

Cervical and Hpv Associated Cancer

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THE STORY IN ONE SENTENCE

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“HPV-linked cancers: prevent with vaccine, catch early with Pap and HPV co-testing, and treat by stage—from simple removal to chemo-radiation.”

Normal anatomy — the body's job

The cervix is the narrow neck at the bottom of the uterus, connecting it to the vagina. Its lining is made of squamous cells (flat, tile-like cells) on the outside and glandular cells (mucus-making cells) on the inside, and these two cell types meet at a zone called the transformation zone. The cervix constantly sheds old surface cells and replaces them with fresh ones, and your immune system patrols the lining to kill any virus-infected cells before they can cause trouble.

BODY'S JOB

The cervix makes mucus to help sperm swim into the uterus or block germs from getting in, and it stretches open during childbirth to let the baby out. The transformation zone is where new cells are actively growing to replace old ones, so it is the most common spot for HPV to sneak in and cause changes. Your immune system's job is to recognize any cell that looks abnormal—such as one infected with a virus—and destroy it before it multiplies.

1. The cervix sits at the top of the vagina, shaped like a short tube with a small opening in the center.
2. The outer part (facing the vagina) is covered by squamous cells, the same flat cells that line your skin inside your mouth.
3. The inner canal is lined by columnar cells that make mucus, like the cells in your nose.

4. Where these two cell types meet—the transformation zone—cells are constantly being replaced, so this zone is most vulnerable to HPV.
5. When HPV infects a cell, it injects its DNA into the cell's control center (nucleus) and rewrites the rules for growth.
6. Normally, your immune cells patrol the cervix, spot infected cells by their abnormal surface markers, and kill them before they multiply.
7. If your immune system clears the virus, the infected cells die off and fresh, healthy cells take their place—this happens in about 90% of HPV infections within two years.

What breaks

High-risk HPV (especially types 16 and 18) hides inside a cervical cell and slips its DNA into the cell's instruction book. The viral DNA makes two proteins—E6 and E7—that jam the cell's brakes (p53 and RB, the proteins that normally stop runaway division). With the brakes broken, the cell divides non-stop and never dies when it should. At first these rogue cells sit only in the surface layer (dysplasia), but over years they pile up, break through the basement membrane (the thin sheet that holds the lining in place), and invade deeper tissue and blood vessels—that is cancer.

CLINICAL TERM

Persistent infection with high-risk HPV (primarily types 16 and 18) leads to integration of viral DNA into the host genome. Viral oncoproteins E6 and E7 inactivate tumor suppressors p53 and RB, causing uncontrolled cell proliferation and failure of apoptosis. This produces cervical intraepithelial neoplasia (CIN), which can progress through CIN 1, 2, and 3 to invasive squamous cell carcinoma or adenocarcinoma. The break is loss of cell-cycle regulation, and the downstream signals are abnormal Pap cytology, positive high-risk HPV DNA, visible cervical lesions, and eventually symptoms of invasion—post-coital bleeding, abnormal discharge, and pelvic pain.

How the body compensates

Early cervical cancer causes no symptoms because the tumor is still small and sits on the surface. Your body tries to contain it by walling off abnormal cells with immune cells, but if the cancer invades, bleeding and discharge appear because torn blood vessels cannot clot fast enough and the cervix cannot repair itself. Vital signs stay normal until the cancer spreads widely or bleeds heavily, so a patient can look stable while the disease is quietly advancing.

1. In CIN (dysplasia), the immune system sends white cells to surround the abnormal patch, trying to kill infected cells—you feel nothing because the fight is microscopic.

