

IMAGING TESTS

This information may help answer some of your questions and help you think of other questions that you may want to ask your cancer care team; it is not intended to replace advice or discussion between you and your cancer care team.

Imaging tests allow the cancer care team to check for cancer and other problems inside the body.

- Imaging tests involve sending different types of energy, such as X-rays, sound waves, magnetic fields or radioactive particles, through the body.
- Energy patterns are changed by the different tissues and structures in the body and these are displayed as an image on a screen. They allow the cancer care team to see changes that may be caused by cancer.

There are four main types of imaging used to diagnose and assess head and neck cancers:

- **Ultrasound (US) scans:** A probe is placed on the skin surface that uses sound waves to look in detail at soft tissues of the body. Ultrasound usually looks at smaller regions like the thyroid gland. It is not used for looking at bone or tissue with air in or around it, like the lungs. Ultrasound does not use radiation and is safe during pregnancy and for children.
- **Computed tomography (CT) scans:** X-ray beams are used to create a detailed view of the body. CT can look at large areas of the body very quickly and is very good for examining bone. Intravenous dye is often used to help show blood vessels and cancers during a CT scan. CT scans use radiation and should be avoided during pregnancy and in children where possible.

- **Magnetic resonance imaging (MRI) scans:** A very strong magnetic is used to create a detailed view of the body. MRI scans can look at large areas of the body but they are quite slow and noisy. Many people also find them claustrophobic. MRI is very good for looking at many different types of tissue but it is important to lie very still during the scan. Intravenous dye is often used to help show blood vessels and cancers during an MRI scan. MRI can be dangerous in people with metal in their body because the magnet can make the metal move – let the radiographer know if you do but not all types of metal are affected. MRI does not use radiation and is safe during pregnancy and for children.
- **Positron emission tomography (PET) scans:** A special glucose solution containing some radioactive material (known as a radiotracer) is injected into the body. The radiotracer accumulates in the cells that use more energy, including cancer cells, making these show up as ‘hot spots’ on the images. PET scans are very good at detecting cancers that grow quickly but not ones that grow slowly. PET scans can also give false readings due to inflammation or muscle movement (even talking or chewing). PET uses radiation and should be avoided during pregnancy and in children where possible.

WHY ARE IMAGING TESTS NEEDED?

Imaging tests can be used to:

- **look for cancer**
- **see out how far your cancer has spread (known as staging)**
- **help determine which treatment, or combination of treatments, might be right for you**
- **help track whether cancer treatment is working.**

HOW TO PREPARE FOR IMAGING TESTS

Imaging tests are usually painless and do not require special preparation. If you are having intravenous dye or a biopsy, a needle will be required.

BEFORE AN ULTRASOUND OR CT, GUIDED BIOPSY LET THE RADIOLOGIST KNOW IF YOU:

- Take blood thinning medication for a heart condition or blood clots (such as warfarin, Plavix, aspirin or Pradaxa), make sure the cancer care team is aware. Some of these medications may need to be stopped more than a week before imaging.
- Have a bleeding problem.

BEFORE A CT SCAN LET THE RADIOGRAPHER KNOW IF YOU:

- Have had problems with any contrast used in imaging tests in the past. Also let them know if you have previously had any reactions to seafood or iodine, or any other allergies. This is important because previous reactions may increase your risk of reacting to the contrast material used in imaging scans.
- Have any kidney problems; you may also need to have blood tests to check your kidney function. This is because the contrast material may affect your kidneys.
- Are pregnant, think you are pregnant, or are breastfeeding.

BEFORE A PET SCAN LET THE NUCLEAR MEDICINE SPECIALIST KNOW IF YOU:

- Have diabetes; you may need to follow a different procedure for a PET scan. This is because the radiotracer contains glucose.
- Are pregnant, think you are pregnant, or are breastfeeding.

BEFORE A MRI SCAN THE RADIOLOGIST KNOW IF YOU:

- Are worried about being in small, enclosed space (i.e. you are claustrophobic). This is because an MRI scan involves being in a confined space (a long tube). The radiologist can help alleviate any concerns by discussing the process in more detail, showing you the MRI machine and/or giving you medicine that helps you relax before the test.
- Have any iron-based metallic objects in your body as they may be damaged by an MRI scan. These include implanted defibrillators or pacemakers and metal coils put inside blood vessels (known as stents).
- Have any kidney problems; you may also need to have blood tests to check your kidney function. This is because the contrast material may affect your kidneys.

WHAT TO EXPECT DURING THE SCAN

- Ultrasound is a non-invasive and painless test performed using a probe on the skin surface that is controlled by an ultrasonographer:
 - It can be very helpful at defining soft tissues within the body and guiding biopsies.
 - Depending on the numbers of areas to be looked at will, an US generally takes between 10 and 30 minutes.
- A CT scan may start with injecting an iodine contrast into a vein in the arm to help make the images clearer:
 - This may make you feel hot or flushed for a few minutes.
 - You will then lie still on a table that moves slowly through the CT scanner, a doughnut-shaped machine.
 - The scanning only a few minutes, but the preparation takes between 10 and 30 minutes.
- A MRI scan also starts with injecting a dye into a vein in the arm to help make the images clearer:
 - The images are then taken while you lie on a table that slides into a narrow metal cylinder that is open at both ends.
 - The scanning takes about an hour.

- A PET scan also starts with injecting a radiotracer:
 - The radiotracer is left to spread throughout the body and accumulate in the cells that use more energy (including cancer cells) for between 30 and 90 minutes.
 - You will need to lie still during this time.
 - Cells that have accumulated more radiotracer show up as 'hot spots' during the scan, which takes around 30 minutes.

WHAT TO EXPECT AFTER THE IMAGING SCAN

- After the scans are complete, you may be asked to wait while the images are checked to make sure they clearly show the parts of the body that are of interest. If not, more scans may be needed.
- Drink several glasses of water after a PET scan to help flush the radiotracer out of the body.

POSSIBLE SIDE EFFECTS OF IMAGING TESTS

- US require no radiation and is safe, given that it only uses sound waves at the skin surface.
- Although CT and PET scans involve exposure to radiation, the radiation levels are too low to affect the normal processes of the body. However, exposure to radiation should be avoided if you are pregnant or breastfeeding.
- Other possible side effects include anxiety if you are claustrophobic or uncomfortable with needles. It is also possible to have an allergic reaction to the contrast medium or radiotracer.

QUESTIONS TO ASK YOUR DOCTOR

- Why do I need imaging tests?
- Will imaging tests confirm the diagnosis of cancer?
- What exactly will be done during the imaging tests?
- Who will carry out the imaging tests?
- How much will the scans cost? Will my health insurance cover it?
- Are there any possible side effects I need to know about and who do I contact if they happen?
- Can I drive/go to work after the scans?
- Does the scan involve radiation? Is there an alternative test that could be done?

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