

## Division of Laboratory Medicine

### Biochemistry

## Zinc, Zn (blood)

### General information

Zinc is the second most abundant metallic trace element in the body (after iron). It has atomic weight of  $65.38 \pm 0.002$  amu. Zinc has multiple biochemical functions including being an essential component of many enzymes. Deficiency results in a variety of clinical features such as acrodermatitis enteropathica, dermatitis, hair loss, growth retardation, poor wound healing, anorexia, impaired sensation of taste or smell and haemolytic anaemia.

Zinc deficiency can be due to inadequate feeding (e.g. TPN), impaired absorption or increased losses (e.g. gastrointestinal fistula). Copper supplementation can also result in zinc deficiency as they compete for absorption.

Serum zinc may be a poor indicator of deficiency when albumin is low.

#### Collection container:

Serum The sample must be collected into a plain plastic bottle, which has been shown to be suitable for trace metals

Adults: 4.9mL Gel-free Serum (Sarstedt white top)

Paediatrics: 1.2mL Serum (Sarstedt white top)

External users: separated serum in a plain plastic bottle, which has been shown to be suitable for trace metals.

#### Type and volume of sample:

Serum/

Serum (gel-free). Minimum 1.0mL whole blood required (150uL separated serum)

#### Specimen Transport/special precautions:

Internal: No special precautions

External: Separate and aliquot into a secondary tube

### Laboratory information

**Method principle:** Inductively Coupled Plasma Mass Spectrometry (ICP-MS).

Measured at the Oxford Road Campus specialist biochemistry.

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#### Biological reference range or cut off:

##### Serum/Plasma

1 month	10 - 22 $\mu\text{mol/L}$
Up to 12 years	10 - 18 $\mu\text{mol/L}$
>12 years	10 - 22 $\mu\text{mol/L}$

**Turnaround times:** 1 week

### Clinical information

#### Factors known to significantly affect the results:

Glass tubes are unsuitable for zinc analysis (zinc is used in various glass manufacturing processes, thereby causing falsely raised zinc levels in samples taken in glass tubes). Any tube with a rubber seal or septum is also likely to cause contamination of the sample.

Samples collected in EDTA tubes will result in spuriously low zinc levels so are not suitable for analysis.

**Clinical decision points:** NICE for Nutritional Support recommends 2-4 weekly monitoring initially. ESPGHAN states should be monitored but no timeframe therefore we would recommend a minimum retesting interval of two weeks.

An acute phase response (indicated by raised CRP) could be the cause of a low zinc level so this should be repeated when resolved.

#### References:

- 1) NICE Clinical Guideline CG32. Nutrition support in adults: oral nutrition support, enteral tube feeding and parenteral nutrition. Issue date: February 2006, updated Aug 2017.
- 2) Taylor A. Detection and monitoring of disorders of essential trace elements. *Ann Clin Biochem* 1996; 33: 486-510
- 3) Taylor A. Measurement of zinc in clinical samples. *Ann Clin Biochem*. 1997; 34: 142-50
- 4) Galloway P, McMillan D, Sattar N. Effect of the inflammatory response on trace element and vitamin status. *Ann Clin Biochem* 2000; 37: 289-297

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