2. As the tumor grows, your body routes extra blood to the cervix to bring more immune cells and oxygen, so the cervix may look red and bleed easily when touched (for example, during sex or a Pap test).
3. When cancer invades deeper, it outruns the blood supply; the center of the tumor does not get enough oxygen (hypoxia), so cells die and release fluid—that is the watery or foul-smelling discharge.
4. If a tumor erodes into a large vessel, you may have sudden heavy bleeding; your body tries to clot it, but the raw tumor surface keeps oozing.
5. Pelvic pain appears when the tumor presses on nerves or spreads to the pelvic wall; your nervous system cannot shut off the pain signal because the pressure is constant.
6. Vital signs (blood pressure, heart rate) stay normal until blood loss is severe or the cancer spreads to lungs or liver and disrupts whole-body function—this is the dangerous middle, because the patient looks stable on the monitor while the tumor is quietly growing or slowly bleeding.
7. The crash point is locally advanced disease (tumor fills the pelvis, blocks ureters, or causes kidney failure) or metastatic spread (lungs, liver, bone), where cure is no longer possible and treatment can only slow growth.

Domino effect

1. High-risk HPV (type 16 or 18) infects a cervical cell, usually during sex, and hides inside without killing the cell. — The virus needs the cell alive so it can use the cell's machinery to copy itself. Most times, your immune system finds and kills the infected cell within months, but if it does not, the virus stays dormant for years.
2. Viral DNA slips into the cell's control center (nucleus) and makes two proteins—E6 and E7—that jam the cell's stop-dividing signals (p53 and RB). — p53 is the 'emergency brake' that stops division if DNA is damaged; RB is the 'gate' that keeps the cell from entering the copy phase. When both are jammed, the cell ignores damage and divides non-stop.
3. The broken cell multiplies into a patch of abnormal cells (dysplasia or CIN), piling up in the surface layer of the cervix—still above the basement membrane, so not yet cancer. — Because the cells are dividing out of order, they look crowded and disorganized under the microscope. You feel nothing, because they have not invaded nerves or blood vessels yet.
4. Over months to years, more mutations stack up; some cells gain the ability to make enzymes (proteases) that chew through the basement membrane. — The basement membrane is a thin sheet of protein that holds the lining in place. Once cells break through it, they can invade muscle, lymph channels, and blood vessels—that crossing is the definition of cancer.

5. You notice bleeding after sex, between periods, or after menopause, and a watery or blood-tinged discharge, sometimes with a foul smell. — The tumor is fragile and tears easily, so friction during sex rips small vessels; dead tumor cells in the center break down and leak out as discharge. Your nose detects the smell of dying tissue.
6. If still not caught, the tumor grows into the cervical muscle and pelvic wall, causing deep, constant pelvic or back pain. — The tumor squeezes or invades nerves in the pelvis, and your brain interprets that as a dull ache or sharp pain. Pain means the cancer is no longer confined to the cervix.
7. Cancer cells travel through lymph channels to pelvic and para-aortic lymph nodes, or enter blood vessels and spread to lungs, liver, or bone (metastasis). — Once in the bloodstream or lymph system, a single cancer cell can land in a distant organ, start dividing, and form a new tumor. At this stage, surgery cannot remove all disease, so chemotherapy and radiation are used to slow growth and shrink tumors.
8. Without treatment, metastatic cervical cancer causes weight loss, fatigue, shortness of breath (if in lungs), yellowing of the skin and eyes (jaundice) (if in liver), or bone pain and fractures (if in bone), and eventually multi-organ failure. — Each metastatic tumor steals nutrients and oxygen from normal tissue, and the liver or lungs cannot do their job if filled with tumor. The body runs out of reserve, and vital organs shut down.

Symptoms · what the patient feels, and why

- No symptoms at all (most common with early cervical changes): Early cervical cell changes (dysplasia) and even small HPV-related cancers sit on the surface of the cervix, which has no pain nerves, so your body does not send any warning signals.
- Abnormal Pap test or HPV test result: The screening test picks up cells that look unusual under the microscope or finds HPV DNA (the virus's genetic material) before any cancer has formed. This is the test catching the problem early, not a symptom you feel.
- Bleeding after sex (post-coital bleeding): Abnormal or cancerous tissue on the cervix is fragile and has extra blood vessels growing into it (neovascularization). Contact during sex can break these tiny vessels, causing bleeding.
- Bleeding between periods or after menopause: Cancer or high-grade precancer disrupts the normal lining of the cervix, and the abnormal vessels bleed on their own without a clear trigger.
- Unusual vaginal discharge (watery, bloody, or foul-smelling): Tumor tissue breaks down (necrosis) and leaks fluid, and if it gets infected the discharge develops a strong odor.
- Pelvic pain or pain deep in the pelvis during sex: Advanced cancer grows deeper into the cervix and nearby ligaments and nerves, which do have pain sensors, or it presses on structures around the uterus.

