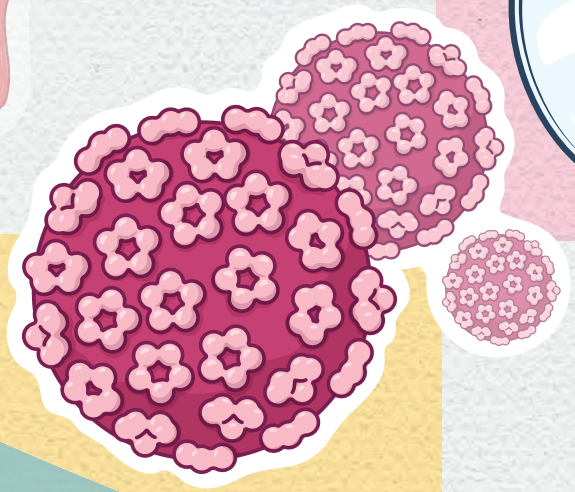

Cervical Cancer Education Manual

Prepared by: Astrid Sacasa and Sasha Lake
St. George's University
Public Health Department
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St. George's University
SCHOOL OF MEDICINE
Grenada, West Indies

Contents

The Authors

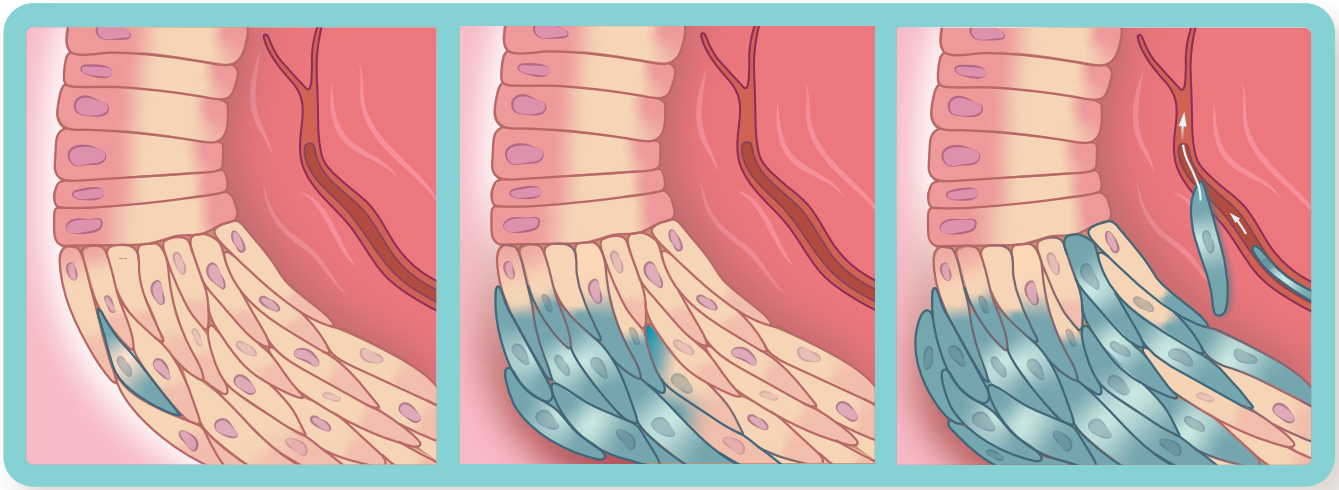
Dr. Sasha Lake is an MD, MPH, MBA graduate of St. George's School of Medicine, Grenada, West Indies and completed undergraduate studies at The University of Tampa. She also has an MSc from Mississippi College, in Clinton, MS, USA. Dr. Lake is originally from Tortola, British Virgin Islands (BVI). While in the BVI Dr. Lake was invested in patient diabetic patient education before attending medical school. She is now a teaching faculty at St. George's University, Grenada West Indies where she is actively involved in fostering medical students' academic growth and professional development. Dr. Lake's public health interest is nestled in advocating for women's health. She has been involved in several public health projects and research, aimed at empowering knowledge on women's health-related issues.

Astrid M. Sacasa, M.D. is a medical school graduate from SGU and a PGY1 Pathology Resident Physician in Florida, USA. I was born in Nicaragua to physician parents, also Pathologists, and understand the important role cancer screenings and prevention have on health in developing countries. My professional interests include women's health and am considering a fellowship in cytopathology. Outside of work I enjoy salsa dancing, traveling, and spending time outdoors with my dachshund puppy. I am incredibly honored to have had this opportunity to contribute to this manual and organization, helping to inform and improve women's health in Grenada.

Background: What is cancer?

Some cells in the human body can undergo changes that results in the development of genetic abnormalities or genetic mutations (National Institute of Health, 2007). A cell's genetic profile can become abnormal due to exposure to infections or toxins. Genetic abnormalities in cells can also be passed on to family members. Normally there are ways the body prevents abnormal cells from dividing and growing. However, abnormal cells can develop additional changes in their genetic material increasing the survival of these abnormal cells. Once these abnormal cells survive, they continue to divide in an uncontrollable manner. This is *cancer*.

Cancer is defined as a disease where some of the body's cells grow uncontrollably. The fast and uncontrollable growth rate of these cells results in the formation of a mass/lump, sometimes called a malignant tumor. Cancer can form in any organ in the body and can spread to other organs or parts of the body. This is called *metastasis* (*met-a-sta-sis*).



