Antioxidant activity  
*(serum total and nutritional antioxidant activity)*  
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**Introduction**

The radical-scavenging antioxidants of human serum represent a heterogeneous group of substances, some synthesised in the body and some derived exclusively from the diet. The concept of serum total antioxidant activity (TAA) was evolved in the 1990’s [1] after it was found that serum antioxidant activity is normally tightly controlled and that there can be serious consequences of prolonged low serum TAA in oxidative stress states [2,3,4]. There is now a considerable amount of published work on the relationship between serum TAA and long-term effects on human health [5,6].

**Total and nutritional antioxidant activity**

Approximately half of the serum TAA can be accounted for by the activities of albumin and uric acid [7,8], synthesized in the liver. Other endogenous compounds (such as bilirubin) may be important under certain circumstances. The remainder of the serum antioxidant activity is contributed by diet-derived compounds (vitamins, polyphenols, phenylpropanoids etc.) and is measured as the nutritional antioxidant activity (NAA).

**Indications:** Oxidative stress states, nutritional deficiencies.

**Patient preparation:** abstain from taking antioxidant supplements (any supplements containing vitamins A, C or E) for 12 hours prior to sampling.

**Specimen requirements:** 5 ml of clotted blood (red / red speckled top tube). The serum should be separated for samples from outside the United Kingdom.

**Interpretation and reference interval**

The reference interval for serum total antioxidant activity by this method is 1.32 – 1.58 mmol/L (Trolox equivalents).

The reference interval for serum nutritional antioxidants is 450 – 800 μmol/L (Trolox equivalents).

Oxidative stress, i.e. the presence of a relative excess of pro-oxidants in the extra-cellular fluid, causes a fall in these figures. However, deficiencies of vitamin C (reference interval 34 – 114 μmol/L) or vitamin E (reference interval 25 – 60 μmol/L) can be predicted to have a marginal effect on serum TAA and hence levels of these vitamins should be assessed individually.

**Methodology**

By decolourisation of the ABTS radical cation, using Trolox as a standard [1].

**Turn around time:** 5 working days.
References