- Pain or difficulty urinating, or blood in the urine: Cancer spreads forward into the bladder wall or presses on the tube that carries urine (ureter), blocking flow or irritating the bladder lining.
- Swelling in one or both legs: The tumor blocks lymph channels or blood vessels in the pelvis, so fluid cannot drain normally from the legs and backs up, causing swelling (lymphedema).

Focused exam

- Pap smear shows abnormal cells (ASCUS, LSIL, HSIL) or HPV test is positive for high-risk types (16, 18, 31, 33, others): Abnormal cells mean HPV has infected the cervix and started to change how the cells grow. HPV types 16 and 18 cause 70% of cervical cancers. Most people feel completely fine because the cervix has almost no pain nerves. Catching it now — before the cells invade deeper — means we can fix it before it becomes cancer.
- Cervix looks red, rough, or has a visible bump or sore on speculum exam: If you can see something wrong with the naked eye, the abnormal cells have grown into a larger area or started to invade the tissue below. This tells you the disease has moved beyond just a few changed cells on the surface — it is now at least moderate to severe dysplasia (CIN2 or CIN3) or early invasive cancer.
- Vaginal bleeding after sex, between periods, or after menopause; foul-smelling or blood-tinged discharge: Bleeding happens when cancer cells invade blood vessels in the cervix and the fragile tumor tissue breaks apart easily. Discharge comes from dead tumor cells and infection. These signs mean the cancer has broken through the basement membrane (the thin layer under the surface cells) and is now invasive cancer, not just pre-cancer.
- Cervix feels hard, enlarged, or stuck in place (does not move when you push on it during bimanual exam): A normal cervix is smooth and moves a little when you push it. A fixed, hard cervix means the cancer has grown large and invaded the tissue around it — the parametrium (the connective tissue holding the cervix in place) or the pelvic sidewall. This is at least stage IIB disease and means surgery alone will not work.
- Swollen, hard lymph nodes in the groin or along the pelvic sidewall on exam or imaging: Cancer cells travel through lymph vessels to nearby lymph nodes. If the nodes are big and hard, cancer has likely spread there. The immune system tries to fight it inside the node, which makes the node swell. This is a sign of at least stage IIIC disease.
- One leg is swollen, painful, or hard to walk on: Swelling in one leg means tumor has blocked the lymph channels or veins that drain blood and fluid from that leg. Fluid backs up like water behind a dam. This is a sign of advanced cancer pressing on or invading the pelvic vessels.

Diagnostics · every test answers a question

- Pap smear (cervical cytology) every 3 years starting at age 21 → Are there abnormal or pre-cancerous cells on the surface of the cervix?
- HPV co-testing (HPV DNA test for high-risk types) every 5 years starting at age 30 (or primary HPV test alone every 5 years age 25–65 per new 2020 guidelines) → Is high-risk HPV (types 16, 18, 31, 33, 45, 52, 58, others) present in the cervix?
- Colposcopy with directed biopsy → Where exactly on the cervix are the abnormal cells, and how deep have they invaded?
- Pelvic MRI or CT scan (once biopsy confirms invasive cancer) → How big is the tumor, and has it spread to nearby organs (bladder, rectum, pelvic sidewall) or lymph nodes?
- PET-CT scan (for advanced or recurrent disease) → Has cancer spread to distant organs (lungs, liver, bones, distant lymph nodes)?
- Serum SCC antigen (squamous cell carcinoma antigen, if tumor is squamous type) or CA-125 (if adenocarcinoma) → Is there a tumor marker we can follow to see if treatment is working or if cancer comes back?