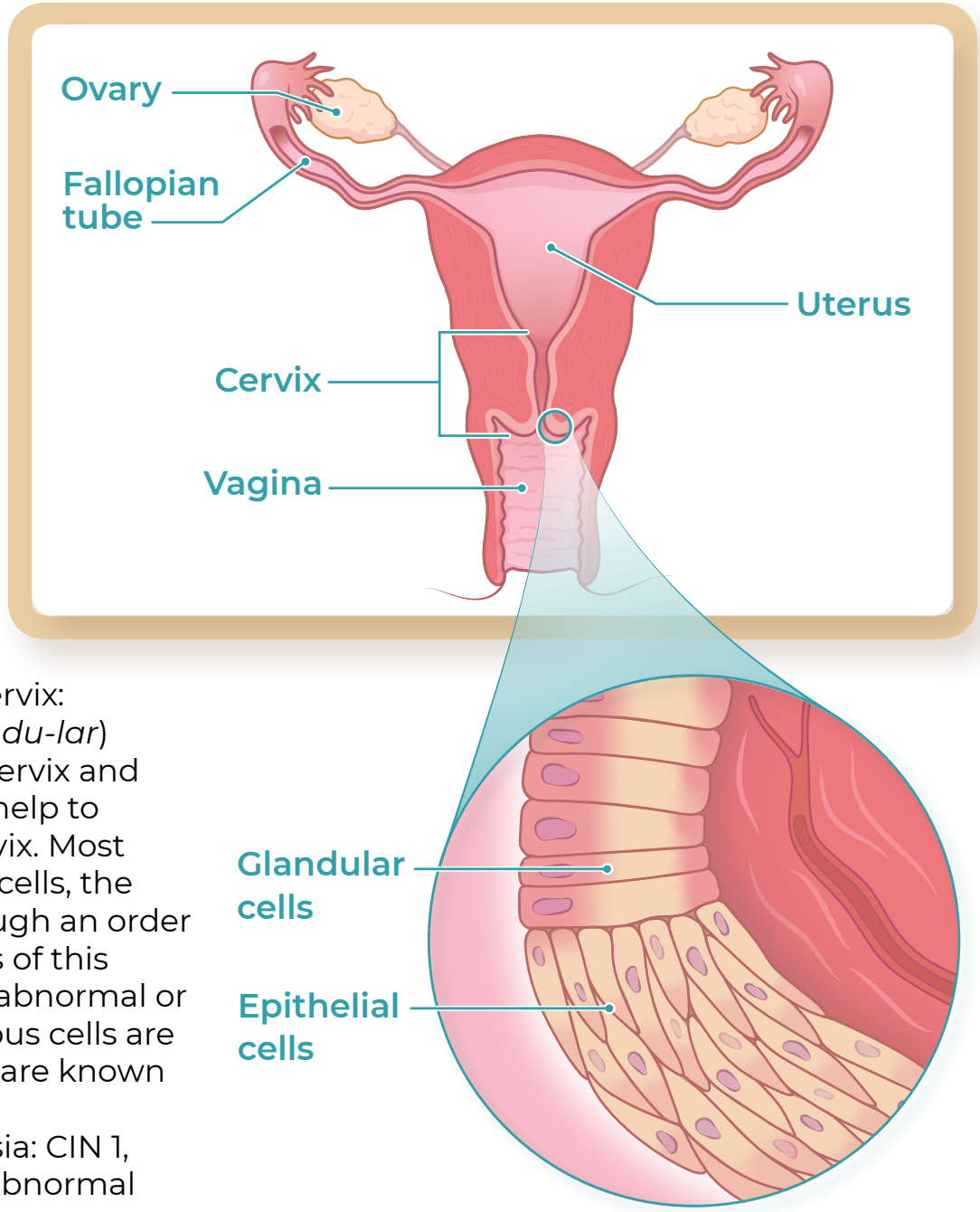
Cell with mutation | Tumor mass growth | Blood vessel infiltration

Worldwide, cancer is the second-leading cause of death in adults (WHO, n.d.). In the Caribbean, the occurrence of cancer is alarming as the number of people being diagnosed with cancer is increasing. Studies projected that in 2012, almost 1.1 million new cancer cases were estimated for the area (Bray & Pineros, 2019). Cancer is the second leading cause of death in the Caribbean region (Razzaghi et al., 2016). Physicians and medical practitioners around the world understand the importance of diagnosing cancer early. Early detection increases survival, as treatment and medical procedures are highly effective when cancer is caught earlier rather than later. Some cancers are completely preventable, and your doctor may be able to do tests known as *screening tests* to check for the earlier signs that are suggestive of cancer. In many cases, early detection through health screening helps to prevent the disease from spreading in the body.

Cervical Cancer

A. The Female Reproductive System

Cervical cancer is a cancer involving the cervix, which is part of the female reproductive system. The female reproductive system includes the ovaries, fallopian tubes (also referred to as uterine tubes), uterus (also referred to as the womb), cervix, and vagina canal. The cervix is the lower, narrow part of the uterus, that opens into the vagina. The normal functions associated with the female reproductive system are menstruation, childbearing, and birth, and the making of hormones such as estrogen and progesterone.



B. What is Cervical Cancer?

There are two types of cells associated with the cervix: *epithelial* (*epi-tea-li-al*) cells and *glandular* (*glan-du-lar*) cells. Epithelial cells line the outer surface of the cervix and protects the surface of the cervix. Glandular cells help to make secretions and are located inside of the cervix. Most types of cervical cancers develop in the epithelial cells, the outer surface of the cervix. These cancers go through an order of progression. In the initial developmental stages of this disease, the cells go through changes that cause abnormal or "precancerous" cells to develop. These precancerous cells are not cancer yet. These abnormal cells of the cervix are known as *dysplasia* (*dis-play-ze-a*).
There are three levels or grades of cervical dysplasia: CIN 1, CIN 2, and CIN 3. The higher the grade the more abnormal the cervical cells are.

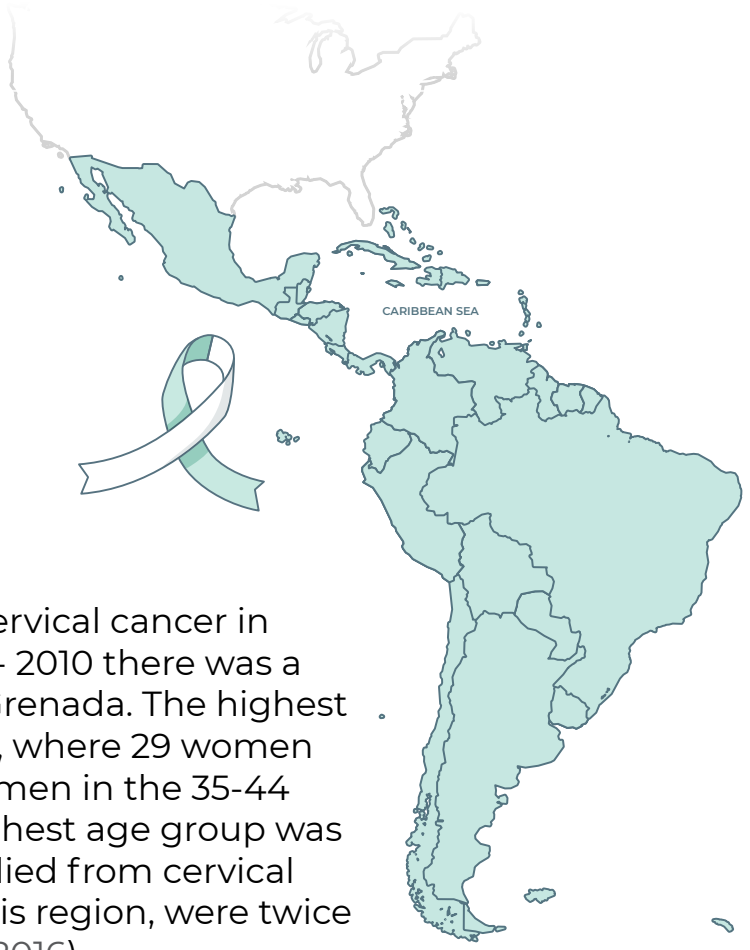
It is important to know that development of these abnormal precancerous cells do not cause symptoms instantly so these early changes within the cervix may go unnoticed. If precancerous cells are not detected and removed, in about 10-30 years they can become cancer cells (Cooper & MacCathran, 2022). When the cancer cells continue to grow and damage the cervix, they can eventually spread or metastasize to other parts of the female reproductive system or other parts of the body. It is at this time when a women may start to have symptoms of cervical cancer.

