



## X-RAY VISION

Innovation in the treatment of patients with neurovascular conditions is harnessing platinum's radiopacity – clear visibility in X-rays – allowing doctors greater precision and achieving better outcomes

The chemical, physical and mechanical properties of platinum make it uniquely suited to a wide range of medical applications. For example, its purity is such that it is unlikely to cause allergic reactions in the human body.

Platinum's excellent mechanical strength means it can be made into tiny, complex shapes. It is ductile and can be pulled into thin and delicate wires, as well as being inert, therefore it does not corrode easily.

Doctors also value the fact that platinum is radiopaque. Platinum has the highest atomic number of all medically used materials. This, together with its high density, means it can be seen clearly in X-ray imaging as its high density makes it extremely effective at absorbing X-rays rather than allowing them to pass through it.

Platinum's radiopacity is put to great use when performing delicate, life-saving procedures to treat patients with neurovascular disorders such as strokes or aneurysms.

A stroke is a serious and life-threatening medical emergency that occurs when the blood supply to part of the brain is cut off. Ischaemic strokes result from a blockage in an artery carrying blood to the brain and account for around 85 per cent of all stroke cases.

The blockage can either be caused by a blood clot or a narrowing or 'hardening' of the artery due to the build-up of fatty deposits.

The ability to retrieve clots in stroke patients in a minimally-invasive procedure is one of the biggest

Platinum is used to make medical devices because it is:

**Biocompatible** - not harmful or toxic to living tissue, and unlikely to cause an allergic reaction.

**Conductive** - allows the flow of an electrical current.

**Dense** - composed of closely compacted atoms – the more dense a substance it is, the heavier it feels.

**Ductile** - a material's ability to be stretched before it breaks.

**Inert** - chemically inactive, and therefore stable and unlikely to react with other substances.

**Mechanically resistant** - the extent to which a structure resists motion when subjected to a force.

**Resistant to corrosion** - does not damage or destroy other substances when it comes into contact with them.

**Radiopaque** - easily visible in X-ray imaging.

break-throughs in recent medical history. This is now possible due to innovations by the medical technology industry using platinum-based solutions.

For example, Perflow Medical, a privately-owned manufacturer of neurovascular medical devices, has added braided platinum wire to its clot retriever device.

The addition of platinum provides improved mechanical strength and increases X-ray visibility, giving doctors better monitoring and control capabilities during the retrieval process.

Treatment of aneurysms, which are a bulging or ballooning of a blood vessel wall that is at risk of rupture, is also benefiting from Perflow's platinum wire braiding techniques that improve X-ray visi-

bility. Perflow's dense braid is used as a temporary scaffold to retain platinum coils when treating wide neck aneurysms.

### Demand for platinum in medical devices set to grow

In 2017, some 235,000 oz of platinum was used in medical applications. According to the United Nations, the global population will reach over 8.5 billion by 2030, compared to 7.7 billion today.

This estimate, combined with an ageing population and increasing access to advanced medical care, means that demand for healthcare products and services is likely to rise, with resultant growth in platinum demand from the medical sector.

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