PATIENT & CAREGIVER EDUCATION

High Dose Rate (HDR) Brachytherapy with Interstitial Implants for Treatment of Gynecologic Cancer

This information will help you get ready for your HDR brachytherapy (BRAY-kee-THAYR-uh-pee) with interstitial (IN-ter-STIH-shul) implants for treatment of gynecological cancers at Memorial Sloan Kettering (MSK).

Read through this resource at least once before your brachytherapy procedure and use it as a reference in the days leading up to your treatment. Bring it with you every time you come to MSK, including for your treatments. You and your healthcare team will refer to it throughout your care.

About Your Gynecological System

Your gynecological system includes your ovaries, fallopian tubes, uterus, cervix, and vagina. Your uterus is located in your lower abdomen (belly) between your bladder and rectum. The lower narrow end of the uterus is called the cervix (see Figure 1). Your ovaries and fallopian tubes are attached to your uterus.

About HDR Brachytherapy

Brachytherapy is a type of radiation therapy. Radiation therapy kills cancer cells by making it hard for them to multiply. During brachytherapy, a radiation source is placed directly into or next to a tumor.

With HDR brachytherapy, your healthcare provider will place an applicator, also
known as interstitial implantation device. The applicator will be placed in and around your vagina, cervix, or uterus. One end of the applicator will be implanted near the tumor during a surgery. The other end will be outside your body. There will be catheters (thin, flexible tubes) coming out of the applicator outside your body.

The radioactive source, which is Iridium-192, is stored in a separate unit. The outside end of the applicator will be connected to the radiation source through thin cables. Radiation will be guided through the applicator towards the tumor. After each treatment, the cables will be disconnected.

Most people get HDR after getting another type of radiation therapy called external beam radiation therapy. The HDR treatments begin about a week after the external beam radiation therapy is completed.

You’ll be admitted to the hospital for 2 days for your HDR treatment.

Use this space to write down your HDR brachytherapy treatment plan:
Your role on your radiation therapy team

You’ll have a team of healthcare providers working together to provide the right care for you. You’re part of the team, and your role includes:

- Arriving on time for your procedure.
- Asking questions and talking about your concerns.
- Telling someone on your radiation therapy team when you have side effects or pain.
- Caring for yourself at home.
  - Quitting smoking, if you smoke. If you want to quit, call our Tobacco Treatment Program at 212-610-0507.
  - Drinking liquids as instructed.
  - Eating the foods suggested by your radiation therapy team.
  - Maintaining your weight.

Getting Ready for Your Procedure

You and your healthcare team will work together to get ready for your procedure. Help us keep you safe during your procedure by telling us if any of the following statements apply to you, even if you aren’t sure.

- I take a blood thinner. Some examples are aspirin, heparin, warfarin (Coumadin®), clopidogrel (Plavix®), enoxaparin (Lovenox®), dabigatran (Pradaxa®), apixaban (Eliquis®), and rivaroxaban (Xarelto®). There are others, so be sure your healthcare provider knows all the medications you’re taking.
- I take prescription medications (medications prescribed by a healthcare provider), including patches and creams.
- I take over-the-counter medications (medications I buy without a prescription), including patches and creams.
- I take dietary supplements, such as herbs, vitamins, minerals, or natural or
home remedies.

- I have a pacemaker, automatic implantable cardioverter-defibrillator (AICD), or other heart device.
- I have sleep apnea.
- I’ve had a problem with anesthesia (medication to make you sleep during surgery) in the past.
- I’m allergic to certain medication(s) or materials, including latex.
- I’m not willing to receive a blood transfusion.
- I drink alcohol.
- I smoke.
- I use recreational drugs.

**Presurgical testing (PST)**

Before your procedure, you’ll have an appointment for presurgical testing (PST). The date, time, and location of your PST appointment will be printed on the appointment reminder from your healthcare provider’s office.

You can eat and take your usual medications the day of your PST appointment.

During your appointment, you’ll meet with a nurse practitioner (NP) who works closely with anesthesiology staff (specialized healthcare providers who will give you anesthesia during your surgery). Your NP will review your medical and surgical history with you. You may have tests, such as an electrocardiogram (EKG) to check your heart rhythm, a chest x-ray, blood tests, and any other tests needed to plan your care. Your NP may also recommend that you see other healthcare providers.

Your NP will talk with you about which medications you should take the morning of your surgery.

It’s very helpful to bring the following things to your PST appointment:
A list of all the medications you’re taking, including prescription and over-the-counter medications, patches, and creams.

Results of any tests done outside of MSK, such as a cardiac stress test, echocardiogram, or carotid doppler study.

