

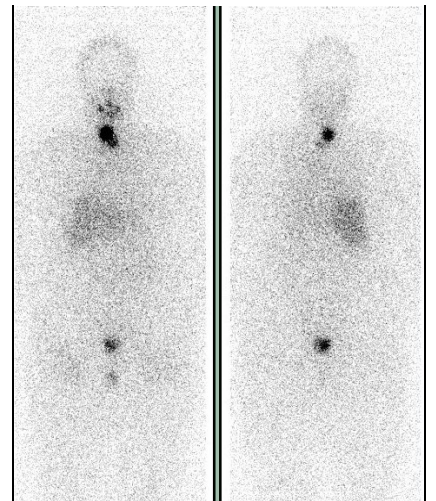
## I-131 放射性碘治疗甲状腺癌

### 治疗的过程及如何准备

本手册为将要接受放射性碘治疗甲状腺癌的患者提供一些资讯。

### 放射性碘是什么？

放射性碘(也称为碘-131 或 I-131)是我们用来治疗甲状腺癌的一种物质。甲状腺癌和甲状腺组织都会吸收碘。这有助于我们发现和治疗甲状腺癌的活动区域。



图像中的深色区域显示了人体吸收或释放 I-131 的地方。

### 治疗的过程如何？

我们会要求患者吞服一粒含有碘-131 的胶囊。它很快就进入血液。甲状腺和任何甲状腺癌组织就会吸收血液中的碘-131。

碘-131 在甲状腺组织中会释放出微小的  $\beta$  粒子。这些粒子会进入非常接近它们释放位置附近的甲状腺组织或癌症部位（离释放位置约 1 毫米范围内）。

$\beta$  粒子会破坏组织,这种破坏将导致甲状腺和任何甲状腺癌细胞随着时间而死亡。治疗后需要长达几个月的时间才会达到完全的效果。

碘-131 还发出伽马射线（类似 X 光射线），可以用特殊的核医学造影机看到。这可以让我们看到碘-131 所治疗的肿瘤。

大部分没有被吸收的碘-131 会在接下来的 24 到 48 小时内经尿液排出体外。被甲状腺或甲状腺癌细胞吸收的碘-131 会在体内停留较长的时间。



使用您的手机摄影机扫描此二维码，可获取此讲义的电子副本。

## 治疗的步骤?

在接受碘-131 治疗之前，须先做**甲状腺癌测量**。请阅读"使用碘-123 的甲状腺癌检测 "或 "使用碘-131 的甲状腺癌剂量测定 "等讲义。

如患者是做残留甲状腺组织或甲状腺癌残留部位的治疗：

- 患者将在甲状腺癌检测扫描的当天或 3 天内回到核医学科。届时，需吞服 1 粒或更多含有碘-131 的小胶囊。
- 碘-131 治疗可以在门诊做。治疗后身体及体液中会有放射性。根据生活空间的不同,有时很难保护患者家里其他人员不受辐射影响。如患者在家里很难遵守安全预防措施，就可以住在医院或西雅图癌症中心的住宿（Fred Hutch House）。我们会和患者讨论以做最适合的安排。

## 关于 I-131 治疗，我应该知道什么？

这种治疗有一些副作用。您可能会有：

- 恶心
- 颈部和唾液腺疼痛
- 持续 2-3 周口里有金属味

我们会提供一些缓解这些症状的建议。如在医院过夜，我们会治疗这些症状。如患者在治疗后回家，我们会开止吐药的处方。

## 如患者是一个育龄妇女

- 在服用碘-131 之前，**必须先做妊娠血液测试**。
- 对怀孕的患者我们**不能**给予放射性碘，因为它会伤害到未出生的婴儿。即使不计划完成妊娠、患者也必须告诉我们是否怀孕。
- **正在哺乳的患者也请告诉我们**。如是母乳喂养，就不能接受碘-131 治疗。辐射会聚集在乳液中并传递给宝宝。也会使乳房组织接受到乳汁中碘-131 的额外辐射。
  - 在服用碘-131 剂量之前，**必须**停止母乳喂养 3 个月。
  - 即使在完成治疗后，也**决不可以**母乳喂养正在哺乳的婴儿。

