashing should be done:

- a. Before: the day's work; examining a client; performing any medical procedure (e.g., VIA, cryotherapy, insertion of an intrauterine device [IUD] or pelvic exam); handling clean, disinfected, or sterilized supplies for storage; putting on sterile gloves; going home.
- b. After: any situation in which the hands may be contaminated, such as handling instruments; touching bodily secretions or excretions; removing gloves; personal use of toilet; blowing nose, sneezing, or coughing.

#### 2. Supplies needed for handwashing:

- Clean water (water may be running or from a bucket, but it must be clean)
- Soap
- Soap dish that drains and keeps the soap dry
- Clean, dry cloth/towel. Avoid sharing cloths/towels to ensure proper infection prevention.
- Bucket and dipper, or alcohol if no running water is available
- Soft sticks or brushes for nail cleaning, if available

### B. Decontamination, Cleaning, and High-Level Disinfection

The three basic steps of the infection prevention processes recommended to reduce disease transmission from soiled instruments (speculum, forceps, cryotip, etc.) and other reusable items are: decontamination, cleaning, and sterilization or high-level disinfection.

#### 1. Decontamination and cleaning

##### 1.1 Equipment and instruments required for decontamination

Prior preparation of the following equipment and instruments is essential for proper decontamination:

- Liquid/powder soap
- Clean water
- Measuring jug/container
- Buckets for three different solutions. Before any procedure, prepare different decontaminating solutions with recommended concentration in three buckets (one for chlorine solution; one for soap solution; and one for clean water). Always use plastic-type containers.
- 0.5% chlorine [bleach]. If the available chlorine concentration is not as required, you need to dilute with water. To determine the total parts water needed for dilution, you can use the following formula. Finally, mix 1 part concentrated chlorine with the total

parts water to be added).

$$\text{Total parts water to be added} = \left( \frac{\% \text{ Concentrate (written on container)}}{\% \text{ Dilute (required concentration for the decontamination)}} \right) - 1$$

*Example: For 5% concentrated chlorine, you will take 1 part concentrated solution and add to 9 parts water.*

## 2. Decontamination and cleaning process after completing VIA procedure:

- 2.1 Dispose of contaminated objects (swab and other waste) in a leak-proof container with cover while still wearing your glove.
- 2.2 Fully submerge used speculum and forceps in the plastic container filled with 0.5% chlorine solution for **only** 10 minutes.
- 2.3 Immerse both gloved hands in the bucket containing 0.5% chlorine solution and remove by turning them the inside out and dispose of them in a leak-proof container.
- 2.4 After 10 minutes, clean instruments with a brush and soapy water, then rinse at least three times with clean water and dry properly (use examination glove during cleaning).

### *Notes to provider:*

- Do not use abrasive cleaners (e.g., Vim) or steel wool because these products can scratch or pit metal or stainless steel. These scratches then become a nesting place for microorganisms, making cleaning more difficult.
- Contaminated surface(s): If there is any surface (procedure table or instrument stand) that could have been contaminated by blood or other bodily fluid, you should decontaminate by wiping down with chlorine solution before you remove the glove or the surface should be cleaned after each procedure.

## 3. Decontamination and cleaning after completing cryotherapy procedure:

- 3.1 Immerse both gloved hands in the bucket containing 0.5% chlorine solution and remove gloves by turning them inside out. Dispose of them in a leak-proof/plastic container.
- 3.2 Before beginning the cleaning process, put new examination or utility gloves on both hands to protect yourself.
- 3.3 Decontaminate the cryotherapy unit, hose, and regulator by wiping them with alcohol (70–90%).
- 3.4 Separate the cryotip from the probe, make sure the rubber stopper is placed in the opening, and cover the thin metal tube part of the probe with another cryotip or protective cover (if available).

**Note to Provider:** Always protect the thin metal tube from damage because it is very sensitive and easily damaged.

3.5 Put the cryotherapy unit on the pre-prepared location or in the holder on the regulator.

3.6 Wash the cryotip with soap and water until visually clean and rinse it thoroughly with clean water.

3.7 Allow the cryotip to air dry.

**Reminder to Provider:**

- Do not allow the cryotip to fall out during washing.
- Do not submerge the cryotip in any chemical or disinfectant solution.
- After washing, the cryotip can be sterilized with high-pressure steam sterilization (autoclave) or high-level disinfectant by boiling for 20 minutes before reuse (timing starts when the water starts to boil/bubble).

#### 4. Sterilization

a. After decontamination and cleaning, and before sending to the central sterilization room, all instruments should be packed independently.

4.1 The cryotip should be wrapped in a double thickness cotton cloth before sending for steam sterilization.

4.2 Forceps, speculums, and all other jointed instruments should be in the open or unlocked position.

4.3 Instruments should not be held tightly together in a way that will prevent steam contact with all surfaces.

4.4 It is best to wrap clean instruments and other clean items in a double thickness of cotton cloth.

4.5 Make sure a metal band around the drum is open before sterilization to allow steam into the drum through the perforated wall.

b. After sterilization and before transporting to the VIA/cryotherapy procedure unit

4.6 Make sure metal bands around all drums are closed.

4.7 Make sure all packs with cotton cloth are dry. (Condensation might develop, which increases the probability of microorganism accumulation.)

