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SCANNING
A SHORT
GUIDE

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Liver NORTH
LIVER PATIENT SUPPORT

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This is an overview of the types of scan you may have on the investigation of your liver disease. Scans are normally done in Radiology Departments, either local or at a specialist hospital for liver disease.

The most common scans are:

1. CT – Computerised Tomography
2. MRI – Magnetic Resonance Imaging
3. Ultrasound
4. FibroScan – Transient Elastography
5. DEXA Scan – Dual Energy X-ray Absorptiometery

Common terms:

Radiographer – a qualified professional who specialises in radiography. Radiographers are regulated by the Health Care Professions Council (HCPC) for example, physiotherapists and paramedics.

Radiologist – a qualified Consultant doctor who has specialised in imaging. They will report on your images and can perform interventions such as a biopsy and angiography, where the doctor will look at your vessels for example to ensure there is no narrowing of an artery, as well as perform ultrasound.

Sonographer – a radiographer who has studied to a higher level than a general radiographer. A sonographer can report on the scans they do, like a Radiologist.

Specialised/Advanced Radiographer – a radiographer who has studied to a higher level than a general radiographer who can report on some images in the area of their specialism, for example: CT, MRI, X-Ray

1. CT Scanning

A CT scanner looks like a doughnut with a bed/table through the middle. If they are scanning your liver it is not thought to be claustrophobic as your head will generally be free. The scanner uses x-rays to take images, which look like thin slices, through your body. These slices build up a picture of the whole area being scanned. Inside the doughnut the x-ray machine spins around your body, this is the slight noise you may hear, sending x-rays to an x-ray receiver, called a detector, opposite. The Radiographer will speak to you though a microphone with breathing instructions; it is really important to listen and do your best to do as they ask. Keeping as still as you can is really important.

Sometimes the scan needs to see the difference between your blood vessels and other tissues. This is done by giving you an injection into a vein in your arm, usually at the elbow, like a blood test but the needle stays in your arm. The injection is a clear fluid called a contrast agent (like a dye) which shows up under x-ray. This sometimes can make you feel a little flushed or warm, a bit like a heated car seat. It is important to tell the radiographer if you have any allergies as the contrast agent can make some patients itch or go very red. Don't worry it is very rare to get a reaction. The radiographer will explain everything when they are getting you positioned on the scanning bed/table.
A CT scan is generally very quick, usually about 10-15 minutes, and then you can leave. If you have had the contrast agent (dye) then you might be asked to wait for 15 minutes in the waiting room so they can check you have no reaction to the contrast agent, at that point they will remove the needle from your arm so you can go home. Once you have left the department, your images are put together and sent to a Radiologist for reporting and then sent to your referring doctor/consultant.

2. MRI

An MRI scan machine looks similar to a CT machine, a doughnut with a hole; only in the MRI scanner the hole is longer more like a tunnel. An MRI uses a very strong magnet and radio-waves to image the tissues in your body and therefore does not use any x-rays. This makes it a safer way to scan. Simply, the scanner magnet will align the atoms in the cells in your body to the magnetic field. The radio-waves will knock the atoms out of alignment and when the radio waves stop the atoms will realign to the magnet giving off a signal which the scanner will pick up and the computer will turn into pictures. Each of the tissues in your body give off different signals and that is how the scanner can build up a detailed image of your body.
When the radiographer positions you on the MRI bed/table they will put a special pad, known as a coil, over your tummy. The coil contains the equipment for the radio-waves to enter your body. This may feel a little heavy but it is not uncomfortable, it is like a

couple of heavy blankets. If other parts of your body are being imaged, the radiographer may use a coil which looks like a little cage over the body part, for example your knee.

Being in the MRI tunnel can make some people a little nervous; try not to worry as you will be able to hear and speak to the radiographer through the microphone and speaker which are in the tunnel. The radiographer will ask you to wear headphones or use ear plugs; don't worry you will still hear the instructions. MRI scans can be very noisy and can sound like someone is loudly tapping/banging on the tunnel; it is all part of the scan.