Treatment logic

- HPV vaccination (Gardasil 9: covers types 16, 18, 31, 33, 45, 52, 58, 6, 11) — routine ages 9–26, shared decision-making ages 27–45 → The vaccine teaches your immune system to recognize and destroy HPV before it can infect cervical cells. It blocks infection by the 9 HPV types that cause 90% of cervical cancers and most genital warts. If you never get infected, you never get the DNA break that starts dysplasia. This is primary prevention — stopping the disease before it starts.
- Cervical cancer screening: Pap smear every 3 years (age 21–29), HPV co-test every 5 years or primary HPV test every 5 years (age 30–65) → Finds abnormal cells or high-risk HPV infection years before invasive cancer develops. Dysplasia (CIN2 or CIN3) takes an average of 10–15 years to turn into cancer, so regular screening catches it while it is still just abnormal cells sitting on the surface. At that stage, removing a small piece of cervix with LEEP cures it. This is secondary prevention — catching the break early when it is easy to fix.
- LEEP (loop electrosurgical excision procedure) or cold-knife cone biopsy for CIN2, CIN3, or AIS (adenocarcinoma in situ) → Removes the part of the cervix where HPV has integrated into the cell DNA and caused dysplasia. The abnormal cells are cut out in one piece (a cone-shaped wedge), which also lets the pathologist check the margins (edges) to make sure all the bad tissue is gone. This stops progression to invasive cancer because you have physically removed the cells that were heading in that direction. Cure rate is > 90% if margins are clear.

- Radical hysterectomy with pelvic lymphadenectomy (or fertility-sparing radical trachelectomy if tumor < 2 cm, no lymph node involvement, and patient wants to preserve childbearing) → Removes the cervix, upper vagina, parametrium (supportive tissue around the cervix), and pelvic lymph nodes where cancer spreads first. This cures early-stage invasive cancer (IA2, IB1, IIA1 < 4 cm) by taking out all the tissue the cancer could have reached. Trachelectomy removes the cervix but leaves the uterus so pregnancy is still possible, though with higher miscarriage and preterm birth risk.
- Concurrent cisplatin-based chemoradiation (external beam radiation to pelvis + brachytherapy + weekly cisplatin) for locally advanced disease (stage IB3, IIA2, IIB-IVA) or node-positive early-stage disease → Radiation kills cancer cells in the cervix, parametrium, pelvic sidewall, and lymph nodes by breaking their DNA so they cannot divide. Brachytherapy (radiation source placed inside the vagina next to the tumor) delivers a very high dose directly to the cervix while sparing surrounding organs. Cisplatin makes cancer cells more sensitive to radiation (radiosensitizer) and also kills cancer cells throughout the body via chemotherapy effect. Together, they shrink and destroy tumors too large or invasive for surgery. Cure rate is 60–90% depending on stage.
- Bevacizumab (anti-VEGF antibody) added to chemotherapy (cisplatin + paclitaxel or topotecan) for recurrent, metastatic, or persistent cervical cancer → Bevacizumab blocks VEGF (vascular endothelial growth factor), a signal tumors use to grow new blood vessels. Without new blood supply, tumors cannot get oxygen and nutrients and they shrink or stop growing. Adding bevacizumab to chemo extends survival by about 4 months compared to chemo alone (median survival ~17 months vs. ~13 months in GOG 240 trial). This is palliative treatment — goal is to slow the cancer and give more quality time, not to cure.
- Pembrolizumab or dostarlimab (PD-1 checkpoint inhibitors) for recurrent or metastatic cervical cancer that is PD-L1 positive (combined positive score ≥ 1) or mismatch repair deficient → Cancer cells put up a 'do not attack me' signal (PD-L1) that tricks T cells into ignoring them. Pembrolizumab and dostarlimab block that signal, allowing the immune system to recognize and kill the cancer. In PD-L1-positive tumors, response rate is 15–30%, and some patients have long-lasting responses (> 1 year). Often combined with chemo $\pm$ bevacizumab in first-line metastatic treatment (KEYNOTE-826 trial showed survival benefit).