Even though the early changes to cervical cells are not seen with the human eye, your doctor can do a screening test which involves taking cell samples from the cervix for laboratory analysis referred to as the Papanicolaou Test, better known as the *Pap Smear*. Because changes to the cervix can be detected even before cancer cells are fully developed, cervical cancer is said to be one of the most preventable and treatable cancers.

Statistics on Cervical Cancer

A. Statistics on Cervical Cancer in the Caribbean

The Pan American Health Organization (PAHO) reports that every year more than 56,000 women in Latin America and the Caribbean are diagnosed with cervical cancer and more than 28,000 die from cervical cancer (PAHO, 2012). One study shows that during the ten year period of 2003 to 2013 cervical cancer deaths were 4.5%–18.2% of all cancer deaths in women (Razzaghi et al., 2016). In the Caribbean, cervical cancer follows breast cancer as the leading cause of cancer and death caused by cancer among women in the region.



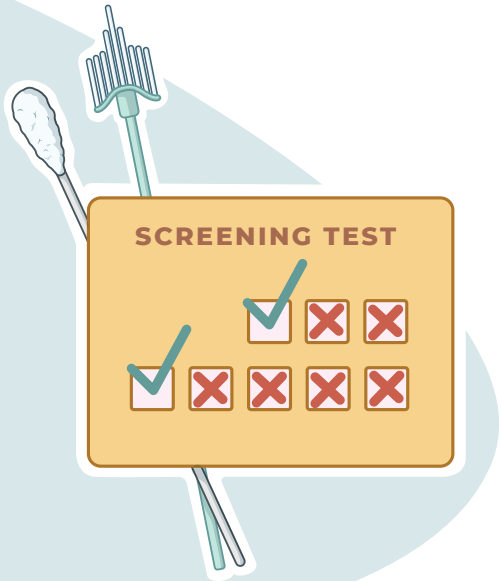
B. Statistics on Cervical Cancer in Grenada

Approximately 20-80 women in 100,000 are diagnosed each year with cervical cancer in the Caribbean (Glasgow et al., 2022). During the ten year period of 2000 - 2010 there was a total of 204 cases of cervical cancer documented in hospital records in Grenada. The highest number of annual cases in this ten year period was documented in 2001, where 29 women were diagnosed with cervical cancer (Bahadoor-Yetman et al., 2016). Women in the 35-44 years age group had the highest rates of cervical cancer. The second highest age group was from 45-64 years old (Bahadoor-Yetman et al., 2016). Most women who died from cervical cancer were over 65 years old. Overall, the estimated cancer deaths in this region, were twice the estimated rates from the rest of the world (Bahadoor-Yetman et al., 2016).

Risk Factors of Cervical Cancer

A. What is a risk factor?

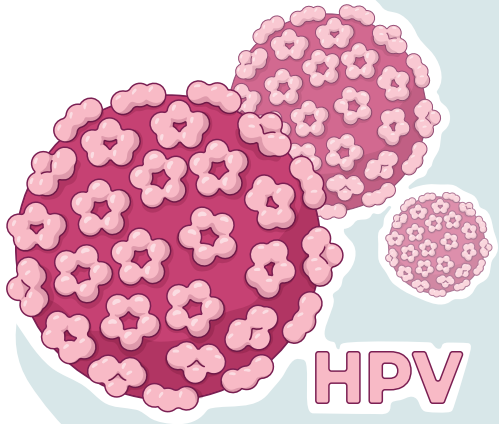
A *risk factor* is anything in our control or not in our control that increases the chance of developing cancer. Modifiable risk factors are those we can change like lifestyle behaviors. Nonmodifiable risk factors are those we can't or have little power in changing such as things passed down genetically from our biological parents or family.



Most types of cervical cancer are associated with modifiable risk factors making it important to know the lifestyle habits that can increase the chances of developing cervical cancer:

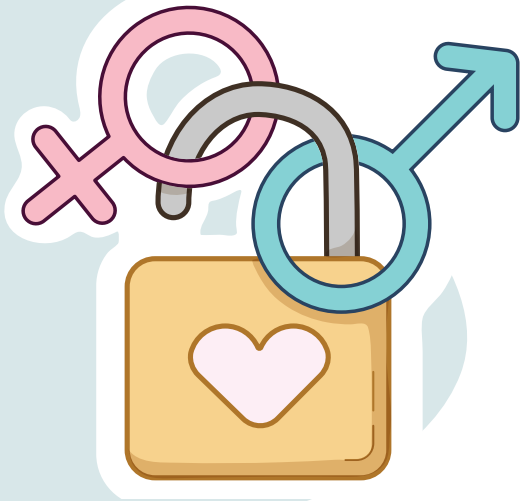
1. Not Keeping Up With Screening Test: Pap smear

By not keeping up with screening tests the chance to detect precancerous cells is missed. Today, most women who are diagnosed with cervical cancer did not keep up with their Pap smears or did not follow up on abnormal Pap smear results (MedlinePlus).



2. Human Papilloma Virus (HPV)

One of the most important risk factors of cervical cancer is *HPV*. It is a common virus that causes warts on the hands, feet, and genital area, as well as cervical cancer (MedlinePlus). Humans get HPV through skin-to-skin contact and by sexual intercourse which is why HPV is thought of as a sexually transmitted infection (STI). Once cells become infected with HPV, the virus causes changes in the cervical epithelial cells leading to the development of precancerous cells.

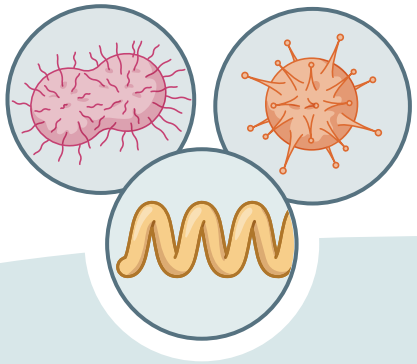


3. Sexual Practices

Starting sex young, under 18 years of age, having multiple sexual partners without using condoms for barrier protection, or having sex with people who have multiple sexual partners increases your chances of getting infected with HPV and cervical cancer in the future.