## 低碘的饮食

患者必须在本次测量前一周遵守低碘饮食的规则。有关说明，请上网：[www.thyca.org/pap-fol/lowiodinediet](http://www.thyca.org/pap-fol/lowiodinediet)。如不使用互联网，请向我们索取一份打印件。

## 服用放射性碘-131 的当天

### 在家

- 在服药前后 **2 小时内**，除了水以外，**不要吃任何固体食物或喝任何东西。**
- 在服用碘-131 前 2 小时前或更早，您可以在来医院前吃早餐。
- 喝水是可以的。

### 来医院时应该携带些什么？

- 必须携带 2 种身份证明，包括至少 1 种带有照片的身份证明，如驾驶执照。
- 如在服药后将入住医院或西雅图癌症中心的住宿 Fred Hutch 之家：
  - 携带平时服用的所有药物
  - 携带衣服、个人卫生用品、零食和其他必需品。
  - 可以携带个人专用的笔记本电脑、手机和其他电子设备。如带了这些电子用品，请勿与他人共用，可用塑料袋盖住它们，以防止暴露在有放射性的物质中。
  - 患者可以戴结婚戒指、眼镜和隐形眼镜。
  - 可以携带个人医疗设备。

### 应留在家中的物件

- **请勿携带个人的贵重物品。**
- **请勿携带与他人共用的笔记本电脑、手机和其他电子设备。**

### 来报到时

- 如您是按排在华大医疗中心接受碘-131 的治疗，请按预定时间到放射科前台报到。如您是安排在 西雅图癌症中心请按预约的时间到核医科报到。
- 如甲状腺癌测量与服用治疗剂量碘-131 是在同一天：

- 首先做测量
- 将与核医学医生见面，有时也会与辐射安全人员见面。他们会和患者讨论治疗和辐射安全问题。他们和开碘-131 治疗处方的医生一起，根据扫描的结果来决定碘-131 的剂量。
- 在决定了碘-131 剂量后，我们会从西雅图的放射药房订购医生所定制剂量。这个剂量可能需要几个小时的时间来准备和送达。
- 如为门诊治疗，则需在扫描后几个小时返回核医学科。核医学科的医生会在这个时候给您服用 I-131 的剂量。

## 住院

如患者在华大医疗中心 UWMC 治疗后安排在医院过夜：

- 中午 12 点左右到华大 UWMC 三楼大厅的入院部前台报到，在询问台的后面。
- 计划可能会在医院停留 3 天。
- 可能会在下午接受碘-131 的治疗。

病房是在 6 楼或 7 楼。它看起来和其他医院的房间一样，但它是特别设计可防止辐射。房门是开着的，但访客不可进入房间。他们可以给患者送东西，也可在门口与患者交谈。

## 服药后

### 饮食

- **服用胶囊后 2 小时内：**切勿吃任何食物。空腹有助于身体吸收放射性碘。仅喝水。
- **在治疗后的 1 到 2 天内。**避免吃油腻的食物，以减轻恶心感。对于胃不适者，可以服用普通胃灼热药（H2 阻滞剂）或普通 *质子泵抑制剂 generic proton pump inhibitor*（PPI）来减轻胃部不适。您可以在药店购买这些药物无需处方。
- **在治疗后的 3 天内。**遵循低碘的饮食规则。3 天后可以恢复正常饮食。

### 其他的规则

- 在治疗后的 24 小时内：
  - 治疗随后至少 3 天内，每小时最少喝 1 杯（8 盎司）水或果汁等透明的饮料。

- 每次小便后马桶要冲 **2** 次。
- 在治疗后的 **8 至 12 小时内**。每隔一小时就要排空膀胱。
- 治疗后的**第一个晚上**。至少要起来排一次尿，以后就不需要这样做。
- 治疗**一周内**：定期排便是很重要的，可以清除结肠中的碘-131。当甲状腺激素水平低时，经常会发生便秘。在遵循低碘饮食期间如发生便秘，可以使用大多数非处方泻药。如果您有任何疑问，请向我们咨询有关便秘和泻药的问题。