Medications

HPV vaccine (Gardasil 9) · Preventive (Prophylactic) vaccine (virus-like particle vaccine)

This vaccine teaches your immune system to recognize and destroy HPV before it can infect cells. It contains empty shells that look like the real virus but carry no genetic material. When these shells enter your body, your B cells (a type of white blood cell) learn their shape and

make antibodies (proteins that stick to invaders). If real HPV later tries to enter, those antibodies already waiting in your blood and tissues grab it and mark it for destruction before it reaches the cells lining your cervix. The vaccine blocks nine types of HPV: the two that cause most cervical cancers (types 16 and 18) and seven others that cause warts or less common cancers.

1. Empty virus-like particles enter your muscle and are picked up by dendritic cells (scout cells).
2. Dendritic cells carry the particles to nearby lymph nodes.
3. In the lymph nodes, B cells recognize the particle shape and learn to make antibodies against it.
4. B cells multiply and release antibodies into your bloodstream and tissue fluids.
5. Antibodies travel to mucous membranes (like the cervix) and stay ready.
6. If real HPV arrives years later, antibodies immediately bind to it and prevent it from entering cells.
7. White blood cells destroy the antibody-tagged virus before infection starts.

SAFETY WATCH

Injection-site pain, redness, or swelling for a few days (most common). · Fainting within 15 minutes of the shot (mostly in teenagers; sit for 15 minutes after the injection). · Headache or mild fever. · Do NOT give if someone has had a severe allergic reaction (anaphylaxis) to a previous dose or to yeast (the vaccine is made in yeast cells). · Safe during breastfeeding; delay if pregnant (not because it is harmful, but because we have less safety data).

Cisplatin · Platinum chemotherapy (alkylating-like agent)

Cisplatin is a metal compound (made with platinum) that sneaks into cancer cells and then grabs onto DNA strands, tying them together so the cell can NOT copy its DNA or divide. When the cell tries to divide, it notices the damage and usually triggers its own death (a process called apoptosis). Cisplatin works best on cells that are actively growing and dividing, which is why it hits cancer hard. It is the backbone of chemoradiation for locally advanced cervical cancer and of chemotherapy for metastatic cervical cancer.

1. Cisplatin enters the bloodstream through an IV infusion.
2. It circulates and diffuses into cancer cells (and some normal fast-growing cells).
3. Inside the cell, water molecules activate cisplatin by removing chloride ions, making it reactive.
4. The activated cisplatin binds to the N7 position of guanine bases in DNA, creating crosslinks within and between DNA strands.

5. These crosslinks block DNA replication and transcription (the cell can NOT read its genes or copy its DNA).
6. The cell detects the damage and, if repair fails, triggers apoptosis (programmed cell death).
7. Tumor shrinks as cancer cells die faster than they can divide.

SAFETY WATCH

Kidney damage (nephrotoxicity): give IV fluids before and after to protect kidneys; check creatinine and electrolytes before each dose. · Nausea and vomiting: usually managed with anti-nausea drugs (ondansetron, aprepitant). · Hearing loss (ototoxicity): high-pitched hearing may fade; sometimes permanent; do hearing tests if symptoms appear. · Nerve damage (peripheral neuropathy): tingling, numbness, or pain in fingers and toes; may improve slowly after stopping. · Low blood counts (bone marrow suppression): watch for infection risk (low white cells), bleeding (low platelets), and anemia (low red cells); check complete blood count regularly. · Allergic reactions: rare but can be severe; first infusion is watched closely. · Do NOT use if kidney function is already severely impaired or if hearing loss is significant.

Bevacizumab · Monoclonal antibody (anti-VEGF agent)

Bevacizumab is a lab-made antibody that blocks VEGF (vascular endothelial growth factor), a signal protein that tumors release to grow new blood vessels. Tumors need these new vessels to bring oxygen and nutrients as they grow. By binding to VEGF and keeping it from reaching its receptor on blood vessel cells, bevacizumab starves the tumor. Existing vessels may also become leaky or collapse. Bevacizumab is added to chemotherapy (cisplatin or other drugs) for recurrent, metastatic, or persistent cervical cancer to slow growth and improve survival.