The name(s) and telephone number(s) of your healthcare provider(s).

About drinking alcohol

The amount of alcohol you drink can affect you during and after your procedure. It’s important to talk with your healthcare providers about how much alcohol you drink. This will help us plan your care.

- If you stop drinking alcohol suddenly, it can cause seizures, delirium, and death. If we know you’re at risk for these complications, we can prescribe medications to help keep them from happening.
- If you drink alcohol regularly, you may be at risk for other complications during and after your procedure. These include bleeding, infections, heart problems, and a longer hospital stay.

Here are things you can do before your procedure to keep from having problems:

- Be honest with your healthcare providers about how much alcohol you drink.
- Try to stop drinking alcohol once your procedure is planned. If you develop a headache, nausea (feeling like you’re going to throw up), increased anxiety, or can’t sleep after you stop drinking, tell your healthcare provider right away. These are early signs of alcohol withdrawal and can be treated.
- Tell your healthcare provider if you can’t stop drinking.
- Ask your healthcare provider questions about drinking and your procedure. As always, all of your medical information will be kept confidential.

About smoking

If you smoke, you can have breathing problems when you have a procedure. Stopping even for a few days before your procedure can help. If you smoke, your
healthcare provider will refer you to our Tobacco Treatment Program. You can also reach the program by calling 212-610-0507.

About sleep apnea

Sleep apnea is a common breathing disorder that causes you to stop breathing for short periods of time while sleeping. The most common type is obstructive sleep apnea (OSA). With OSA, your airway becomes completely blocked during sleep. OSA can cause serious problems during and after your procedure.

Please tell us if you have sleep apnea or if you think you might have it. If you use a breathing device (such as a CPAP device) for sleep apnea, bring it with you the day of your procedure.

7 Days Before Your Procedure

Follow your healthcare provider’s instructions for taking aspirin

If you take aspirin or a medication that contains aspirin, you may need to change your dose or stop taking it 7 days before your procedure. Aspirin can cause bleeding.

Follow your healthcare provider’s instructions. **Don’t stop taking aspirin unless they tell you to.** For more information, read Common Medications Containing Aspirin, Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs), or Vitamin E (www.mskcc.org/pe/common_meds).

Stop taking vitamin E, multivitamins, herbal remedies, and other dietary supplements

Stop taking vitamin E, multivitamins, herbal remedies, and other dietary supplements 7 days before your procedure. These things can cause bleeding. For more information, read Herbal Remedies and Cancer Treatment (www.mskcc.org/pe/herbal_remedies).
2 Days Before Your Procedure

Stop taking nonsteroidal anti-inflammatory drugs (NSAIDs)

Stop taking NSAIDs, such as ibuprofen (Advil®, Motrin®) and naproxen (Aleve®), 2 days before your surgery. These medications can cause bleeding. For more information, read Common Medications Containing Aspirin, Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs), or Vitamin E (www.mskcc.org/pe/common_meds).

1 Day Before Your Procedure

Note the time of your procedure

A staff member from the Admitting Office will call you after 2:00 PM the day before your procedure. If your procedure is scheduled for a Monday, they'll call you on the Friday before.

The staff member will tell you what time to arrive at the hospital for your procedure. They'll also remind you where to go. If you don’t get a call by 7:00 PM, call 212-639-5014.

If you have any changes in your health or you need to cancel your procedure for any reason, call your radiation oncologist.

Follow a clear liquid diet

- You can have solid food for breakfast. Aim to finish your breakfast by 10:00 AM.
- After breakfast, start the clear liquid diet.
  - A clear liquid diet includes only liquids you can see through. Examples are listed in the “Clear Liquid Diet” table.
  - Try to drink at least 1 (8-ounce) glass of clear liquid every hour while you’re awake.
  - Drink different types of clear liquids. Don’t just drink water, coffee, and tea.
  - Don’t drink more than 2 cups (16 ounces) of liquids with caffeine.
Don’t drink diet liquids, even if you have diabetes. If you do, you may feel weak or dizzy.

- Drink 4 (8-ounce) glasses of clear liquids for lunch.