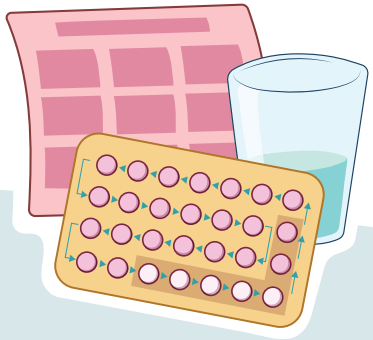
4. Other risk factors:

Woman who *smoke cigarettes* have twice the risk of developing cervical cancer than non-smokers. It spreads the toxins in the blood, changing the cells in the cervix, and it weakens the immune system not letting the body fight off an HPV infection (American Cancer Society, 2020).



Other *STI* like HIV, chlamydia, and gonorrhea create a weak immune system that allows for HPV infection

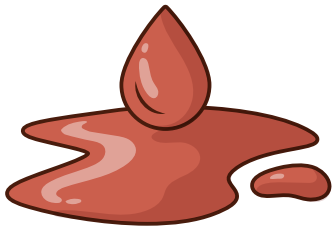
Being Obese or overweight



Birth control use for more than 5 years

Family history of Cervical Cancer

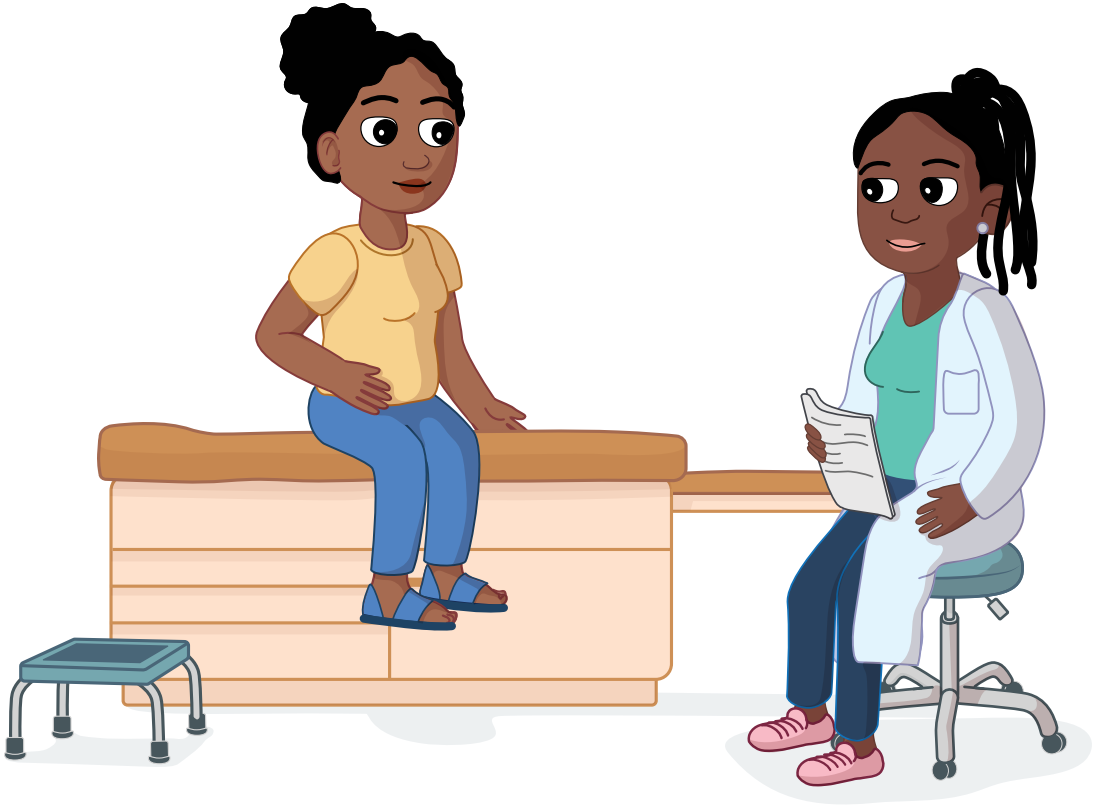
Symptoms of Cervical Cancer



Early in the disease there are no symptoms. Symptoms develop many years after precancerous cells develop. One of the most common symptoms that might suggest signs of cervical cancer includes *abnormal bleeding*. This can include bleeding that starts and stops between regular menstrual periods, or bleeding that occurs after sexual intercourse or a pelvic exam. Others are painful sexual intercourse, menstrual bleeding that is heavier than usual or that lasts longer than usual. Bleeding that happens after having gone through menopause or increased vaginal discharge are also symptoms.

Early Detection, Diagnosis, and Staging

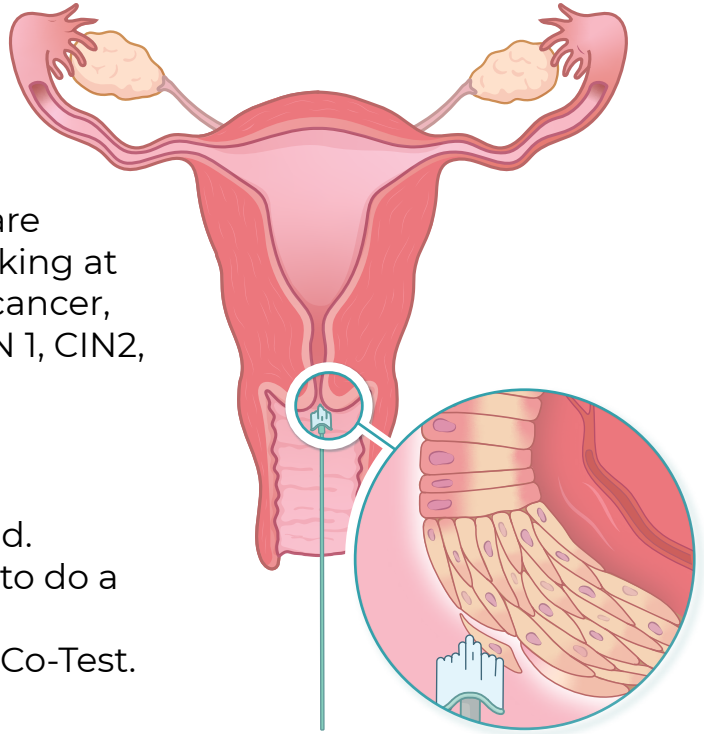
Early detection of cervical abnormalities by health screening is the best way to prevent cervical cancer. Visits to your doctor should be done every year. These visits include an examination of your pelvic/genital area and may also include a screening test for cervical cancer.