4.8 Transfer forceps and their holding containers should be cleaned and dried daily and whenever visibly contaminated (need sterilization).

4.9 After sterilization, store the wrapped cryotip in a clean and dry place. It can be reassembled and reattached to the cryoprobe during cryotherapy procedure.

## C. Handling, Care, Transport, Storage, and Use of CO<sub>2</sub> Gas Cylinder and Cryotherapy Machine<sup>13</sup>

### 1. Storage of CO<sub>2</sub> Gas Cylinders

- 1.1 Gas cylinders should not be stored for excessive periods of time. Purchase only enough gas to meet short-term needs.
- 1.2 Rotate stocks of gas cylinders to ensure that the first in are the first used.
- 1.3 Store gas cylinder in a dry, safe place on a flat surface in the open air. If this is not possible, store in an adequately ventilated building.
- 1.4 Protect gas cylinders from external heat sources that may adversely affect their mechanical integrity. This is particularly important in hot climates.
- 1.5 Store gas cylinders at a temperature of 20–30° Celsius (68–86° Fahrenheit) and away from sunlight.<sup>14</sup>
- 1.6 Gas cylinders should be stored away from sources of ignition and other flammable materials. You could also post warning notices prohibiting smoking and unprotected electrical lighting devices or open flames.
- 1.7 Ensure the valves on empty cylinders are closed to prevent contaminants from entering the cylinder.
- 1.8 Store gas cylinders securely when they are not in use. They should be properly restrained, unless they are designed to be freestanding.
- 1.9 Store cylinders where they are not vulnerable to hazards cause by impact (e.g., away from vehicles and human movement).

### 2. Transport of CO<sub>2</sub> Gas Cylinders

- 2.1 Avoid the need for manual handling of gas cylinders whenever possible (e.g., by using cylinder trolleys).
- 2.2 Do not use valves, shrouds, or caps for lifting cylinders
- 2.3 Gas cylinders should not be raised or lowered unless adequate precautions are taken to prevent them from falling.
- 2.4 Fit suitable protective valve caps and covers to cylinder, when necessary, before transporting. This helps prevent moisture and dirt from gathering in the valve of the cylinder, and provides protection during transport.
- 2.5 Securely stow gas cylinders to prevent them from moving or falling. This is normally in the vertical position.
- 2.6 Avoid transport them in vehicles where the load space is not separated from the driver's compartment.

<sup>13</sup> Medical Gas Data Sheet (MGDS): Medical carbon dioxide, Essential safety information. BOC: healthcare, Customer Service Centre, Priestley Road, Worsley, Manchester M28 2UT. Available at: [www.bochealthcare.co.uk](http://www.bochealthcare.co.uk)

<sup>14</sup> McIntosh N, Blumenthal P, Blouse A. (Eds.). (July 2006). Cervical cancer prevention guidelines for low-resource settings. Baltimore, MD: JHPIEGO Corporation.

2.7 2.7 Disconnect regulators and hoses from cylinders before lifting and transport.

### **3. Handling, Care, and Use of CO<sub>2</sub> Gas Cylinders**

- 3.1 Gas cylinders should always be stored in the upright position.
- 3.2 Do not move cylinders unnecessarily and always keep them in a secure place by attaching them to a wall.
- 3.3 Do not shake the gas inside the cylinders. However, if this occurs, allow time to pass before using them again. Do not use for at least 4 hours if you think the gas is not in stable condition.
- 3.4 Do not use gas cylinders if they are hot to the touch; wait until they have cooled down.
- 3.5 Do not over tighten when attaching a regulator to a gas cylinder. If possible, tighten by hand only. Always check for leakage.
- 3.6 Always make sure the gas pressure of the regulator is within the green-shaded operating range (40–70 kg/cm<sup>2</sup>).
- 3.7 Do not forget to close the gas valve after completing the cryotherapy procedure.
- 3.8 Remove the remaining gas from the cryotherapy system by deflating (this helps avoid the formulation of ice).

