High-Dose Rate (HDR) Brachytherapy with Interstitial Implants for the Treatment of Gynecological Cancers

This information will help you prepare for your high dose rate (HDR) brachytherapy (brak-e-ther-ah-pe) with interstitial implants treatment 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 treatment.

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 doctor 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 will 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 will have a team of healthcare providers working together to provide the right care for you. You’re a 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 by your healthcare team.
  ○ Eating the foods suggested by your healthcare team.
  ○ Maintaining your weight.

**Before 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 doctor knows all the medications you’re taking.
• I take prescription medications, including patches and creams.
• I take any over-the-counter medications, 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 have had a problem with anesthesia (medication to make you sleep during surgery) in the past.
- I am allergic to certain medication(s) or materials, including latex.
- I am not willing to receive a blood transfusion.
- I drink alcohol.
- I smoke.
- I use recreational drugs.

**Presurgical testing (PST)**

Before your procedure, you will 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 radiation oncologist’s office. You can eat and take your usual medications the day of your PST appointment.

During your appointment, you will meet with a nurse practitioner (NP) who works closely with anesthesiology staff (doctors and specialized nurses who will give you medication to put you to sleep during your procedure). Your NP will review your medical and surgical history with you. You will have tests,
including an electrocardiogram (EKG) to check your heart rhythm, a chest x-ray, blood tests, and any other tests necessary to plan your care. Your NP may also recommend you see other healthcare providers.

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

It’s very helpful if you bring the following with you to your PST appointment:

- A list of all the medications you’re taking, including 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 doctor(s).

**About drinking alcohol**

The amount of alcohol you drink can affect you during and after your procedure. It’s important that you talk with your healthcare providers about your alcohol intake so that we can plan your care.

- Stopping alcohol suddenly can cause seizures, delirium, and death. If we know you’re at risk for these complications, we can prescribe medication to help prevent them.
- If you use alcohol regularly, you may be at risk for other complications during and after your procedure. These include
bleeding, infections, heart problems, and longer hospital stay.

Here are things you can do to prevent problems before your procedure:

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

About smoking
People who smoke can have breathing problems when they have a procedure. Stopping even for a few days before your procedure can help. If you smoke, your nurse will refer you to our Tobacco Treatment Program. You can also reach the program at 212-610-0507.

About sleep apnea
Sleep apnea is a common breathing disorder that causes a person to stop breathing for short periods of time while sleeping. The
most common type is obstructive sleep apnea (OSA). With OSA, the airway becomes completely blocked during sleep. It 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 machine (such as a CPAP) for sleep apnea, bring it with you the day of your procedure.

10 days before your procedure
Stop taking vitamin E
If you take vitamin E, stop taking it 10 days before your procedure, because it can cause bleeding. For more information, read *Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs)* or search for it on www.mskcc.org/pe

7 days before your procedure
Stop taking certain medications
If you take aspirin, ask your doctor if you should continue. Aspirin and medications that contain aspirin can cause bleeding. For more information, read *Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs)*.

Stop taking herbal remedies and supplements
Stop taking herbal remedies or supplements 7 days before your procedure. If you take a multivitamin, ask your doctor or nurse if
you should continue. For more information, read *Herbal Remedies and Cancer Treatment* or search for it on www.mskcc.org/pe

2 days before your procedure
Stop taking certain medications

Stop taking nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Advil®, Motrin®), and naproxen (Aleve®) 2 days before your procedure. These medications can cause bleeding. For more information, read *Common Medications Containing Aspirin and Other Nonsteroidal Anti-inflammatory Drugs (NSAIDs).*

1 day before your procedure
Note the time of your procedure

A clerk 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 will call you the Friday before.

The clerk will tell you what time you should arrive at the hospital for your procedure. They will also remind you where to go on the day of your procedure.

If you don’t receive 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 table below.
  - Be sure to drink plenty of liquids other than water, coffee, and tea. Try to drink at least 1 (8-ounce) glass of clear liquid every hour while you’re awake.

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

- 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.