Your doctor follows guidelines for screening that is based on age, results of previous screening test, and risk factors. More frequent pap tests may be done for women who are HIV positive, who have had a recent abnormal screening test or biopsy results. In most Caribbean Islands there are three types of screening test available for cervical cancer. They are (1) *The Pap Smear Test,* (2) *HPV Testing* and (3) *Visual Inspection with Acetic Acid (VIA)*. The most important thing to remember is to get screened regularly, no matter which test is available to you.

Pap Smear Screening:

The Pap smear test has been used by doctors since the 1940s for early detection of cervical cancer. During a Pap smear, your doctor will first examine the cervix for any visible signs of cervical cancer. Samples of cells are taken from the cervix using a small brush are taken. The cells are then sent to a laboratory for examination under the microscope. By looking at the cells under the microscope doctors can find out if there is cervical cancer, inflammation, or precancerous lesions also called cervical dysplasia (CIN 1, CIN2, CIN3).



Pap Smear and HPV screening guidelines:

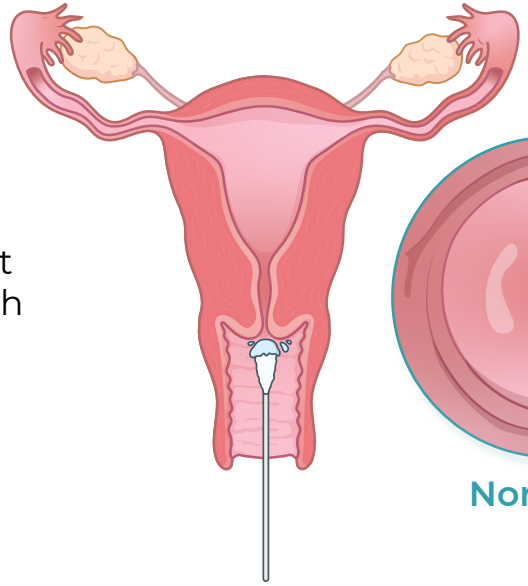
The current recommendation is to start cervical screening at 21 years old. Women who are sexually active at young ages do not necessarily need to do a pap smear for cervical cancer screening before the age of 21 years.
Most of the time, Pap smears are done along with HPV testing called a Co-Test.

Screening guidelines:

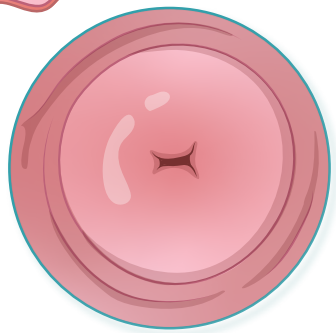
Age	21	25	30 - 65	Over 65
Screening	Pap Smear alone should start at age 21 and done every 3 years.	Screening with HPV test alone as a primary screening.	Screening with Co-Test (pap smear and HPV test) should be done every 5 years	Women with a history of normal screening tests do not need to continue any further screening.

Visual Inspection with Acetic Acid VIA:

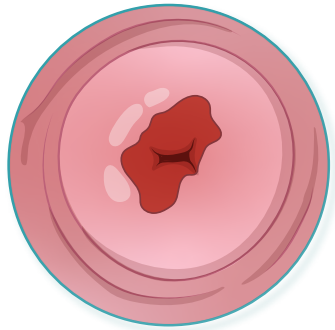
In countries where Pap smears may not be available, performing a VIA is highly effective in screening for cervical cancer (Melek & Bayik, 2011). VIA is carried out by placing a vinegar solution on the cervix. This is a safe method that rarely causes discomfort. The vinegar reacts with the cells and produces changes on the cervix that suggest precancerous cells.



View of the cervix



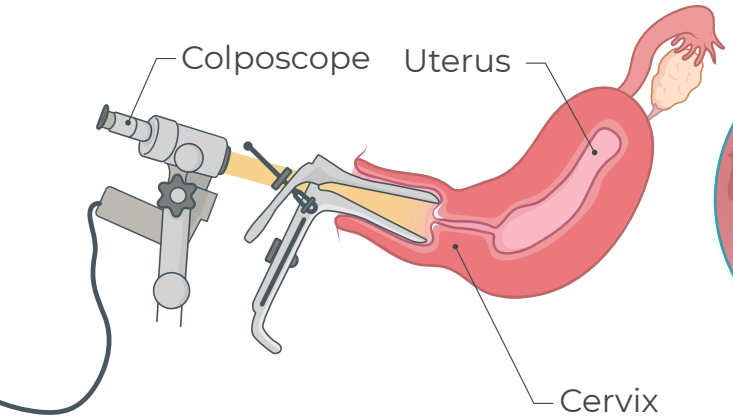
Normal

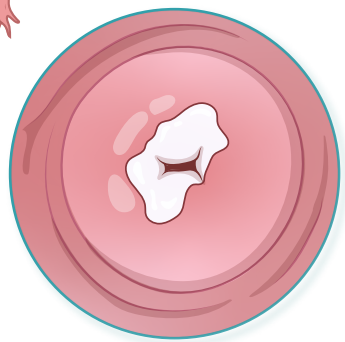


Precancerous cells

Diagnosis

If the VIA test is positive or if abnormal cervical cells or dysplasia is found on Pap smear samples, the next step involves cervical biopsies. Depending on the severity of the result from your screening test your doctor may perform treatment procedures at the time of biopsy. There are two methods of cervical biopsies.
They are (1) *colposcopy* (*col-pos-co-py*) and (2) *Cone biopsies* (also referred to as conization).





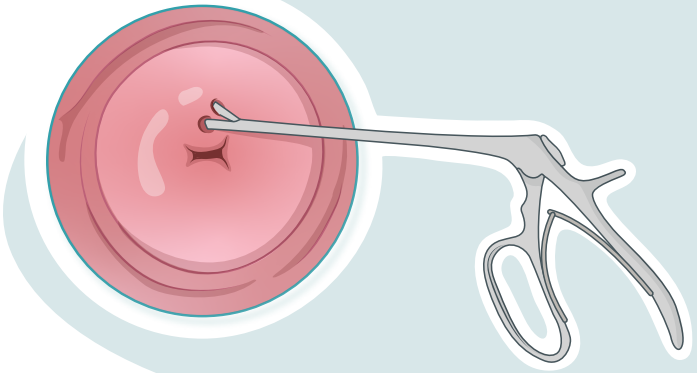
Precancerous cells

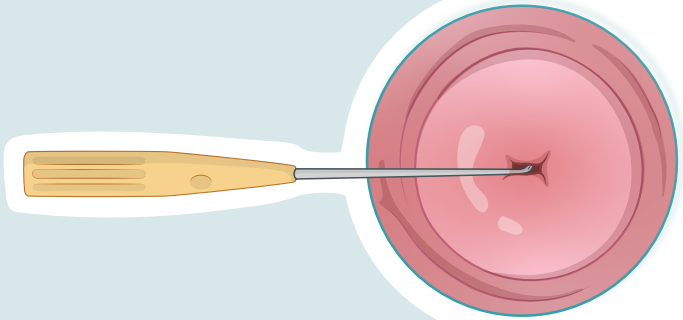
Colposcopy

The colposcopy procedure is done when an abnormal Pap smear, pelvic exam, or positive HPV test is found. This procedure checks the cervix, wall of vagina, and vulva for pre-cancerous or cancerous tissue.
It uses an instrument called a colposcope which has magnifying lenses and a light to examine the cervix. The cervix is coated with a vinegar solution called acetic acid used to visualize and turn the abnormal tissues white. A momentary mild burning sensation is normal.