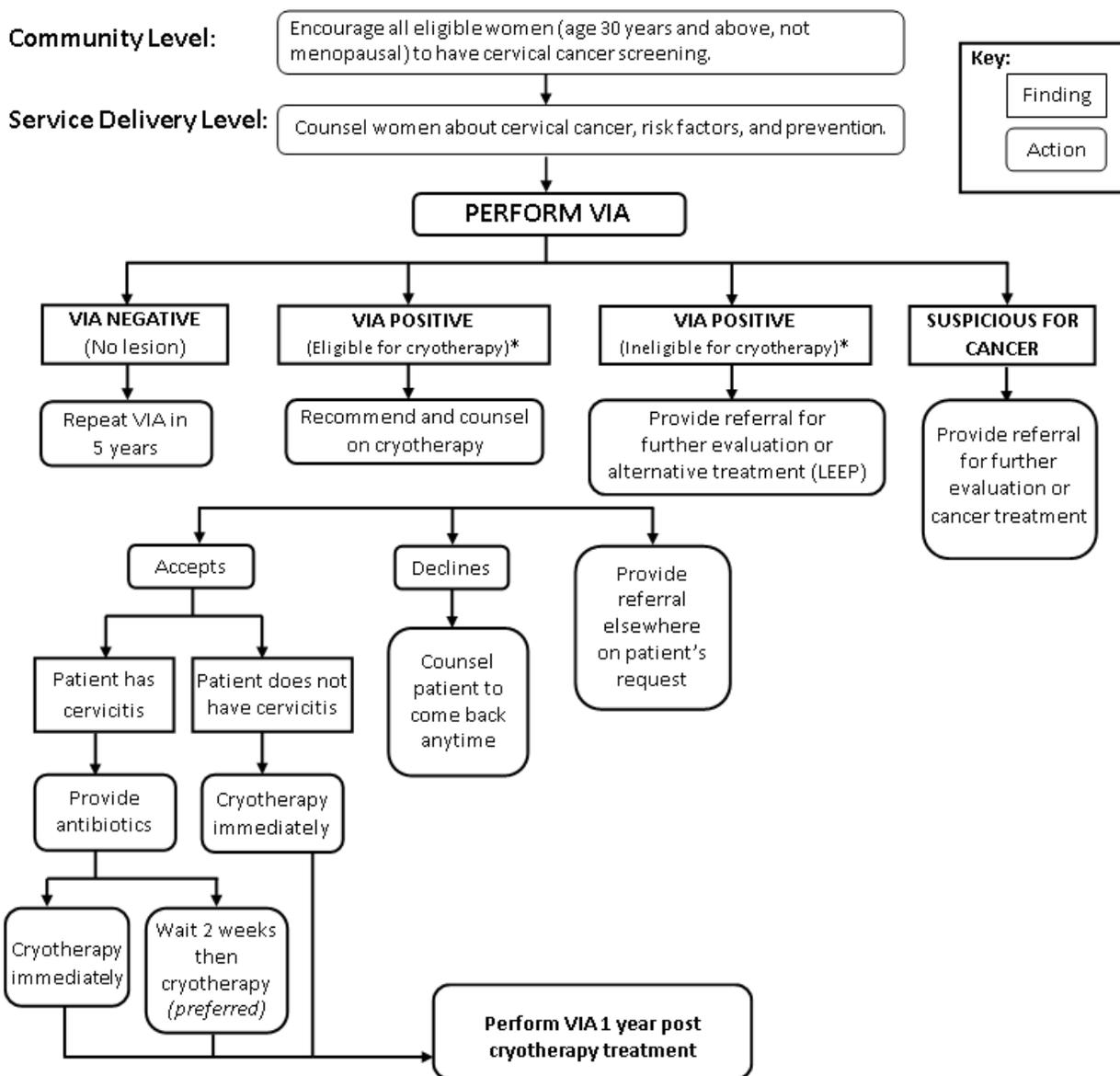
### **4. Handling, Care, and Use of Cryotherapy Machine**

- 4.1 Rings and washers need to be inspected every time the cylinder is changed and replaced. All O-rings, washers, and gaskets must be compatible with the gas. Only use components recommended by the equipment suppliers.
- 4.2 Always screw the fine end of the cryoprobe closed with the cryotip after use.
- 4.3 Do not fit the cryotip into the cryoprobe against resistance as it will erode the screw.
- 4.4 Never apply any kind of lubricant to the thread or the connected thread.
- 4.5 Make sure you have defrosted the cryotherapy machine and cleared the compressed CO<sub>2</sub> gas from the cryoprobe and the cryotherapy machine. (Leaving compressed gas in it creates pressure in the cryotherapy system and damages it.)
- 4.6 Keep the cryotherapy machine in a safe place by either hanging it on the cylinder or in an instrument trolley with the cryotip covered and in a place where people will not touch it.
- 4.7 When applying cryotherapy to the cervical lesion in “freeze” mode, squeeze the trigger gently until it latches. There is no need to maintain pressure on the trigger.
- 4.8 To defrost, squeeze the trigger against the handle and hold. In few seconds the tip will have ice/frost on it, look defrosted, and detach easily from the tissue. Do not attempt to withdraw the probe prior to defrosting, as the tissue will be torn.

# Appendix

## CERVICAL CANCER PREVENTION FLOW DIAGRAM FOR SERVICE PROVISION

### Appendix 1. Cervical Cancer Prevention Flow Diagram For Service Provision



**\*Eligibility criteria for VIA+ includes:** acetowhite lesion <75% of cervix, lesion does not extend onto the vaginal wall beyond the reach of the cryoprobe and if lesion extends <2mm beyond the diameter of the cryoprobe (including the tip of the probe). The specific age range for screening depends on the risk of disease among various age groups and the availability of resources in the specific country.

Adapted from Jhpiego Cervical Cancer Prevention Guidelines for Low-Resource Settings, 2005.

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