

METAL ALLERGY TESTING: ORTHOPEDIC IMPLANTS



Metal allergy (or hypersensitivity) is an excessive immune response to certain metals.¹⁻¹⁰ These metals are in jewelry, orthopedic, dental , cardiac and other implants. All metal implants degrade over time and release small amounts of metal. Metals are thought to produce an immune response by attaching to natural serum proteins and changing them enough to look foreign to our immune system.

Metal-LTT is a highly quantitative blood test method to measure cellular immune responses (Delayed Type Hypersensitivity) to metals in orthopedic implants.

Metals in Implants

Metals in orthopedic and dental implants include:

Cobalt alloys: Cobalt, Chromium, Molybdenum, Nickel

Titanium alloys: Titanium, Aluminum and Vanadium

Stainless Steel: Iron, Chromium, Molybdenum, Nickel

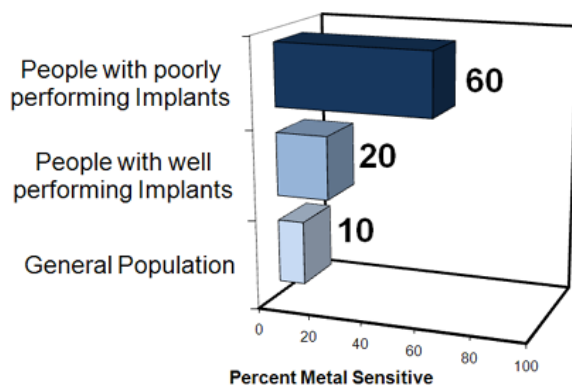
Zirconium alloy: Zirconium, Niobium

Types of Metal Implants

- Total Hip, Knee and Disc Implants
- Plates
- Screws / Surgical Clips
- Total Mandibular Joints
- Spine Rods Connectors
- Total Joint Implants

Metal Hypersensitivity

- Reactions can occur both immediately after surgery and months to years after surgery.
- Metal reactivity has been characterized as Type IV lymphocyte mediated response.¹⁻⁵
- People with failing or painful implants have double the incidence of hypersensitivity as people with well-performing implants.²



Symptoms of Metal Hypersensitivity Include:

- Eczema/Rash/Dermatitis/Hives
- Effusions
- Pain
- Osteolysis
- Implant loosening
- Granulomas
- Chronic inflammation
- Impaired wound healing

The leader in analyzing immunologic reactivity to biomaterials

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Testing patients for metal hypersensitivity before implant surgery can improve patient outcome by choosing the right implant and decreasing the number of adverse reactions due to hypersensitivity responses.^{1-4,6,9,10}

Studies indicate that Lymphocyte Transformation Testing may have several advantage over dermal patch testing for implant related hypersensitivity.^{2,5,9}

1. Dermal contact is different than that in an in-vivo environment.
2. The potential of inducing hypersensitivity by extended dermal contact during patch testing.
3. Uncontrolled/variable testing environment from patient to patient during patch testing 48 hours.
4. Discomfort of the patient during 48 hours patch testing.
5. Lack of standardized dosing/challenge agent for patch testing of implant metals.

Metal-LTT is a Lymphocyte Transformation Test that measures immune cell reactivity (Type-IV Delayed Type Hypersensitivity reactions) to metal antigens. The Metal-LTT test measures the proliferation (activation) responses of white blood cells (lymphocytes) after 5 days of exposure to selected metals.

Available Test Panels :

Orthopedic Panel 1	Orthopedic Panel 2
<ul style="list-style-type: none"> •Aluminum •Cobalt •Chromium •Iron •Molybdenum •Nickel •Vanadium •Zirconium 	<ul style="list-style-type: none"> •Aluminum •Cobalt •Chromium •Iron •Molybdenum •Nickel •Vanadium •Zirconium •Titanium alloy particles •Cobalt alloy particles •Bone Cement particles •Bone Cement liquid

Directions for Testing:

(see details at www.orthopedicanalysis.com)

- Get order from physician for test and blood draw.
- Contact Orthopedic Analysis for blood draw kit.
- Have blood drawn by qualified personnel.
- Send blood kit to Orthopedic Analysis with overnight-shipping.
- Results available in 7-10 days.

REFERENCES

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See www.orthopedicanalysis.com for more research, sample results and extended references

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