MAYO CLINIC LABORATORIES

# Test Definition: ZN_S

Zinc, Serum

## Overview

### Useful For

Detecting zinc deficiency

### Special Instructions

- Metals Analysis Specimen Collection and Transport

### Method Name

Triple-Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS/MS)

### NY State Available

Yes

## Specimen

### Specimen Type

Serum

### Specimen Required

**Patient Preparation:** High concentrations of gadolinium, iodine, and barium are known to potentially interfere with most inductively coupled plasma mass spectrometry-based metal tests. If either gadolinium-, iodine-, and barium containing contrast media has been administered, **a specimen should not be collected for 96 hours.**

**Supplies:**

-Metal Free Specimen Vial (T173)

-Metal Free B-D Tube (No Additive), 6 mL (T184)

**Collection Container/Tube:** 6-mL Plain, royal blue-top Vacutainer plastic trace element blood collection tube

**Submission Container/Tube:** 7-mL Mayo metal-free, screw-capped, polypropylene vial

**Specimen Volume:** 0.8 mL serum

**Collection Instructions:**

1. **This specimen must always be drawn first**.
2. **Do not collect specimen from a line.** Avoid hemolysis.
3. Allow the specimen to clot for 30 minutes; then centrifuge the specimen to separate serum from the cellular fraction.
4. Within 4 hours of specimen collection, remove serum from cellular fraction. Remove the stopper. Carefully pour specimen into a Mayo metal-free, polypropylene vial, avoiding transfer of the cellular components of blood. **Do not** insert a pipet into the serum to accomplish transfer, and **do not** ream the specimen with a wooden stick to assist with serum transfer.
5. See Metals Analysis Specimen Collection and Transport for complete instructions.

### Forms

If not ordering electronically, complete, print, and send General Test Request (T239) with the specimen.

### Specimen Minimum Volume

Serum: 0.2 mL

### Reject Due To

| | |
|---|---|
| Gross hemolysis | Reject |
| Gross lipemia | OK |
| Gross icterus | OK |

### Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---|---|---|---|
| Serum | Refrigerated (preferred) | 28 days | METAL FREE |
| | Ambient | 28 days | METAL FREE |
| | Frozen | 28 days | METAL FREE |

## Clinical & Interpretive

### Clinical Information

Zinc is an essential element; it is a critical cofactor for carbonic anhydrase, alkaline phosphatase, RNA and DNA polymerases, alcohol dehydrogenase, and many other physiologically important proteins. The peptidases, kinases, and phosphorylases are most sensitive to zinc depletion. Zinc is a key element required for active wound healing.

Zinc depletion occurs because it is either not absorbed from the diet (excess copper or iron interfere with absorption) or lost after absorption. Dietary deficiency may be due to absence (parenteral nutrition) or because the zinc in the diet is bound to phytate (fiber) and not available for absorption. Excess copper and iron in the diet (eg, iron supplements) interfere with zinc uptake. Once absorbed, the most common route of loss is via exudates from open wounds or gastrointestinal loss. Zinc depletion occurs in burn patients who lose zinc in the exudates from their burn sites. Hepatic cirrhosis causes excess loss of zinc by enhancing kidney excretion. Other diseases that cause low serum zinc are ulcerative colitis, Crohn disease, regional enteritis, sprue, intestinal bypass, neoplastic disease, and increased catabolism induced by anabolic steroids. The conditions of anorexia and starvation also result in low zinc levels.

Zinc excess is not of major clinical concern. The popular American habit of taking mega-vitamins (containing huge doses of zinc) produces no direct toxicity problems. Much of this zinc passes through the gastrointestinal tract and is excreted in the feces. The excess fraction that is absorbed is excreted in the urine. The only known effect of excessive zinc ingestion relates to the fact that zinc interferes with copper absorption, which can lead to hypocupremia.

### Reference Values

0-10 years: 60-120 mcg/dL
11-17 years: 66-110 mcg/dL
> or =18 years: 60-106 mcg/dL

### Interpretation

Normal serum zinc levels are from 60 to 106 mcg/dL in adults.

Patients who are burnt and have acrodermatitis may have zinc levels as low as 40 mcg/dL; these patients respond quickly to zinc supplementation.

An elevated serum zinc concentration is of minimal clinical interest.

### Cautions

Hemolyzed specimens will cause false elevation of serum zinc levels.

Specimens collected through a vascular line may falsely increase the zinc level. Consider recollection by venipuncture if clinically indicated.

It is essential that the specimen is collected following the trace metals collection procedure, see Metals Analysis Specimen Collection and Transport.

### Clinical Reference

1. Tucker SB, Schroeter AL, Brown PW Jr, McCall JT. Acquired zinc deficiency. Cutaneous manifestations typical of acrodermatitis enteropathica. JAMA. 1976;235(22):2399-2402
2. Skelton JA, Havens PL, Werlin SL. Nutrient deficiencies in tube-fed children. Clin Pediatr. 2006;45(1):37-41
3. Zorbas YG, Kakuris KK, Neofitov IA, Afoninos NI. Zinc utilization in zinc-supplemented and -unsupplemented healthy subjects during and after prolonged hypokinesis. Tr Elem Electro. 2008;25:60-68
4. Ayling RM, Crook M. Nutrition: Laboratory and clinical aspects. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:457-501
5. Hess SY, Peerson JM, King JC, Brown KH. Use of serum zinc concentration as an indicator of population zinc status. Food Nutr Bull. 2007;28(3 Suppl):S403-S429

## Performance

### Method Description

The metal analytes of interest are analyzed by triple-quadrupole inductively coupled plasma mass spectrometry.(Unpublished Mayo method).

### PDF Report

No

### Day(s) Performed

Monday through Saturday

### Report Available

1 to 3 days

### Specimen Retention Time

14 days

### Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

## Fees & Codes

### Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

### Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

### CPT Code Information

84630

### LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|
| ZN_S | Zinc, S | 5763-8 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| 7735 | Zinc, S | 5763-8 |