### Clear Liquid Diet

<table>
<thead>
<tr>
<th>Drink</th>
<th>Do Not Drink</th>
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</thead>
<tbody>
<tr>
<td><strong>Soups</strong></td>
<td></td>
</tr>
<tr>
<td>Clear broth, bouillon, or consommé</td>
<td>Any products with pieces of dried food or seasoning</td>
</tr>
<tr>
<td><strong>Sweets</strong></td>
<td></td>
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<tr>
<td>Gelatin (such as Jell-O®)</td>
<td>All others</td>
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<tr>
<td>Flavored ices</td>
<td></td>
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<tr>
<td>Hard candies (such as Life Savers®)</td>
<td></td>
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<tr>
<td><strong>Drinks</strong></td>
<td></td>
</tr>
<tr>
<td>Clear fruit juices (such as lemonade, apple, cranberry, and grape juices)</td>
<td>Juices with pulp</td>
</tr>
<tr>
<td>Soda (such as ginger ale, 7-Up®, Sprite®, and seltzer)</td>
<td>Nectars</td>
</tr>
<tr>
<td>Sports drinks (such as Gatorade®)</td>
<td>Milk or cream</td>
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<tr>
<td>Black coffee</td>
<td></td>
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<tr>
<td>Tea</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
</tr>
</tbody>
</table>

### The Night Before Your Procedure

- Take the medications your healthcare provider told you to take the night before your procedure. Take them with a small sip of water.

- Shower using soap and water the night before or the morning of your procedure.
Instructions for eating and drinking before your procedure

- Do not eat anything after midnight the night before your procedure. This includes hard candy and gum.
- Between midnight and up until 2 hours before your scheduled arrival time, you may drink a total of 12 ounces of water (see figure).
- Starting 2 hours before your scheduled arrival time, do not eat or drink anything. This includes water.

The Day of Your Procedure

Things to remember

- Take the medications your healthcare provider told you to take the morning of your procedure. Take them with a small sip of water.
- Don’t put on any lotion, cream, deodorant, makeup, powder, perfume, or cologne.
- Don’t wear any metal objects. Remove all jewelry, including body piercings. The equipment used during your procedure can cause burns if it touches metal.
- Leave valuable items (such as credit cards, jewelry, and your checkbook) at home.
- If you wear contact lenses, wear your glasses instead. If you don’t have glasses, bring a case for your contacts.

What to bring

- A pair of loose-fitting pants, such as sweatpants.
• Reading material, electronic devices, cell phone, and charger. You’ll be lying in bed most of the time you’re in the hospital, so having ways to pass the time will be helpful.

• Your breathing device for sleep apnea (such as your CPAP device), if you have one.

Where to park

MSK’s parking garage is located on East 66th Street between York and First Avenues. If you have questions about prices, call 212-639-2338.

To reach the garage, turn onto East 66th Street from York Avenue. The garage is located about a quarter of a block in from York Avenue, on the right-hand (north) side of the street. There’s a tunnel that you can walk through that connects the garage to the hospital.

There are also other garages located on East 69th Street between First and Second Avenues, East 67th Street between York and First Avenues, and East 65th Street between First and Second Avenues.

Where to go

Your procedure will take place at Memorial Hospital at 1275 York Avenue, between East 67th and East 68th Streets. Take the B elevator to the 6th floor to get to the Presurgical Center.

What to expect

You’ll be asked to say and spell your name and date of birth many times. This is for your safety. People with the same or a similar name may be having a procedure on the same day.

Get dressed for your procedure

When it’s time to change for your procedure, you’ll get a hospital gown, robe, and nonskid socks to wear.
Meet with a nurse
You’ll meet with a nurse before your procedure. Tell them the dose of any medications you took after midnight (including prescription and over-the-counter medications, patches, and creams) and the time you took them.

Your nurse may place an intravenous (IV) line in one of your veins, usually in your arm or hand. If your nurse doesn’t place the IV, your anesthesiologist will do it in the operating room.

Meet with an anesthesiologist
You’ll also meet with an anesthesiologist before your procedure. They will:

- Review your medical history with you.
- Ask you if you’ve had any problems with anesthesia in the past, including nausea or pain.
- Talk with you about your comfort and safety during your procedure.
- Talk with you about the kind of anesthesia you’ll get.
- Answer your questions about your anesthesia.

During your procedure
When it’s time for your procedure, you’ll either walk into the operating room or be taken in on a stretcher. A member of the operating room team will help you onto the operating bed. Compression boots will be placed on your lower legs. These gently inflate and deflate to help blood flow in your legs.

Once you’re comfortable, your anesthesiologist will give you anesthesia through your IV line and you’ll fall asleep. You’ll also get fluids through your IV line during and after your procedure.

After you’re fully asleep, a breathing tube will be placed through your mouth and into your windpipe to help you breathe. A urinary (Foley) catheter will also be placed to drain urine from your bladder.

Your healthcare provider will place the applicator with small, needle-like
catheters through your skin and into your vagina, cervix, or uterus. The exact location depends on where your HDR treatment will be delivered. Your healthcare provider will decide how many catheters are needed based on the size of the area being treated. The catheters will be held in place by a template (small piece of plastic with holes in it).