### Clear liquid diet

<table>
<thead>
<tr>
<th>Food and drink</th>
<th>Drink</th>
<th>Do not drink</th>
</tr>
</thead>
</table>
| Soups          | • Clear broth or bouillon  
                 • Clear consommé  
                 • Packaged vegetable, chicken, or beef broth-mix without any particles of dried herbs or seasonings | All others |

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| Sweets and Desserts                  | • Gelatin  
• Flavored ices  
• Sugar  
• Honey  
• Sugar substitutes | All others |
|-------------------------------------|-----------------------------------------------|
| Beverages                           | • Clear fruit juices such as apple, cranberry, grape, orange  
• Soda such as ginger ale, 7-Up®, Sprite®, seltzer, cola  
• Gatorade®  
• Black coffee  
• Tea  
• Water | All others including  
• Juices with pulp  
• Nectar  
• Milk or cream  
• Alcoholic beverages |

**The night before your procedure**

- Take the medications that your nurse or doctor 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 the Procedure

Things to remember

- Take the medications your doctor or NP 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 valuables such as credit cards, jewelry, or 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 will be lying in bed most of the time that you’re in the hospital so having ways to pass the time will be helpful.
- Your breathing machine for sleep apnea (such as your CPAP), if you have one.

**Parking when you arrive**

MSK’s parking garage is located on East 66th Street between York and First Avenues. For 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 is a pedestrian 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
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 will be asked to state 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 as you.

When it’s time to change for your procedure, you’ll get a hospital gown, robe, and nonskid socks to wear.

You will meet with your nurse before your procedure. Tell them the dose of any medications (including patches and creams) you took after midnight and the time you took them.

Your nurse may place an intravenous (IV) catheter into a vein, usually in your hand or arm. The IV line will be used to give you fluids and anesthesia during your procedure. If your nurse doesn’t place the IV, your anesthesiologist will do it later once you’re in the operating room.

You will also meet with your anesthesiologist before your procedure. Your anesthesiologist will:
• Review your medical history with you.
• Talk with you about your comfort and safety during your procedure.
• Talk with you about the kind of anesthesia you will receive.
• Answer any questions you may have about your anesthesia.

**During your procedure**

When it’s time for your procedure, you will 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 the circulation in your legs.

Once you’re comfortable, your anesthesiologist will give you anesthesia through your IV. When you’re fully asleep, a breathing tube will be placed through your mouth into your windpipe to help you breathe. You will also have a urinary (Foley®) catheter placed to drain urine from your bladder.

Your doctor 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 doctor will decide how many catheters are needed based on the size of the area that’s being treated. The catheters will be held in place by a template, which is a small piece of plastic with holes in it.
When all of the catheters are inserted, you will have a magnetic resonance imaging (MRI) scan to make sure they’re in the right place. This scan will also help your doctor finish the treatment planning process.

**During your HDR treatment**
After your treatment plan is confirmed, you will 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 will be in the Post-Anesthesia Care Unit (PACU).

You will 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 will have a Foley catheter in your bladder to monitor the
amount of urine you are making. You will also have compression boots on your lower legs to help your circulation.

You may have some pain after your procedure. Your doctor and nurse will ask you about your pain often. You will 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 Patient-Controlled Analgesia (PCA). If your pain isn’t relieved, tell your doctor or nurse.

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 will be taken to your hospital room.

**While you’re in the hospital**

While the catheters are in place, you will 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 will 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 will be able to move
your arms and upper body.

You will be asked to do deep breathing exercises using your incentive spirometer. This helps your lungs expand, which prevents pneumonia. For more information, read *How to Use Your Incentive Spirometer*. You can search for it on www.mskcc.org/pe or ask your nurse for it.

You will 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 will 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 will eat all of 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 will be able to use your phone and other electronic devices, as well as read. You can also have visitors.

**Getting additional HDR Treatments**

You will 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 will have them twice a day. Each treatment is given about 4 to 6 hours apart.

**After the last treatment**
After your last treatment, you will get medication to make you relaxed and sleepy. The applicator, template, and catheters will be removed once the medication takes effect. You will 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 will 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, ask your nurse for the resource *How to Use a Vaginal Dilator* or search for it on www.mskcc.org/pe

**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.

Call Your Doctor or Nurse if You Have:

- New or worsening chills
- A temperature 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

Contact Information

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: ____________________ Number
____________________

Radiation nurse:______________________ Number
__________

After 5:00 PM, during the weekend, and on holidays, call 212-639-2000 and ask for the radiation oncologist on call.
If you have any questions, contact a member of your healthcare team directly. If you're a patient at MSK and you need to reach a provider after 5:00 PM, during the weekend, or on a holiday, call 212-639-2000.

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

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