## 服药后的安全防范措施

### 防辐射的措施

务必在以下所示天数内遵循每项辐射预防措施。

服用碘-131 后	持续的时间
切勿乘坐飞机或其他公共交通工具，如公共汽车或火车。	3 天
切勿与他人一起乘坐超过 4 小时的汽车旅行。	3 天
睡眠时需单独睡，与其他成年人至少有 6 英尺的距离。	可达 6 天 (因剂量而异)
睡眠时需单独睡，与孕妇、婴儿、或孩童至少保持 6 英尺的距离。	7 至 14 天 (因剂量而异)
与所有成年人保持至少 3 英尺的距离。只允许短暂的近距离接触。	4 天

与孕妇、婴儿和幼儿至少保持 6 英尺的距离。	7 至 14 天 (因剂量而异)
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### 基本体液预防措施

这些预防措施有助于保护他人免受患者的唾液及其他体液的影响。根据生活状况，可能需要遵循更多的预防措施。

服用碘-131 后	持续的时间
使用的浴室应该是只供患者使用。他人不得使用。(如家中只有成年人，也可不受此限。)	2 天
<ul style="list-style-type: none"> <li>• 切勿与任何人共用餐具、玻璃杯或茶杯、盘子或食</li> <li>• 患者使用的所有餐具、玻璃杯、茶杯和碗碟与其他脏盘分开冲洗。冲洗后，可与其他餐具和碗筷一起放入洗碗机清洗。</li> <li>• 切勿使用一次性的盘子、餐具或杯子。</li> <li>• 切勿让他人处理患者的衣物、被褥或其他可能含有汗液、血液或尿液的物品。</li> <li>• 切勿让他人清理或处理患者的任何体液，如呕吐物、尿液或血液。</li> </ul>	4 天
避免接吻、性交和其他亲密接触。	7 天
勤洗手。使用肥皂和温水冲洗至少 20 秒。	7 天

### 育龄妇女

- 服用碘-131 治疗后 **1 年内不要怀孕**。这是因为有时患者需要再次接受碘-131 治疗。另外，甲状腺替代药物水平必须调整并稳定后才能怀孕。
- 如您正在母乳喂养：
  - 必须停止母乳喂养当前的婴儿。碘-131 可能会伤害婴儿。

- 治疗后切勿恢复母乳喂养
- 将来，如选择再次怀孕，那时可以开始母乳喂养。

## 复诊

- 患者接受碘-131 治疗后的几天里，可能需要**抽血**检查。请咨询护理团队。
- 在服用碘-131 后 7 至 10 天，需做**甲状腺癌后续测量**。我们将拍摄身体的图像，以了解碘-131 聚集的部位。这次预门诊将需 1 至 2 小时。患者不需要为这次测量做准备。
- 需在治疗后 **4 至 6 周见内分泌医生复诊**。这是甲状腺激素水平变得稳定的最快时间。内分泌学家将监测甲状腺激素补充剂的剂量。请务必遵守这次预约。我们可以帮助安排这次门诊。
- 可能需要在 **6 到 12 个月**后做**碘-131 诊断性甲状腺癌测量**。如有需要，内分泌医生会推荐做这次扫描。

## 如需要更多的资讯

要了解有关放射性碘-131，以及它是如何用于治疗甲状腺癌的更多资讯；请访问甲状腺癌克服者协会的网站：[www.thyca.org](http://www.thyca.org)

## 与谁联系

诊所或部门	办公时间	下班后及周末假日
UWMC - Montlake Imaging Services 华大医疗中心—蒙特湖院区 造影科	206.598.6200	请致电 206.598.6190，请 传呼接线生传呼核 医科的当值住院医 生。
UWMC - Montlake Nuclear Medicine 华大医疗中心—蒙特湖院区 核医科	206.598.4240	