1. Bevacizumab is given by IV infusion and circulates in the blood.
2. Cancer cells release VEGF into the surrounding tissue to call for new blood vessel growth.
3. Bevacizumab binds tightly to VEGF molecules, forming an antibody-VEGF complex.
4. The bound VEGF can NOT reach or activate VEGF receptors on endothelial cells.
5. Without the VEGF signal, endothelial cells stop dividing and forming new vessels (angiogenesis stops).
6. Tumor blood supply becomes inadequate; tumor growth slows and some areas die from lack of oxygen.
7. Combined with chemotherapy, the tumor shrinks more and progression is delayed.

SAFETY WATCH

High blood pressure: monitor every cycle; treat with blood pressure medication if needed. · Bleeding: can be minor (nosebleeds, bleeding gums) or rarely serious (lung, stomach, brain); do NOT use if recent serious bleeding. · Blood clots: risk of a clot in a deep leg vein (deep vein thrombosis), pulmonary embolism (a clot lodging in a lung artery), stroke, or heart attack; watch for leg swelling, chest pain, shortness of breath. · Wound healing problems: bevacizumab slows healing; stop at least 4 weeks before planned surgery and do NOT restart until wounds are fully healed. · Gastrointestinal perforation (hole in the gut wall): rare but life-threatening; stop immediately if severe abdominal pain occurs. · Protein in urine (proteinuria): check urine protein regularly; stop if severe. · Heart failure: rare; use caution if heart disease is already present. · Do NOT use during pregnancy (causes birth defects); use effective birth control during and for 6 months after treatment.

Pembrolizumab · Monoclonal antibody (PD-1 immune checkpoint inhibitor)

Pembrolizumab is a lab-made antibody that blocks PD-1, a brake protein on the surface of T cells (your killer immune cells). Some cancers trick T cells by displaying PD-L1, a protein that pushes the PD-1 brake and tells T cells to stay quiet. When pembrolizumab binds to PD-1, it blocks this shut-off signal, so T cells wake up, recognize the cancer, and attack it.

Pembrolizumab is used for recurrent or metastatic cervical cancer when the tumor tests positive for PD-L1 (meaning it uses this trick) or has high microsatellite instability (MSI-H) or mismatch repair deficiency (dMMR), which makes it more visible to the immune system.

1. Pembrolizumab is given by IV infusion every 3 or 6 weeks and circulates in the blood.
2. It finds and binds to PD-1 receptors on the surface of T cells.
3. Cancer cells display PD-L1 or PD-L2, which would normally bind PD-1 and send a 'don't attack' signal.
4. With pembrolizumab blocking PD-1, the cancer's shut-off signal can NOT get through.
5. T cells remain active, recognize cancer antigens (foreign proteins), and release chemicals (perforin, granzymes) that punch holes in cancer cells.
6. Cancer cells die and the tumor shrinks; the immune system may also remember the cancer and keep fighting.

SAFETY WATCH

Immune-related side effects: because you are releasing the immune system, it can attack normal organs; watch for diarrhea (colitis), shortness of breath or cough (pneumonitis), fatigue or yellowing of the skin and eyes (jaundice) (hepatitis), rash, joint pain, and changes in hormone levels (thyroid, adrenal, pituitary problems). · Thyroid problems: both overactive (hyperthyroidism) then underactive (hypothyroidism); check thyroid tests regularly. · Lung inflammation (pneumonitis): cough, shortness of breath, chest pain; stop pembrolizumab and give steroids if moderate or severe. · Liver inflammation (hepatitis): watch liver enzymes (AST, ALT) before each dose; stop and give steroids if severe. · Colitis: diarrhea, abdominal pain, blood in stool; stop and treat with steroids if severe. · Kidney inflammation (nephritis), skin reactions (severe rash, Stevens-Johnson syndrome), nerve inflammation, heart inflammation (myocarditis, rare but serious): any new symptom needs rapid evaluation. · Infusion reactions: fever, chills, rash during or shortly after infusion; usually mild. · Do NOT use with other immunotherapy or certain chemotherapy unless in a clinical trial; interactions are complex. · Safe contraception required; effects on pregnancy are not fully known but likely harmful.