As an MRI uses a powerful magnet it is very important that you remove all metallic objects before you enter the scan room. To ensure your safety you will have filled in a questionnaire asking whether you have anything metallic in your body, including metallic fragments in your eye from working with metals. The questionnaire will have all the metallic objects of concern outlined so you don't need to worry about forgetting to tell the radiographer.

You may be asked to dress in an outfit which has no metal for example zips, rivets, or an underwired bra; a track suit is probably acceptable. Please follow the instructions to leave other metallic objects at home or in the safe place provided. Your credit/debit card will be wiped by the magnet if you take it in and loose objects can fly into the magnet as it is so powerful. This can cause injury to staff and yourself, plus if they stick to the magnet outer shell the scanner has to be shut down for a considerable time to remove them. This will mean that you and many patients will have their scans cancelled.

An MRI generally takes about 20-30 minutes, however, it can take up to 60 minutes depending on how many areas are being looked at and how detailed the scans are. Once the scan is completed you will be able to go straight home. Often there are many more pictures than a CT scan and these can take longer to report as the Radiologist will want to make sure he has checked all the images in detail.

3. Ultrasound

Ultrasound uses high frequency soundwaves a bit like sonar or radar. Probably the best-known way to use ultrasound is to look at babies in the womb. The soundwaves cannot be heard, they 'bounce' off your organs back to the probe (which looks a little bit like a microphone) on your tummy. From there the computer will change these to images on a monitor on the ultrasound machine.

You may be asked to conform to some dietary requirements so that your organs can be clearly seen. The ultrasound department will let you know what you need to do when you get your appointment. Normally it is to not eat for 4 - 6 hours before the scan; you may be allowed to drink still water depending on the scan. If you are diabetic and worried, the department will be very happy to answer questions.

When scanning your liver the sonographer will put some water based jelly on your tummy. It would be a good idea to wear loose clothing that can be pulled out of the way of your tummy. All your clothes will be pushed aside and large paper towels will be put in place to protect them. The jelly will wash out easily if it does get on your clothes.

The sonographer will then use the probe to look at the organs and tissues in your body, using the jelly to glide over your skin. The sonographer will tell you to hold your breath when necessary and what position to move to as necessary. They will take pictures from the monitor they use to see your organs; often taking measurements of organs surrounding the liver and measuring the blood flow through your liver. Sometimes the sonographer will have to press hard on your tummy, but this will not last long and is not too painful.

Once the scan is finished you can use the paper towel to wipe your tummy and then you go home. The sonographer will give a written report to the doctor/consultant who sent you for the scan.

Using ultrasound to scan you is considered harmless and has been used since the early 1970s without any incidents of harm caused by the ultrasound waves.

4. FibroScan

This is a scan which is usually performed in out-patients by a specialist nurse or doctor, although it can be done through your GP if they have the equipment. It measures the stiffness of your liver (the liver elasticity). If your liver is damaged fibrous tissue forms and makes your liver stiffer than normal.

Like having an ultrasound, it would be a good idea to wear loose clothing that can be pulled out of the way of your tummy. Similar to an ultrasound, a probe will be placed on your tummy just on or below your ribs on the righthand side. The probe will remain stationary and use high powered soundwaves to measure how stiff your liver is. It is painless and about 10 readings may be taken to get an accurate reading. The process takes about 10 minutes, after which you will be free to go. The results will be sent to the doctor who referred you.

5. DEXA

This is a bone density scan used to show how dense (strong) your bones are. Some patients (not all) with advanced cirrhosis may have osteopenia (lower bone density) or osteoporosis (which is where the bones are weakened and may break). The scan uses low dose x-rays to look at the bones in your hip joints and your spine. The radiographer will ask you to lie on the x-ray bed/table and will ask you to put your heels apart with your toes touching to get the best images of your hips. They will position the x-ray machine over your hips and take a picture, then move it to over your spine to take a picture. The images are then measured by the computer to establish the density of the bones. It is painless and you will be able to go straight home after. The results will be sent to the doctor who requested the scan.

Acknowledgement:

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LIVErNORTH can help you.

As well as having many health professionals as members, we have access to extensive information on all liver diseases and treatments - contact info@livernorth.org.uk or call 0191 37002961