Tissue Removal Methods for Screening

If abnormal tissue is found, a biopsy called a *colposcopic punch biopsy* is performed. The area is numbed, and a small pinch/cramp sensation is normal as the tissue is removed.

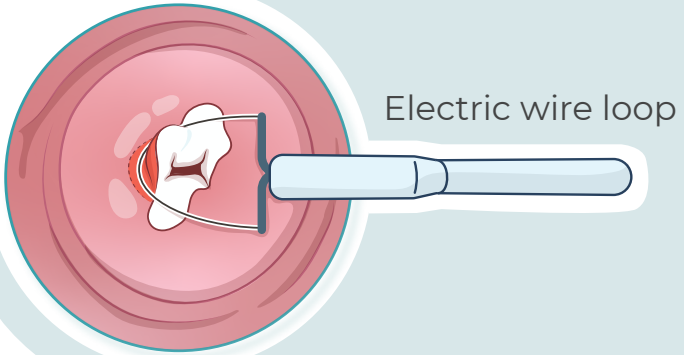




An *endocervical curettage* is usually done along with the colposcopy. This uses a narrow instrument called a curette to scrape the lining of the cervical canal. During and following the procedure you may experience slight cramping as normal. Potential complications include light bleeding, cramps, and mild pain.

Cone Biopsy or Conization

Cone biopsies (also known as conization) is used to diagnose and remove/destroy abnormal cells or get more tissue for additional testing. Conization can involve the *Loop electrosurgical excision procedure (LEEP)* method or the *Cold knife* method to remove a larger cone shaped piece of tissue from the cervix.
The LEEP cone biopsy method uses an electric wire loop under local anesthesia to get a small piece of tissue to be examined under the microscope.
The cold knife cone biopsy method uses a laser or a surgical scalpel to remove a larger piece of tissue. This type of cone biopsy requires general anesthesia.

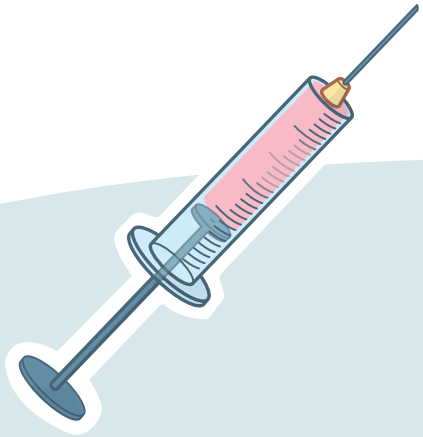


Cone biopsies can be used as treatment for precancerous lesions and early-stage cancers such as CIN 1 and CIN 2. Potential complications include infections, narrowing of the cervix called cervical stenosis, and premature birth or miscarriage from cervical insufficiency as a result of cervical scarring.
Other procedures include *cryosurgery* and *laser therapy*. Cryosurgery freezes the abnormal surface tissue while laser therapy uses heat from a high intensity beam of light to destroy or cut away at abnormal tissue. Neither of these procedures leaves a tissue sample for cancer inspection under the microscope.

Staging

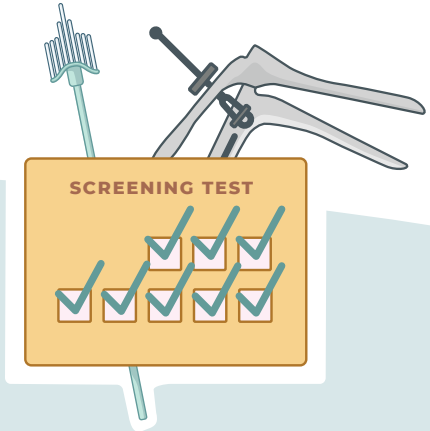
Once the diagnosis of cervical cancer is made, more tests will let us know how far the cancer has spread. This includes the use of other imaging studies like *CT* and *MRI scans* of the pelvis, *X-rays*, *cystoscopy* to see the inside of the bladder and urethra, among others. Additional surgeries or procedures might be needed such as lymph node dissections or biopsies of nearby organs to determine if the cancer has spread.

Prevention:



Getting the *HPV vaccine* will help prevent most types of HPV infection that cause cervical cancer

Safer sex practices



Getting *Pap smears* with or without the HPV test, as recommended by the guidelines to help detect early changes

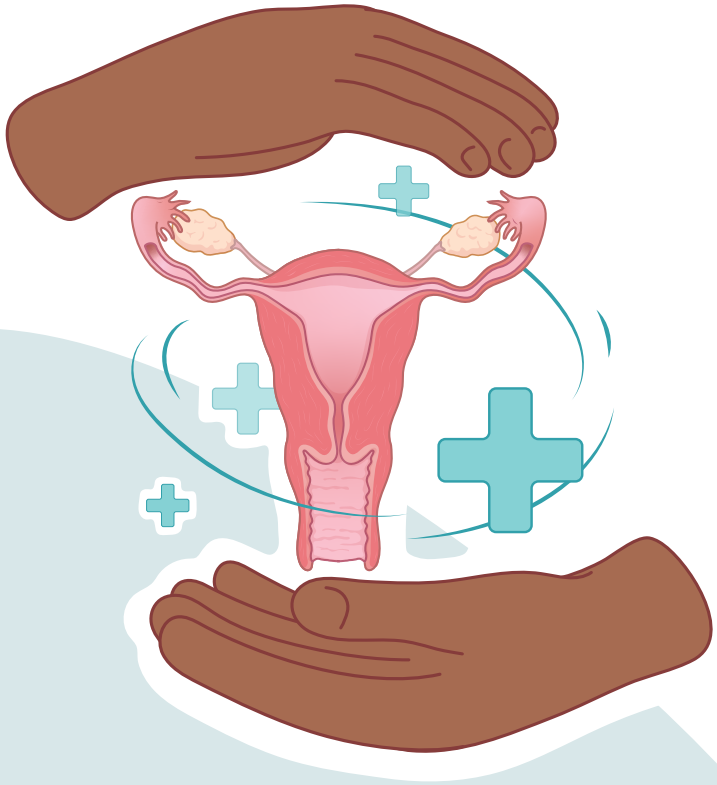
Don't smoke or quit smoking

Treatment and Prognosis

Treatment of cervical cancer depends on the *stage of the cancer*, the *size and shape of the tumor*, the *woman's age* and *general health*, and her *desire to have children in the future*.
Treatment for more cervical precancerous lesions and small early cervical cancer includes LEEP, cryotherapy, laser therapy, conization, or hysterectomy.

