Cadmium

Description	Cadmium is a silvery-white heavy metal or grey powder. It is toxic by ingestion of salts and inhalation of dust/fumes, with potential carcinogicity. Skin absorption occurs rarely.
Indication	Suspected poisoning or toxicity, usually through chronic industrial exposure during welding, battery manufacturing, galvanising or smelting. Symptoms develop 12-36 hours after exposure and include: nausea, vomiting, diarrhoea, hypersalivation, impaired sensation, breathing difficulties, dyspnoea, coughing, chest pain, and pulmonary oedema. Chronic exposure may cause kidney damage, anaemia, emphysema, bone disease, and prostate/lung cancers. Cadmium poisoning is a notifiable industrial disease and cadmium workers require mandatory occupational monitoring. Environmental cadmium concentration is low.
Additional Info	Cadmium is used in pigments, alloys, electroplating, plastic stabilisers and batteries. It is also being present in tobacco products. Cadmium is largely erythrocyte bound so whole blood measurement is advised. Metallothionein binds cadmium as part of cadmium detoxification, but it is also responsible for cadmium accumulation in the liver and kidneys. Renal tubular damage can occur through reaction of heavy metals with membrane-bound sulphydryl groups, which alters membrane permeability and causes cellular damage. Cadmium is one of the most persistent poisons, with a biological half-life of between 7 and 30 years. For further information, please refer to: HSE HYPERLINK
Concurrent Tests	It is important to assess renal function and urine protein in all suspected cases of cadmium poisoning. Increased urinary excretion of low molecular weight proteins (such as beta-2-microglobulin) provides an early indication of irreversible cadmium-induced tubular dysfunction. Calcium may be low due to impaired vitamin D metabolism in the kidneys. Urine cadmium is not measured since cadmium-induced renal damage may cause low values in exposure.
Dietary Requirements	N/A
Interpretation	• <27 nmol/L (non-smokers) • <54 nmol/L (smokers) • >90 nmol/L(significant exposure) (Source: SAS Trace Element Laboratories Handbook. Third Edition, 1998) For further advice on interpretation and treatment, please refer to the National Poisons Information Service (NPIS).

Collection Conditions	EDTA whole blood (3 mL). Serum or plasma are unsuitable.
Frequency of testing	Monitoring (as required) in subjects with occupational or other sources of exposure.