### 您有疑问吗？

我们很重视您的提问。当您有疑问或顾虑时，请致电您的医生或医护提供者。

请参阅本讲义“与谁联系”所提供的华大医疗中心及西雅图癌症中心的电话号码及下班后的联系方式。



## I-131 Radioactive Iodine to Treat Thyroid Cancer

### *What to expect and how to prepare*

*This handout gives instructions for patients who will receive radioactive iodine to help treat thyroid cancer.*



*Scan this QR code with your phone camera for a digital copy of this handout.*

### What is radioactive iodine?

*Radioactive iodine* (also called Iodine-131 or I-131) is one substance we use to treat thyroid cancer. Both thyroid cancer and thyroid tissue absorb iodine. This helps us find and treat areas of active thyroid cancer.

### How does it work?

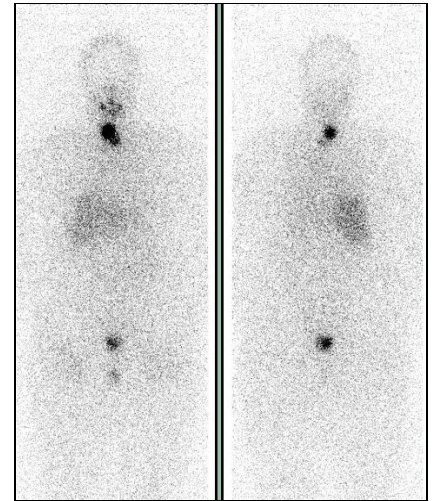
We will ask you to swallow a capsule that contains I-131. It will enter your bloodstream very quickly. Your thyroid gland and any thyroid cancer tissue will absorb the I-131 from your blood.

The I-131 in your thyroid tissue will give off tiny *beta particles*. These particles will enter your thyroid tissue or cancer sites, very close to where they are given off (within about 1 millimeter).

The beta particles damage tissue, and this damage will cause your thyroid gland and any thyroid cancer cells to die over time. It takes up to a few months for this treatment to have its full effect.

I-131 also gives off *gamma rays* (like X-rays), which can be seen with special Nuclear Medicine cameras. This allows us see which tumors the I-131 is treating.

Most of the I-131 that is not absorbed will leave your body in your urine over the next 24 to 48 hours. The I-131 absorbed by your thyroid or thyroid cancer will stay in your body longer.



*The dark areas in these images show where the body has absorbed or excreted I-131.*



## What can I expect?

Before you have I-131 therapy, you must have a **thyroid cancer survey**. (Please read the handout “Thyroid Cancer Survey Using I-123” or “Thyroid Cancer Dosimetry Using I-131.”)

If you are having treatment for residual thyroid tissue or residual sites of thyroid cancer:

- You will return to Nuclear Medicine either on the same day or within 3 days of your thyroid cancer survey scan. At that time, you will swallow 1 or more small capsules that contain I-131.
- I-131 treatment can be done as an outpatient procedure. There will be radiation in your body and body fluids after the procedure. It can be hard to protect other people in your home from the radiation, depending on your living situation. You may stay in the hospital or Fred Hutch House if safety precautions will be hard to follow at home. We will talk with you about what will work best for you.

## What should I know about I-131 treatment?

This treatment has some side effects. You may have:

- Nausea
- Soreness in your neck and salivary glands
- A metallic taste in your mouth for up to 2 to 3 weeks

We will give you tips to ease these symptoms. If you stay overnight in the hospital, we will treat these symptoms. If you go home after your treatment, we will give you prescriptions for anti-nausea medicine.

## If You Are a Woman of Childbearing Age

- You **must** have a pregnancy blood test before taking I-131.
- If you are pregnant, we **cannot** give you radioactive iodine, since it would harm your unborn baby. You must tell us if you are pregnant, even if you do not plan to complete the pregnancy.
- **Tell us if you are breastfeeding.** If you are breastfeeding, you **cannot** have I-131 therapy. The radiation would collect in your breast milk and pass to your child. It would also expose your breast tissue to extra radiation from the I-131 in the milk.
  - **You must stop breastfeeding for 3 months before you take your I-131 dose.**

- You must **never breastfeed** your current infant in the future, even after you are done with your treatment.