Treatment for more advanced cervical cancer may include:

Radical hysterectomy: removes the uterus, lymph nodes, and upper part of the vagina. This is done on younger healthier women with small cancers. *Radiation therapy* along with *chemotherapy* is done on women who are not good surgical candidates or who have tumors too large for radical hysterectomy. *Radiation* may be used for cancer recurrence. *Chemotherapy* uses drugs to kill cancer cells and may be used alone, with surgery, or with radiation.



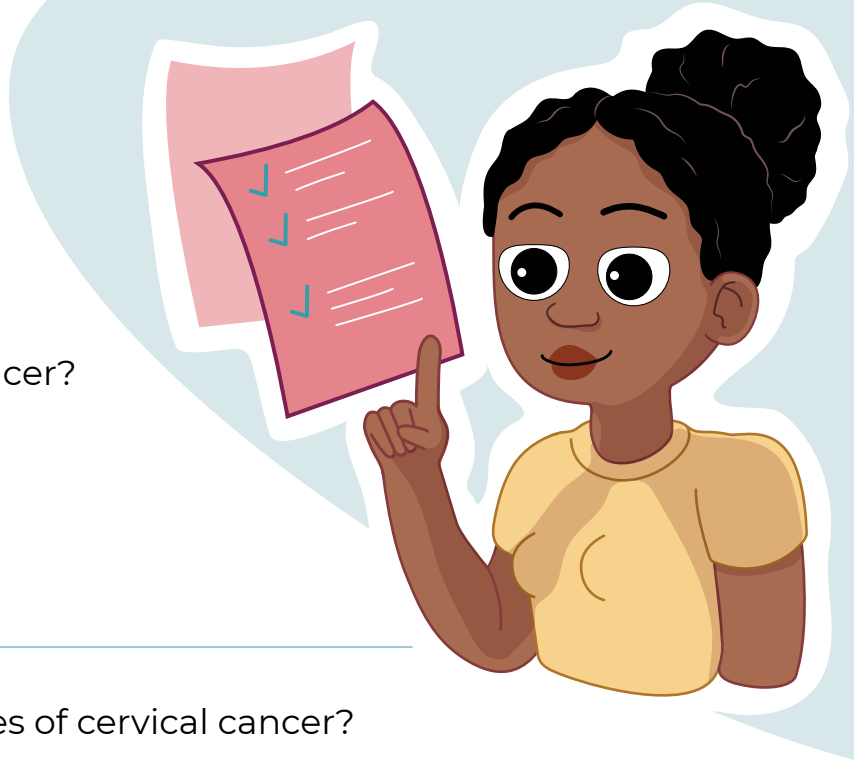
Prognosis:

Precancerous lesions of abnormal cells can be cured completely with proper follow up and treatment. Destroying or removing the abnormal cells in cervical dysplasia happens in about 90% of cases. However, when these abnormal cells are not removed and cancer develops, the years of survival decrease. Cervical cancer that has spread to the inside of the cervix walls but not beyond the cervix has a good 5 year survival rate. This rate decreases as the cancer spreads outside of the walls of the cervix into other areas.

Regular screening increases the chance of *early detection* of precancerous cells and timely treatment. Early detection of cervical abnormalities by health screening is the best way to prevent cervical cancer. Women, aged 21 years and over, are encouraged to follow up on *screening every year*. It is also important to maintain a *healthy lifestyle*, including avoiding smoking, abstaining from unprotected sexual activity with multiple partners at young ages, and maintaining a healthy weight. The *HPV vaccine* protects against high-risk HPV types. The vaccine works best when given before the start of sexual activity and it is recommended for girls between 9-14 years old.

Other Links and Information

https://www.paho.org/en/topics/cervical-cancer



Check Your Knowledge

What is the name of the test used to screen for cervical cancer?

- A Colonoscopy
- B Mammogram
- C Pap screen
- D CT scan

Which of the following viruses is responsible for most causes of cervical cancer?

- A Chlamydia
- B Gonorrhea
- C HIV
- D HPV

At what age should you start screening for cervical cancer?

- A 30 years old
- B 18 years old
- C 21 years old
- D 40 years old

CONTINUE WITH THE TEST

Which of the following are symptoms that can most commonly be expected with a diagnosis of cervical dysplasia?

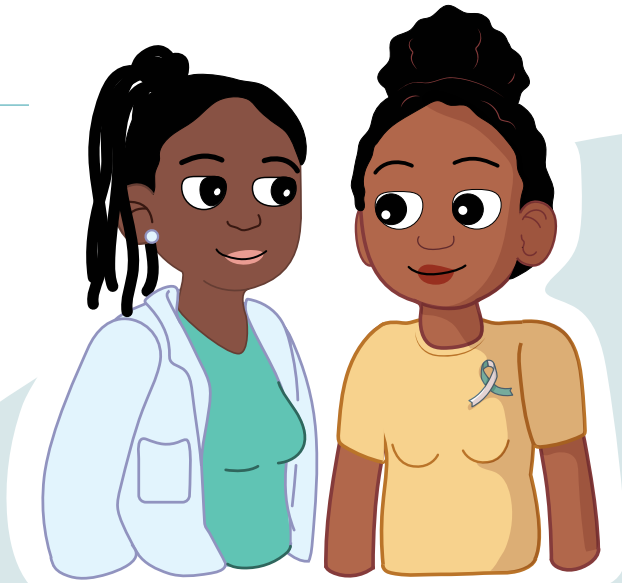
A No symptoms
B Abdominal pain
C Headache
D Urinary tract infection

Which of the following besides safe sex practices can help lower your risk significantly of getting HPV infection?

A Quit Smoking
B Get HPV vaccine
C Weight loss
D Birth control pills

What is one main long-term complication associated with having had a cone biopsy?

A Potential miscarriage from cervical insufficiency
B Nausea and vomiting from abdominal pain
C Cramping from the procedure
D Headache from the anesthesia



CONTINUE WITH THE TEST

What are the most common reasons why women get diagnosed with cervical cancer?

A Unsafe sex practices
B Not getting regular pap screenings
C Not following up on abnormal pap screen results
D B and C

Do you need to receive general or local anesthesia to get a Pap screen?