When all the catheters are inserted, you’ll have a magnetic resonance imaging (MRI) scan to make sure they’re in the right place. This scan will also help your healthcare provider finish the treatment planning process.

### HDR brachytherapy treatment

After your treatment plan is confirmed, you’ll probably have your first treatment while you’re still in the operating room under anesthesia. For your treatment, tubes will be connected to the catheters in your body to deliver the radiation. The tubes are connected to a machine that stores the radioactive source. Once everything is ready, the radiation will be delivered through the tubes and catheters.

After the radiation is delivered, the tubes will be disconnected from the catheters and the treatment will end.

### After Your Procedure

#### What to Expect

When you wake up after your procedure, you’ll be in the Post-Anesthesia Care Unit (PACU).

You’ll get oxygen through a thin tube that rests below your nose called a nasal cannula. A nurse will be monitoring your body temperature, pulse, blood pressure, and oxygen levels.

You’ll have a Foley catheter in your bladder to monitor the amount of urine you are making. You’ll also have compression boots on your lower legs to help your circulation.
You may have some pain after your procedure. Your healthcare providers will ask you about your pain often. You’ll have a pain pump called a patient-controlled analgesia (PCA) device. PCA uses a computerized pump to deliver pain medication into your IV or epidural space (in your spine). For more information, read the resource *Patient-Controlled Analgesia (PCA)* ([www.mskcc.org/pe/pca](http://www.mskcc.org/pe/pca)). If your pain isn’t relieved, tell one of your healthcare providers.

There isn’t anything radioactive in your needles between your treatments. You can have visitors and don’t have to be alone. Your visitors can see you briefly in the PACU, usually within 90 minutes after you arrive there. A member of the nursing staff will explain the guidelines to them.

After your stay in the PACU, you’ll be taken to your hospital room.

**While you’re in the hospital**

While the catheters are in place, you’ll need to lie still on your back in bed. You must stay in bed until the catheters are removed.

While you’re in bed, you’ll be able to raise the head of your bed a little bit, about 20 degrees. You won’t be able to move your hips or legs, but you can wiggle your toes. You’ll be able to move your arms and upper body.

You’ll be asked to do deep breathing exercises using your incentive spirometer. This helps your lungs expand, which prevents pneumonia. For more information, read the resource *How to Use Your Incentive Spirometer* ([www.mskcc.org/pe/incentive_spirometer](http://www.mskcc.org/pe/incentive_spirometer)).

You’ll follow a low-residue diet while you’re in the hospital. A low-residue diet has low amounts of fiber, which will help you have fewer bowel movements. You’ll also get medication to keep you from having a bowel movement. You may want to avoid eating foods that cause gas or make you feel bloated. You’ll eat all your meals in bed.

If you need any help, use your call bell to let a nurse know. The call bell is by the side of your bed.
We understand that lying still and flat in bed for several days can be challenging. You’ll be able to use your phone and other electronic devices, as well as read. You can also have visitors.

**Getting additional HDR Treatments**

You’ll receive 4 to 5 HDR treatments while you’re in the hospital. For each of your treatments, your bed will be moved from your room to the treatment area in the Department of Radiation Oncology.

For your treatments, your radiation therapists will attach tubes to the catheters in your body. The tubes look like long plastic straws. One end is connected to a machine that stores the radioactive sources, and the other is attached to the catheters in your body.

Once everything is ready, your radiation therapist will leave the room while you receive the HDR treatment. The room has a video camera, microphone, and speaker so your radiation therapists can see, hear, and talk to you at all times.

During the HDR treatment, the radiation source will move through the tubes into the catheters. You won’t feel any pain or discomfort while the source is in place. You won’t see or feel the radiation. You may hear a clicking sound from the HDR machine.

Your treatment will take about 10 to 20 minutes.

After your treatment is done, the radiation source is moved back into the machine. Your radiation therapist will come back and disconnect the tubes from the catheters.

The rest of your treatments will be done the same way each time. You’ll have them twice a day. Each treatment is given about 4 to 6 hours apart.

**After your last treatment**

After your last treatment, you’ll get medication to make you relaxed and sleepy. The applicator, template, and catheters will be removed once the medication takes
effect. You’ll then be brought back to your hospital room.

After the applicators, catheters, and template are removed, you may feel some cramping in your uterus and pressure in your vaginal area. These symptoms go away over a couple of hours. Ask your nurse for pain medication if you’re uncomfortable.

You may be discharged home that same day or early the next morning.

