

METALS AND MINERALS: CRITICAL TO OUR NATION'S HEALTH CARE SYSTEM



Hecla Mining Company is a precious metals company. The metals and minerals we mine at our operations are at the very front of the nation's supply chain and are essential to many industries, including health care. Specifically, silver, gold and zinc are critical components of the important medicines and medical devices that healthcare workers and patients rely on every day.

SILVER

The Antimicrobial Benefits of Silver

The use of silver in medicine dates back thousands of years, and scientists have long known that the metal is a potent antibacterial agent. Since silver helps fight infections, it is used as a coating on medical devices such as breathing tubes and catheters, and can be found in bandages and ointments because it helps wounds heal more quickly. It's also being applied to artificial bones and scaffolding used to keep bones in place while they mend and is an ingredient in a number of antibiotics. In addition, silver can heighten the effectiveness of certain drugs. For instance, a small amount of silver makes bacteria like E. coli significantly more sensitive to antibiotics like penicillin. Sources: *The Silver Institute, National Mining Association*

Silver nanoparticles sterilize up to 650 types of bacteria

Silver in X-Rays



Silver is used in the creation of X-rays.

Silver X-rays are integral to health care in developing countries where resources are scarce because they are extremely accurate and cost effective. Source: *National Mining Association*

GOLD

Gold is Vital for Medical Devices



Gold is used in the production of CAT Scan devices.

Gold is essential to sophisticated medical equipment, including life-supporting devices such as pacemakers, heart stents and CAT Scan devices. It is also used in the treatment of heart disease. Source: *National Mining Association*

Gold Nanoparticles are Powerful Medicine

Gold nanoparticles are small gold particles with a diameter of 1 to 100 nm which, once dispersed in water, are known as colloidal gold. For centuries, colloidal gold has been used in art and photography, but now modern science is discovering endlessly beneficial applications in the world of medicine. From pregnancy tests to tumor treatments, gold nanoparticles are an important medical tool with growing applications for the future. Source: *The World Gold Council*

Gold nanoparticles are an important medical tool with growing applications for the future

ZINC

Zinc's Contributions to Medical Technology



Zinc is used in the production of defibrillators.

With their resistance to radiation, durability in harsh environments and malleable properties, zinc alloys are ideal for medical manufacturing applications. The metal's practical usage in medical technology includes defibrillators, portable oxygen supplies and patient monitoring devices. *Source: National Mining Association*

Zinc alloys are ideal for medical manufacturing applications

The Impact of Zinc on the Human Body



Zinc is vital for a healthy immune system.

Zinc is a metal found in every tissue of the body and is often called a "trace element" because very small amounts of zinc are vital for a healthy immune system, correctly synthesizing DNA, promoting healthy growth during childhood, and healing wounds. Only a small intake of zinc is necessary to reap the benefits. The element is naturally found in many different foods, but it is also available as a dietary supplement. A lack of zinc can make a person more susceptible to disease and illness. Zinc is also responsible for a number of functions in the human body and helps stimulate the activity of at least 100 different enzymes. In addition, studies have shown that zinc supplements may also help reduce the duration of symptoms from the common cold. *Source: Medical News Today*