

## Response to latest media on BMJ article

### Metal on Metal

New Zealand orthopaedic surgeons have inserted many thousands of hip implants using one of three materials or a combination of two of the three over the last five years. These are metal, plastic or ceramic with the last two being the most popular. In recent years medical technology companies have developed innovations designed to assist patient recovery time and patient mobility. These have been especially useful for younger patients requiring a hip replacement as they are designed to be less invasive and have a longer life. All implants have a particular lifetime and where a revision is required then part or all of the implant will be replaced. In 2010 concern was raised internationally over a heightened number of implants requiring revision, mostly related to the dePuy ASR metal on metal implant. Metal on metal refers to where two metal surfaces are in contact. Each hip joint is made up of a ball and cup which allows the hip to rotate and the person to be mobile. Hips wear out or become damaged either as a congenital (birth) defect, an accident or intense use as for example with athletes and farmers. A hip replacement operation can be a marvellous event for a patient who previously had severe pain, little mobility and once they have a hip replacement their lives and livelihoods can be greatly enhanced.

The current concerns being raised internationally are related to where two metal surfaces are in contact and from this contact microscopic amounts of metal are rubbed off, called metal debris. The results of metal debris being in the body varies and the orthopaedic scientific community is still researching the effects of this metal debris. One effect of metal debris is that no adverse reaction will occur and the patient enjoys the advantages they get from having a new hip replacement. The second may be that the metal debris, called metal ions, of which the two used in the metal on metal hip implants are cobalt and chromium, may enter the soft tissue around the hip implant and cause swelling perhaps with resultant pain. The patient will usually require another operation to investigate the pain and ensure the swelling is treated and where required a revision to the hip implant. The third possible result from metal debris is that the blood and urine record higher levels of cobalt and chromium than is usual. The normal range of cobalt in the bloodstream is between 0.019 and 0.04 micrograms per litre. This means that if all the cobalt in the blood of a normal person was gathered up it would be smaller than a grain of sand.

The normal person requires some cobalt in the blood as it helps Vitamin C and B12 absorption. Vitamin C is required for lots of things in the body but one important area is it stops scurvy. Vitamin B12 is required to form red blood cells. Cobalt is called a trace element, meaning there is a very small amount required in the body, but without it we can't function properly, red blood cell production would be reduced which means not enough oxygen can get into the blood stream. Too little cobalt can cause anaemia and too much can cause cobalt poisoning. What the scientific community doesn't know as yet is how much is

too much. They know that cobalt poisoning doesn't usually occur unless the levels are over 1 microgram per litre – about 5 grains of sand.

Chromium is the other metal which can enter the blood stream or soft tissue from the rubbing between two parts of the hip implant. This rubbing does not necessarily cause any pain, but it can. Normal chromium levels are about 1 microgram per litre again likened to five grains of sand. Chromium is another trace element responsible for many good things in the body. Chromium helps the body regulate itself, especially insulin and blood sugar levels. Chromium can help the body lose weight by stimulating enzymes that assist the breakdown of glucose for energy.

Too much chromium is not good for the body and again the scientific community is not sure of how much is too much. Similar to cobalt the answer is to err on the side of caution and chromium level over 5 micrograms per litre – 2.5 grains of sand is usually sufficient for further tests to be completed.

This is the reason those patients who have a metal on metal implant should be being contacted by their surgeon or they should ensure they contact the surgeon themselves.

In 2011 the President of NZOA advised all surgeons who had used a de Puy ASR implant to contact their patients' regarding the heightened concerns regarding possible adverse reactions to metal ions entering soft tissue or the blood stream from the implant.

The term for this this reaction is called metal debris which occurs from the two parts of the metal implant rubbing together and causing microscopic metal particles to rub off.

The reason for the dePuy ASR implant's recall was that surgeons noticed a higher than usual level of revisions required.

A revision is where a new operation is undertaken on a previously replaced hip joint. The reason for a revision can be multiple – either pain, the implant is too loose, infection or the intended mobility is not high enough. Data collected from 1999 to 2010 shows 69,964 primary conventional hip replacement operations completed and 2,278 revision's (3.3%) and 1093 resurfacing hip replacement operations and 32 revisions (2.9%). The ASR hip implant was requiring revision at a higher rate than this. Currently in New Zealand the revision rate for ASR's is over 25% as many of the surgeons who completed hip replacements in patients with these implants have been proactively completing revisions as a cautionary approach.

Of note there are other metal implants currently being used by orthopaedic surgeons which have been used for many years. At this stage they are performing well and there have not been any serious issues raised. However if you are concerned then the advice is to contact your surgeon. He/she is the one you have the relationship with and they are best placed to give you the correct advice.

NZOA's advice is if you are having trouble contacting your surgeon please supply your name, and address to us through the website [admin@nzoa.org.nz](mailto:admin@nzoa.org.nz). We will keep this information confidential but will follow up with another surgeon who operates in your region and provide you with his or her name.

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Chief Executive