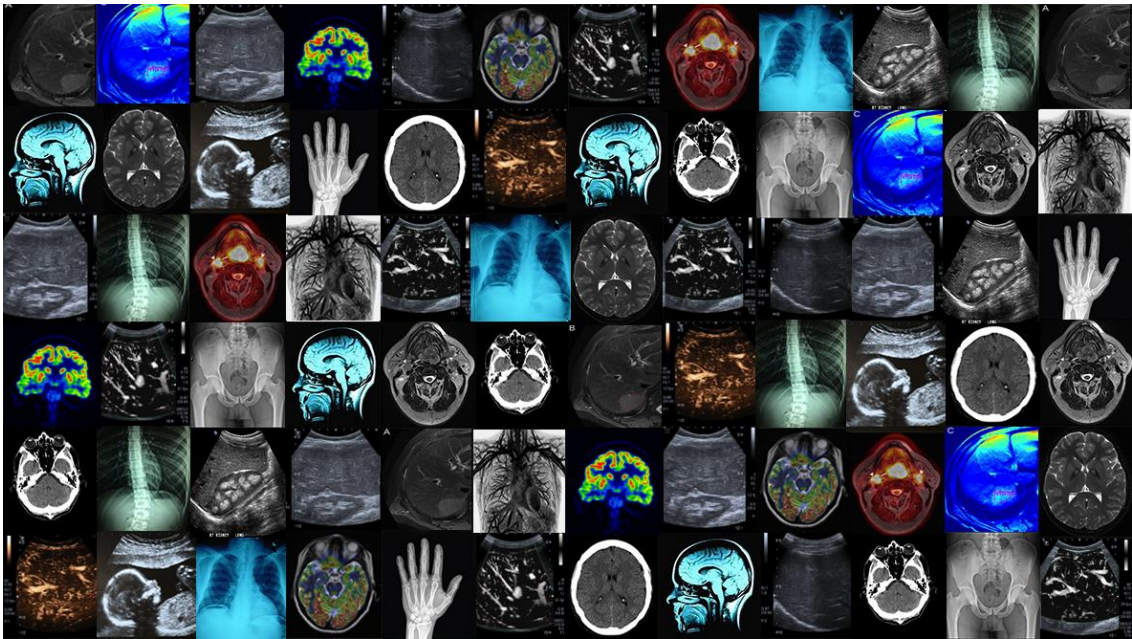


PHYSIO TIPS

IN NOVEMBER

EXPLAINING MEDICAL IMAGING



Physio Tips is a monthly newsletter aimed at educating the public regarding the latest's evidence in injury management, without all the medical jargon. We will keep it simple and concise, but full of knowledge gems in order to empower and equip you.

REACH OUT TO US

Medical imaging is often used as a tool to assist with diagnosing musculoskeletal conditions by identifying abnormalities in the structures that they 'photograph'. Although these imaging methods can be very useful, they are not fool proof and need to be interpreted with caution. This month we will look at the differences between all the main types of imaging, as well as some statistics that challenge our beliefs surrounding the results of these diagnostic tools.



X-ray's

X-rays use radiation to produce an image of the body's internal structure. They are typically used to diagnose and assess bone degeneration or disease, fractures and dislocations, infections or tumors. X-rays are usually used prior to any other imaging, but further imaging will be required if soft tissue structures need to be visualised.

CT-scans

CT scan generates a three-dimensional image of the area being examined, by taking multiple x-rays at various angles. These scans are commonly used to evaluate brain injuries, or to check for stress fractures or other fractures that might not be visible on normal x-rays.



REPORTS

ARE MRIS RELIABLE?

Herzog, R., et al. (2016). "Variability in diagnostic error rates of 10 MRI centers performing lumbar spine MRI examinations on the same patient within a 3-week period." The Spine Journal.

**1 patient... 10 MRIs...
10 different results!**

- 49 different 'findings'
- 16 were unique
- 0 found across all 10!

MRI's

MRI combines a powerful magnet with radio waves (using no radiation) and a computer to create highly detailed images of structures in the body. MRI scans are frequently used to evaluate the integrity of structures surrounding joints - like ligaments, discs, labrums, cartilage. Recent studies have however revealed possible inconsistencies in specialist interpretations of MRI (see image).

Ultrasonography

Ultrasound imaging (sonography) uses high frequency sound waves, to create a live video feed image of the inside of the body. Ultrasound is far less expensive than MRI's and can therefore be very useful to evaluate more superficial ligaments, tendons and muscles.





Is imaging always necessary?

Diagnostic imaging have been invaluable to health care for many years. Imaging has however become over utilized. Very often imaging is not needed. Arguably, for imaging to be regarded as useful, it should improve the management of a certain complaint by providing more information. Large sums of money is spent annually on unnecessary X-rays and scans for conditions such as neck and lower back pain. Only a small number of these tests contribute to better management of the problem.

Incidental findings

So-called “pathological” findings on imaging studies do not always mean that something needs to be “fixed”. Studies have shown that even asymptomatic, fully functional individuals might have “pathological” findings on imagery studies. Some tests may reveal incidental findings that could be unrelated to the presenting complaint. This often leads to unnecessary worry and irrelevant follow-up tests and procedures.



Now let's take a look at what the research tells us about different 'conditions' diagnosed by these tools for each major body area:



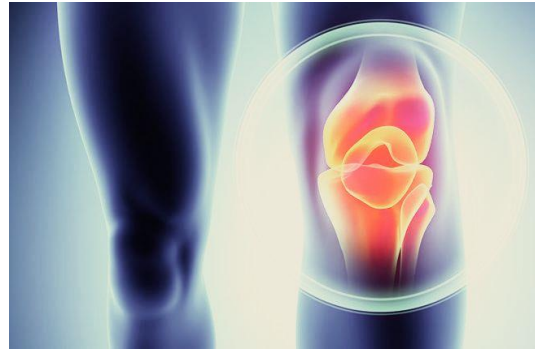
The spine

- * 95% of back pain is categorized as “non-specific low back pain” - this means that the pain cannot be attributed to a specific structure or disease
- * Evidence suggests scans only show something truly important in 5% of people with back pain
- * Approximately 40% people without pain have a bulging disc in their lower back on MRI
- * At age 50, 80% of the pain free population have disc degeneration, and 36% have disc protrusions, in the lower back
- * 75% of people in their 20's without any neck pain, will have a disc bulge in their neck on MRI

Hip and knee pain

* 69% of people between age 15-66 with no hip pain, had signs of labral tears in their hip

* In one study 43 out of 44 people (age 20-68) had at least one meniscal pathology on MRI - these people had no symptoms



Shoulder pain

* One study found that 72% of a group of 53 people without any shoulder pain, presented with labrum injuries when scanned

* A recent study also looked at scanning people with pain in one shoulder. They then scanned the non-painful side and found that there was almost no difference in the amount of abnormal findings between the sides - yes, the non-painful side also had rotator cuff tears!

The take home message: when it comes to the complex experience that we call pain, we cannot conclude that pathology found on images is the only contributor worth considering - many people have pathology without pain! Image results should always be interpreted with consideration of the 'whole person' (which cannot be photographed) as well as the presenting signs and symptoms.

All scans represent just one piece of information that must be interpreted in the greater context of a comprehensive clinical exam.

HUMANS ARE MORE COMPLEX THAN A STATIC IMAGE

Where You Can Find Us



4 Herold Street

021 8829148 or 021 8832516

3A Arun Place, Sir Lowry's Pass Village Road

021 8527711 or 021 8527751

HAVE ANY QUESTIONS?



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