

Your Health

Different Types of Scans and What They Can Tell Us©

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Vocabulary & pronunciation study by Catherine Balter Kendall ©

Words are explained alongside the text

Stressed syllables are underlined and in bold*



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If you've ever been **pregnant**, broken a bone or had a bad **concussion** – you've more than **likely** had to have one of four possible scans. These are known as an MRI scan, a **CT scan**, an X-ray or an Ultrasound scan. But what do these scans do? How do they work? What do they show? And how are they different from each other?

Let's start by exploring how an MRI machine works. MRI **stands for** Magnetic Resonance Imaging. An MRI scan uses large **magnets**, radio waves, and a **computer** to create a **detailed** image of a patient's internal organs and structures. Images produced **look like cross-sectional** layers across your body. The scanner itself looks like a large tube with a table in the middle which **allows** the patient to **slide** into the tunnel.

An MRI scanner **contains** two powerful magnets, which are the most **important** part of the **equipment**. The human body is largely made of water **molecules**, which are made out of hydrogen and **oxygen** atoms. At the center of each atom **lies** an even smaller particle called a proton, which **acts as** a magnet and **is sensitive to magnetic** fields.

Normally the water molecules in our bodies are **randomly** arranged, but when you go into an MRI scanner, the first magnet causes the body's water molecules to all align in one **direction**. The second magnetic field is then turned on and off in a series of

pregnant (adj.) expecting a baby

likely (adv.) probably

to stand for (phrasal vb.) to represent, to signify

CT scan (acronym n.) X-ray computed tomography scan

magnet (n.) a piece of iron or other metal, which attracts iron to it

to look like (phrasal vb.) to resemble

cross-sectional (adj.) transversal

to slide (vb.) to move smoothly and easily

to lie (vb.) to exist

to act as (exp.) to have the role of

to be sensitive to (exp.) to react to

randomly (adv.) not in an organized way or pattern

quick pulses, causing each hydrogen atom to move position and then quickly **switch back** to its **original** relaxed state when **switched off**. When the atom **moves back** to the aligned **position**, it releases energy which can be detected by the MRI and a picture can be formed **digitally**. As **scary** as this may **sound**, moving water molecules inside your body is **completely painless** – although make sure you aren't wearing anything metal due to the magnets! An MRI scan differs from CT scans and X-rays because it does not use radiation that can be **potentially harmful** to a patient. An MRI can image organs, soft tissue and internal **structures** like the **spine**. It's particularly good at showing the difference between normal and abnormal tissue.

The X-ray. Perhaps the one scanning technique that most people have heard of, the X-ray **consists** of using a small amount of radiation to **capture** a single image of a specific density. Dense objects like **bone** block the radiation and appear white on X-ray paper. This allows us to clearly visualize bone **fractures** and dislocations. X-rays can sometimes be used to look for specific diseases or tumors too.

Next up: the CT or CAT scan. This stands for Computed Axial Tomography scan. A CT scan works by combining the power of X-rays with computers to create a 360 degree, cross-sectional view of the body, much like an MRI does. A CT scan can image bone, soft tissue and blood vessels at the same time. It can also **evaluate lung** and chest **issues**, detect cancer and **pinpoint** any issues with small boney structures. A **benefit** that the CT has over an MRI is that you can wear metal or have a metal implant and have the scan as a CT doesn't have magnets.

Our last scanning technique is ultrasound. Ultrasound is **particularly** good at showing organs and movement in real time. These scans can show you babies in the **womb**, how far an infection has **spread**, your blood flowing through blood vessels and a lot more. The **benefit** ultrasound has is that there is no radiation or magnets involved – just sound waves. As the sound

to switch back (phrasal vb.) to return to a former position

to switch off (phrasal vb.) to turn off

to move back to (phrasal vb.) to return to a former position

scary (adj.) frightening

to sound (vb.) to seem to be (from what one hears)

painless (adj.) without pain, without causing suffering

harmful (adj.) dangerous

spine (n.) backbone, vertebral column

bone (n.) hard parts in the body which form the skeleton

to look for (phrasal vb.) to search for

next up (exp.) the next subject we are going to discuss here

lung (n.) organs inside the chest used in breathing

issue (n.) problem

to pinpoint (vb.) to identify

benefit (adj.) advantage

womb (n.) uterus

to spread (vb.) to extend to other areas

waves bounce off internal organs, they produce a **pattern** for the sensor to **turn into** an image.

Finally, now that we know how each scan works, how are they different from each other? MRI's are typically used for imaging organs, soft tissue and scanning without radiation. CT's are **typically** used for imaging patients with metal, evaluating lung and chest issues and looking at bone and blood vessels. X-rays are best at looking at bone and **injuries**; it's also very cheap to **perform**. Lastly Ultrasound is the best for 3D visualization in real time.

This week's advice: If you're worried about what's going on inside your body, fear not – the doctor has plenty of scanning methods to choose from!

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pattern (n.) a specific arrangement of lines and shapes

to turn into (phrasal vb.) to transform into

injury (n.) damage done to a person's body

to perform (vb.) to do

Tip

Syllable stress can help us to understand spoken words.

Let's take the words 'install' and 'installation' as an example.

First count the syllables : 'in.stall' has 2 syllables, 'in.stal.la.tion' has 4 syllables.

Syllable stress is when you say one of the syllables slightly louder and with more emphasis. So in this example we say : **install** and **installation**.

The letters "ture" in the following words are pronounced like the first 3 letters of the country **Tchad**:

structure, fracture, capture (also "picture", "furniture", "nature" and "future")