## Low-iodine Diet

You must be on a **low-iodine diet** for 1 week before this survey. For instructions, please visit [www.thyca.org/pap-fol/lowiodinediet](http://www.thyca.org/pap-fol/lowiodinediet). If you do not use the internet, ask us for a printed copy.

## Day of Your I-131 Dose

### At Home

- **For 2 hours before and after your dose**, do **not** eat any solid foods or drink anything but water.
- You may have breakfast before you come to the hospital, **if** it is more than 2 hours before your I-131 dose.
- It is OK to drink water.

### What to Bring with You

- You must have 2 forms of ID, including at least 1 with your photo, such as a driver's license.
- If you will be staying in the hospital or Fred Hutch House after your dose:
  - Bring any medicines you usually take.
  - Bring clothes, personal hygiene items, food, and other essentials.
  - You may also bring your laptop, cell phone, and other electronic devices, if other people do not use them. If you bring these things, you can cover them with plastic to keep them from being exposed to the radioactive material.
  - You may wear your wedding ring, eyeglasses, and contact lenses.
  - You may bring personal medical devices.

### What to Leave at Home

- Do **not** bring valuable personal items.
- If other people use your laptop, cell phone, or other electronic devices, do **not** bring them with you.

## When You Arrive

- Go to Nuclear Medicine at your scheduled time.
- If your thyroid cancer survey is on the same day as your I-131 dose:
  - You will have the survey first.
  - You will meet with a Nuclear Medicine doctor and sometimes with the Radiation Safety officer. They will talk with you about your treatment and radiation safety. They will work with the doctor who prescribed your I-131 treatment to decide how much I-131 to order. This will be based on your scan results.
  - After your I-131 dose is decided, we will order your custom dose from the radiopharmacy in Seattle. It can take a few hours for this dose to be prepared and delivered.
  - If you will not be staying overnight the hospital, or your appointments are scheduled at Fred Hutch, we will ask you to return to Nuclear Medicine a few hours after your scan. A Nuclear Medicine doctor will give you your I-131 dose at this time.

## Inpatients

If you will be staying overnight in the hospital after your treatment at UWMC:

- Check in at about 12 noon at Admitting Reception in the lobby on the main (3rd) floor of UWMC, just behind the Information Desk.
- Plan to stay in the hospital up to 3 days.
- You will likely receive your I-131 dose in the afternoon.

Your room will be on the 6th or 7th floor. It will look like other hospital rooms, but it was specially designed to protect against radiation. Your door will be open, but visitors may **not** enter the room. They can bring you items and talk with you from the doorway.

## After Your Dose

### Diet

- **For 2 hours after you swallow the capsule:** Do **not** eat any food. An empty stomach helps your body absorb the radioactive iodine. Drink **only** water.

- **For 1 or 2 days after your treatment:** Avoid fatty or rich foods to help ease any nausea. For an upset stomach, you may take a generic heartburn medicine (H2 blocker) or generic *proton pump inhibitor* (PPI). You can buy these at a drugstore without a prescription.
- **For 3 days after your treatment:** Follow your low-iodine diet. You may resume your normal diet after 3 days.

### Other Guidelines

- **For 24 hours** after your treatment:
  - **Drink at least 1 glass (8 ounces) of clear fluid such as water or juice every hour.** Keep drinking plenty of clear fluids such as water or juice for at least the first 3 days.
  - **Flush the toilet 2 times** every time after you urinate.
- **For 8 to 12 hours** after your treatment: Empty your bladder every hour.
- **The first night** after your treatment: Get up at least once during the night to empty your bladder. After the first night, you do not need to do this.
- **For 1 week** after your treatment: It is important to have regular bowel movements after your treatment to clear the I-131 from your colon. Constipation often occurs when your thyroid hormone is low. If you have any constipation, it is OK to use most over-the-counter laxatives while you are on a low-iodine diet. Ask us about constipation and laxatives if you have any questions.