**Dilator therapy**

After HDR brachytherapy, your vagina may become dry, less elastic, narrower, and shorter. Together, these things are called vaginal stenosis. Before you go home, you’ll get instructions about how to use a vaginal dilator to help with these side effects.

Vaginal dilator therapy is a form of rehabilitation therapy you can use throughout your life. It will:

- Allow your healthcare provider to perform a more thorough pelvic exam.
- Make it more comfortable for you to be examined.
- Prevent your vagina from becoming too narrow.
- Keep your vagina more elastic.
- Allow you to have vaginal sex with less discomfort.

Your nurse will give you a vaginal dilator kit and explain how and when to use it. For more information, read the resource *How to Use a Vaginal Dilator* ([www.mskcc.org/pe/vaginal_dilator](www.mskcc.org/pe/vaginal_dilator)).

**After You Go Home**

After your treatment is finished, you aren’t radioactive and don’t need to follow any radiation precautions.

You may have cramping for a day after your last treatment. Once at home, you can
take ibuprofen (Advil® or Motrin ®) or acetaminophen (Tylenol®) as needed. Don’t take Vitamin E, aspirin, or products that contain aspirin for at least 1 week after your procedure.

You can resume your regular diet.

You can shower after you’re discharged from the hospital.

You can begin driving once you’re home, as long as you’re not taking any prescription pain medications that make you sleepy.

For 6 weeks after your treatment:

- Don’t take a bath or swim in a pool.
- Don’t lift anything heavier than 10 pounds (4.5 kilograms).
- Don’t put anything inside your vagina (such as tampons and douches) or have vaginal intercourse.

**Side Effects**

You may have side effects after your treatment. These side effects may last for 4 to 6 weeks.

If you need more help or support, contact the Female Sexual Medicine and Women’s Health Program at 646-888-5076.

**Vaginal bleeding**

You may have vaginal bleeding that looks like menstrual flow. This may last for up to a week.

Use sanitary pads for vaginal bleeding. Don’t use tampons.

**Vaginal dryness**

You may have vaginal dryness. This may last for the rest of your life.

Here is some information about vaginal moisturizers and when to start using
them.

Hydrating moisturizers

- HYALO GYN®
  - This moisturizer can be applied both inside of your vagina and on your vulva.
  - You can buy HYALO GYN online at www.hyalogyn.com

- Replens™ Long-Lasting Vaginal Moisturizer
  - This vaginal moisturizer can be inserted into your vagina with a disposable applicator or applied to your vulva.
  - You can buy Replens Long-Lasting Vaginal Moisturizer at your local pharmacy.

Soothing (natural oil) types

- Carlson® Key–E® Suppositories
  - These are suppositories (solid medications that dissolve) that you insert into your vagina with a disposable applicator. They work best if you use them at bedtime.
  - You can buy Carlson Key-E suppositories online at www.carlsonlabs.com

- Natural oils, such as vitamin E or coconut oil

Vaginal or anal irritation

Your vaginal or anal area may become irritated. Avoid rubbing the area, because it can lead to more irritation.

Use a warm wet cloth to cleanse the area,

Since you won’t be able to take baths for 6 weeks, you can buy a plastic sitz bath at your pharmacy. It fits over your toilet and lets you take sitz baths.

You can also buy a peri-bottle, which is a small plastic bottle with a squirt tip. You
can use to wash your vaginal or anal areas with warm water.

**When to Call Your Healthcare Provider**

Call your healthcare provider if you have:

- New or worsening chills
- A fever of 100.4 °F (38 °C) or higher
- Vaginal bleeding that’s more than light spotting
- Cloudy or foul smelling urine
- Blood in your urine
- More than 3 watery bowel movements a day that aren’t helped by medication.
- No bowel movement in 3 days
- Bleeding from your rectum
- Nausea or vomiting and are not able to keep food or liquids down.
- Abdominal or pelvic pain that doesn’t go away after you take your pain medication.
- New or worsening redness around a wound
- New or increased drainage from a wound
- New or worsening shortness of breath or difficulty breathing
- A heartbeat that is faster than usual
- New or worsening cough
- New or worsening pain
- New or worsening leg pain, or cramping
- New or worsening swelling in one or both legs, calves, ankles or feet
If you have any questions or concerns, talk with a member of your healthcare team. You can reach them Monday through Friday from 9:00 AM to 5:00 PM at the numbers listed below.

Radiation oncologist: _________________________
Phone number: _________________________

Radiation nurse: _________________________
Phone number: _________________________

After 5:00 PM, during the weekend, and on holidays, call 212-639-2000 and ask for the radiation oncologist on call.

For more resources, visit www.mskcc.org/pe to search our virtual library.

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