Red flags

- Heavy vaginal bleeding that does not stop or bleeding after menopause
- Severe pelvic or lower back pain that is new and does not go away
- Swelling in one or both legs, especially if sudden
- Trouble urinating, blood in the urine, or losing control of urine or stool
- Unexplained weight loss or feeling very tired all the time

Nursing priorities

1. Stop any active heavy vaginal bleeding by having the patient lie flat, measuring blood loss with pad counts, starting a large-bore IV, and notifying the provider immediately for possible vaginal packing or emergency radiation — Cervical tumors are very vascular (full of blood vessels) and can bleed suddenly and heavily; hypovolemic shock (low blood volume from bleeding) can happen fast, dropping blood pressure and oxygen delivery to organs; emergency hemostasis (stopping bleeding) with packing or radiation prevents life-threatening bleeding (hemorrhage)

2. Assess pain level using a 0-to-10 scale every 2 to 4 hours and give scheduled opioids or NSAIDs (non-steroidal anti-inflammatory drugs like ibuprofen) as ordered, not just as-needed, for pelvic or bone pain — Pelvic pain from tumor invasion or bone metastases (cancer spread to bones) causes severe suffering and signals advanced disease; around-the-clock pain control prevents breakthrough pain, improves quality of life, and allows the patient to tolerate further treatment like radiation or chemotherapy
3. Monitor urine output every shift and check for signs of hydronephrosis (kidney swelling) like flank pain, because cervical tumors can block the ureters (tubes from kidneys to bladder) — Advanced cervical cancer can compress or invade the ureters, causing urine to back up into the kidneys and leading to kidney failure; early detection with bladder scan or ultrasound allows placement of ureteral stents or nephrostomy tubes (tubes draining kidneys) to save kidney function
4. Check both legs for swelling, warmth, redness, and measure calf circumference; report any asymmetry or new swelling to the provider for urgent Doppler ultrasound — Pelvic tumors press on veins and lymph vessels, causing a clot in a deep leg vein (deep vein thrombosis) (blood clots) and lymphedema (fluid buildup); DVT can break off and travel to the lungs as a pulmonary embolism (a clot lodging in a lung artery), which is life-threatening; early ultrasound and anticoagulation (blood thinners) prevent PE and stroke
5. Provide emotional support and private time to discuss fears about cancer, fertility loss, and sexual health; offer referral to social work, chaplain, or cancer support groups — Cervical cancer and HPV diagnosis carry stigma because HPV is sexually transmitted; many patients are young and face hysterectomy (removal of the uterus), which ends fertility and changes body image; psychological distress worsens treatment adherence and recovery, so early mental health support improves outcomes
6. Teach the patient and family about HPV transmission, the importance of vaccinating children and young adults, and that most HPV infections clear on their own without causing cancer — Patients often feel guilt or shame about HPV; understanding that 80 percent of sexually active people get HPV at some point reduces stigma; educating families about Gardasil 9 vaccination for ages 9 to 26 prevents future cancers in siblings and children, breaking the cycle
7. Coordinate care between gynecologic oncology, radiation oncology, and medical oncology; ensure the patient understands appointments for staging scans (CT, MRI, PET), colposcopy, or cone biopsy before treatment starts — Cervical cancer treatment depends on accurate staging (measuring how far cancer has spread); missing a biopsy or scan delays therapy and allows tumor growth; nurse navigation reduces confusion, improves appointment adherence, and ensures the multidisciplinary team has all information to plan surgery, radiation, or chemotherapy

8. Monitor for signs of infection (fever over 100.4°F, foul vaginal discharge, increased pelvic pain) especially after biopsy, LEEP, or cone procedure; give antibiotics as ordered and teach perineal hygiene — Cervical procedures create open wounds in a area exposed to vaginal bacteria; infection can spread to the uterus (endometritis) or bloodstream (sepsis), delaying cancer treatment; early antibiotic therapy and teaching patients to avoid tampons and sex for 2 to 4 weeks after procedures prevent complications

Sources

- NCCN Clinical Practice Guidelines in Oncology: Cervical Cancer 2023
- CDC: HPV and Cancer
- American Cancer Society: Cervical Cancer
- ACOG Practice Bulletin: Cervical Cancer Screening

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