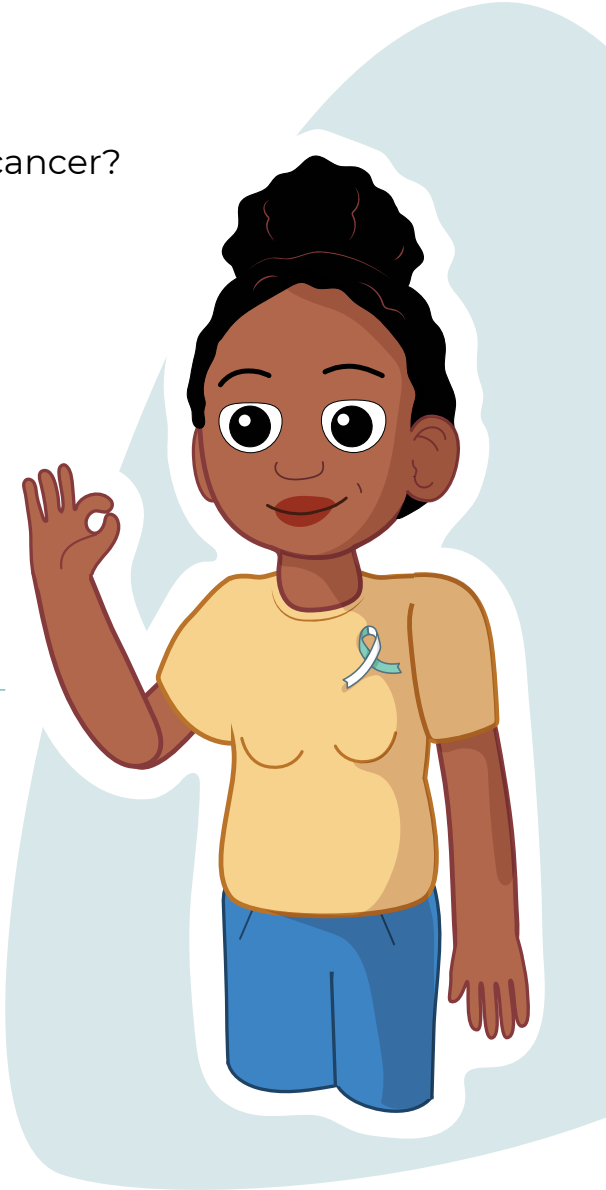
A Yes
B No

Does an abnormal pap screen mean you have cervical cancer?

A Yes
B No

Do you expect to have a pelvic exam alongside your pap smear screening?

A Yes
B No



Resources:

- (2017). Cancer.org; American Cancer Society. https://www.cancer.org/cancer/cervical-cancer/detection-diagnosis-staging/staged.html

- Ardahan, M., & Temel, A. B. (2011). *Visual Inspection With Acetic Acid in Cervical Cancer Screening*. Cancer Nursing, 34(2), 158–163. https://doi.org/10.1097/ncc.0b013e3181efe69f

- Bahadoor-Yetman, A., Riley, L., Gibbons, A., Fields, P., Mapp-Alexander, V., Hage, R., & Baldwin, A. (2016). *Prevalence of cervical cancer and associated mortality in Grenada, 2000-2010*. Undefined. https://www.semanticscholar.org/paper/Prevalence-of-cervical-cancer-and-associated-in-Bahadoor-Yetman-Riley/22db9f437abcc47e8cdfd1db0a096129797f9de4

- Bray, F., & Piñeros, M. (2016). *Cancer patterns, trends and projections in Latin America and the Caribbean: a global context*. Salud Pública de México, 58(2), 104–117. https://doi.org/10.21149/spm.v58i2.7779

- *Cervical Biopsy: Procedure, Aftercare, and Results*. (2022, February 11). Healthline. https://www.healthline.com/health/cervical-biopsy#potential-risks

- Cervical cancer: MedlinePlus Medical Encyclopedia. (2017). Medlineplus.gov. https://medlineplus.gov/ency/article/000893.htm

- Cervical Cancer. (n.d.). Www.hopkinsmedicine.org. https://www.hopkinsmedicine.org/health/conditions-and-diseases/cervical-cancer

- Cervical Intraepithelial Neoplasia (CIN) | Cleveland Clinic. (2011). Cleveland Clinic. https://my.clevelandclinic.org/health/diseases/15678-cervical-intraepithelial-neoplasia-cin

- Colposcopy: Biopsy, Purpose, Procedure, Risk & Results. (n.d.). Cleveland Clinic. https://my.clevelandclinic.org/health/diagnostics/4044-colposcopy

- Colposcopy. (n.d.). Www.hopkinsmedicine.org. https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/colposcopy

- Cooper, D. B., & McCathran, C. E. (2022). *Cervical Dysplasia*. PubMed; StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK430859/#:~:text=The%20median%20age%20of%20HPV

- Glasgow, L., Lewis, R., & Charles, S. (2022). *The cancer epidemic in the Caribbean region: Further opportunities to reverse the disease trend.* The Lancet Regional Health - Americas, 13, 100295. https://doi.org/10.1016/j.lana.2022.100295

Resources:

- Health (US), N. I. of, & Study, B. S. C. (2007). *Understanding Cancer*. In www.ncbi.nlm.nih.gov. National Institutes of Health (US). https://www.ncbi.nlm.nih.gov/books/NBK20362/#:~:text=Cancer%2C%20then%2C%20is%20a%20disease

- Loop Electrosurgical Excision Procedure (LEEP). (n.d.). Cleveland Clinic. https://my.clevelandclinic.org/health/treatments/4711-loop-electrosurgical-excision-procedure-leep

- Mayo Clinic. (2018, December 12). *Cancer - Symptoms and causes*. Mayo Clinic; Mayo Clinic. https://www.mayoclinic.org/diseases-conditions/cancer/symptoms-causes/syc-20370588

- Mitchell, C., & https://www.facebook.com/pahowho. (2019, February 1). PAHO/WHO | *Cervical cancer is the third most common cancer among women in Latin America and the Caribbean, but it can be prevented*. Pan American Health Organization / World Health Organization. https://www3.paho.org/hq/index.php?option=com_content&view=article&id=14947:cervical-cancer-is-the-third-most-common-cancer-among-women-in-latin-america-and-the-caribbean-but-it-can-be-prevented&Itemid=0&lang=en#gsc.tab=0

- Razzaghi, H., Quesnel-Crooks, S., Sherman, R., Joseph, R., Kohler, B., Andall-Brereton, G., Ivey, M. A., Edwards, B. K., Mery, L., Gawryszewski, V., & Saraiya, M. (2016). *Leading Causes of Cancer Mortality* — Caribbean Region, 2003–2013. MMWR. Morbidity and Mortality Weekly Report, 65(49), 1395–1400. https://doi.org/10.15585/mmwr.mm6549a3