## Safety Precautions After Your Dose

### Radiation Precautions

Follow each radiation precaution for the number of days shown.

After your I-131 dose	For this long
Do <b>not</b> travel by airplane or other public transportation such as a bus or train.	3 days
Do <b>not</b> travel on car trips longer than 4 hours with others in the car.	3 days
Sleep in a separate bed, at least 6 feet away from other adults.	Up to 6 days (depends on dose)

After your I-131 dose	For this long
Sleep in a separate bed, at least 6 feet away from pregnant women, infants, or children.	7 to 14 days (depends on dose)
Stay at least 3 feet away from all adults. Allow only short periods of closer contact.	4 days
Stay at least 6 feet away from pregnant women, infants, and young children.	Up to 7 days (depends on dose)

### Basic Body Fluid Precautions

These precautions will help protect others from your saliva and other body fluids. You may need to follow more precautions based on your living situation.

After your I-131 dose	For this long
The bathroom you use should be for your use <b>ONLY</b> . No one else should use it. ( <i>Exceptions can sometimes be made if there are only adults in your household.</i> )	2 days
<ul style="list-style-type: none"> <li>• Do <b>NOT</b> share utensils, glasses or cups, plates, or food with anyone, <b>especially children</b>.</li> <li>• Do <b>not</b> let others handle your dishes or utensils.</li> <li>• Rinse all of the utensils, glasses, cups, and dishes you use apart from other dirty dishes. After they are rinsed, they can be washed in a dishwasher with other dishes and utensils.</li> <li>• Do <b>not</b> use disposable plates, utensils, or cups.</li> <li>• Do <b>not</b> let others handle your laundry, bedding, or other items that may contain sweat, blood, or urine.</li> <li>• Do <b>not</b> let others clean up or handle any of your body fluids, such as vomit, urine, or blood.</li> </ul>	4 days
Avoid kissing, having sex, and other intimate contact.	7 days
Wash your hands well and often. Use soap and warm running water for at least 20 seconds.	7 days

## Women of Childbearing Age

- **Do not get pregnant for 1 year after your I-131 treatment.** This is in case you need to be treated with I-131 again. Also, your thyroid replacement medicine level must be adjusted and stable before you get pregnant.
- **If you are breastfeeding:**
  - You **must stop breastfeeding** your current infant. I-131 can harm your baby.
  - Do **not** resume breastfeeding with your infant after treatment.
  - In the future, if you choose to become pregnant again, you may start breastfeeding at that time.

## Follow-Up Visits

- You may need to have a **blood draw** for lab tests in the days after your I-131 therapy. Check with your care team.
- You will have a **follow-up thyroid cancer survey** 7 to 10 days after your I-131 dose. We will take images of your body to see where the I-131 dose collected. This appointment will last 1 to 2 hours. You do not need to prepare for this survey.
- You will need a **follow-up visit with your endocrinologist** 4 to 6 weeks after your treatment. This is the soonest we would expect your thyroid hormone levels to become stable. Your endocrinologist will monitor your thyroid hormone replacement dose. Be sure to keep this appointment. We can help you schedule this visit.
- You may need a **follow-up I-131 diagnostic thyroid cancer survey** in 6 to 12 months. If you do, your endocrinologist will refer you for this scan.

## To Learn More

To learn more about I-131 radioactive iodine and how it is used to treat thyroid cancer, visit the Thyroid Cancer Survivor's Association website: [www.thyca.org](http://www.thyca.org)

## Who to Call

Clinic or Department	During office hours	After hours and on weekends and holidays
UWMC - Montlake Imaging Services	206.598.6200	Call 206.598.6190 and ask to page the Nuclear Medicine Resident on call.
UWMC - Montlake Nuclear Medicine	206.598.4240	

### Questions?

Your questions are important. Call your doctor or healthcare provider if you have questions or concerns.

See “Who to Call” on this page for UWMC and Fred Hutch phone numbers and how to get help after hours.