Your Pet &

MRI IN CANCER DIAGNOSIS

Registered charity no: 209642

following radiotherapy of brain tumours, most of which stop growing or even shrink following treatment. In this way the owner can be kept informed of their pet's progress and the likely long term outlook; it also helps vets to assess the success of different treatment regimes in their patients. This 'clinical research' is a very important aspect of the Trust's work, as it benefits not only the current patients but also future generations.

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R.C.V.S. and European Specialist in Veterinary Diagnostic Imaging

The Animal *Health* Trust is an internationally recognised centre of excellence in the field of veterinary medicine.

It has pioneered many breakthroughs in relation to improving the prevention, diagnosis and treatment of animal disease and injury and is entirely dedicated to improving the health and welfare of cats, dogs and horses.

As a registered charity we receive no government funding and rely on charitable support in the form of legacies and donations to enable us to continue our valuable work. You can help us in the following ways:

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- **Making a donation**
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Email: fundraising@aht.org.uk
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the science behind animal welfare

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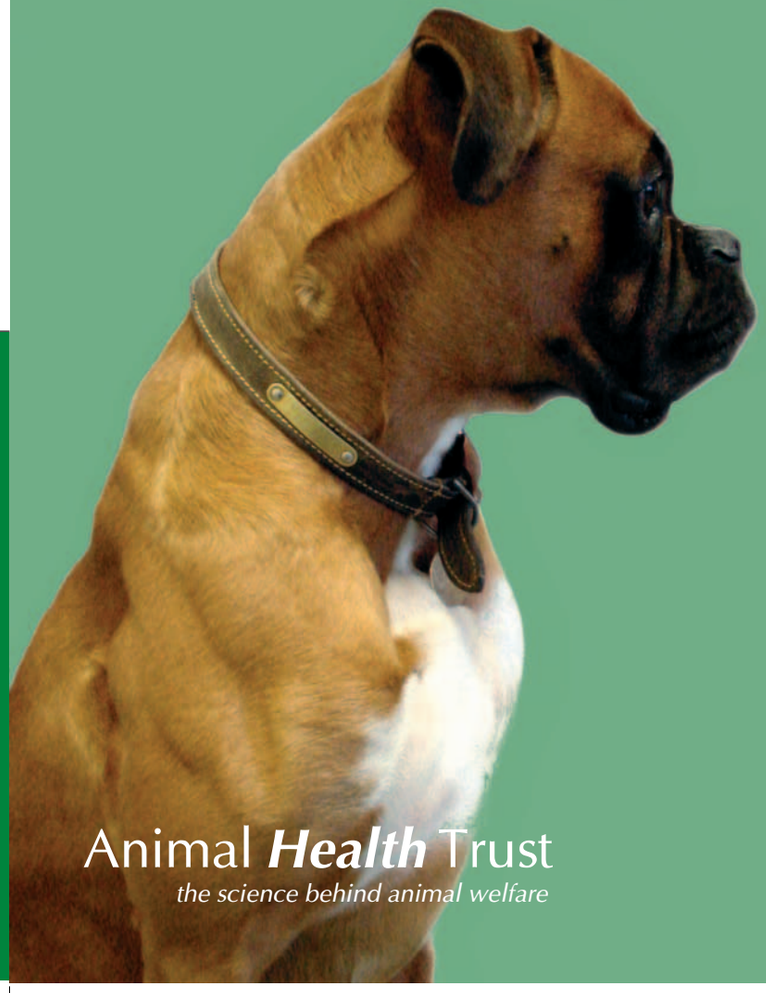

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MRI IN CANCER DIAGNOSIS

MRI, or magnetic resonance imaging, is a type of body scanning used widely in medical diagnosis. The Animal Health Trust has a very powerful MRI scanner and is pioneering its use in veterinary medicine, especially in the diagnosis and management of cancer in dogs and cats.

MRI produces detailed cross-sectional pictures of the body using a complex technique that combines magnetic fields and radio signals. The scanner itself is a powerful magnet, usually tubular in shape. The patient lies in the centre of the magnet's central bore and is then subjected to a series of radio wave pulses lasting for several minutes.

Radio signals are detected and converted to an image using advanced computer techniques. The process is completely painless and quite safe for the patient but the main problem lies in ensuring that the patient remains completely still for the duration of the scan. In veterinary patients this is accomplished using anaesthesia. The resulting images represent thin slices of tissue which are displayed in amazing detail, allowing radiologists to assess internal body structure in a way that has not been possible until now. The images can be produced in any plane which means that 3-dimensional information is given, something that is not possible with conventional X-rays. MRI represents three important benefits for cancer patients: diagnosis, treatment planning and follow-up monitoring.

Diagnosis

In many patients with cancer the diagnosis is suspected on clinical grounds, because an obvious lump is present. In other cases the clinical signs prompt investigation using conventional tools such as radiography and ultrasound, which allow a diagnosis to be made. In some patients, however, the disease may be in parts of the body which are not accessible to conventional imaging, such as brain tumours or tumours lying deep within other tissues. In these cases MRI may be the only way to make a diagnosis. This is particularly true of brain tumours which, until recently, could not be diagnosed and therefore were not treated. Even when a tumour is visible by radiography or ultrasound examination, MRI will usually give more information about its extent.

Treatment planning

The 3–dimensional nature of the MRI images allows increased precision in treatment, increasing its chances of success. If the tumour is to be treated using radiotherapy it is important that as little normal tissue is affected as possible. Using the MRI scans, the exact size, shape and location of the tumour can be seen and the radiotherapy beam applied to the minimum area possible. This process can, in some instances, be computerised which increases its accuracy. Again, brain tumours are an excellent example of the use of MRI in treatment planning. Before the availability of MRI, a brain tumour might be suspected on clinical grounds but, without knowing its exact location in the brain, treatment was not possible. MRI is also helpful in planning surgery by showing the extent of the tumour and involvement of adjacent structures such as major blood vessels. Just as importantly, MRI may show that surgery is not possible, and this will prevent the patient (and its owner) from undergoing a procedure that will not be successful. Thus, MRI allows us to perform ever more advanced surgery with the maximum chance of success and the greatest welfare implications for the patients.

Monitoring success of treatment

Because MRI is not harmful, it can be used repeatedly to monitor the response of a tumour to treatment. This is especially important