

Silver

Atomic number 47
Atomic weight 107.87

Collection

Blood 1 mL Plain (non-gel), Heparin, Trace Element tube
Urine 20 mL Sterile Universal

Reference ranges

			Reference
Serum/plasma	nmol/L		
Blood	nmol/L	<0.3	1
Urine	nmol/L		
	nmol/24 h		
	nmol/mmol creatinine		
	µmol/mol creatinine	<LOQ 95th percentile	2

Treatment with silver - Interpretation

Blood ³	Greater than 2800 nmol/L may be found
Urine ³	Greater than 3700 nmol/L may be found

1. Guidance on laboratory techniques in occupational medicine, 12th Edition 2013, Health and Safety Laboratory.
2. Morton J, Leese E, Tan E, Cocker J. Determination of 61 elements in urine samples collected from a non-occupationally exposed UK adult population, Toxicol. Letters 2014; 231: 179-193.
3. Wan AT, Conyers RA, Coombs CJ, Masterton JP. Determination of silver in blood, urine, and tissues of volunteers and burn patients. Clin Chem 1991;37:1683-7.

Clinical

Silver is a non-essential metal that has been used for centuries as an antimicrobial agent and to prevent infections. It is mainly excreted in urine and via the gall bladder into the faeces. It is still used clinically in the form of topical silver sulphadiazine in order to prevent infections in burns patients. There have been very few studies comparing efficacy of this treatment and there is little evidence that it is better than standard dressings or best local practice^{1,2}. There has been a recent increased interest in delivering silver sulphadiazine in the form of nanoparticles^{3,4}.

Silver is usually requested clinically because of potential toxicity, the main feature of which is a blue-grey skin (argyria) and/or eye discolouration (argyrosis) caused by deposition of silver sulphide or silver selenide. If exposure is severe there is some evidence of liver and kidney damage and possible neurotoxicity.

Silver is also available in liquid form (e.g. Nutrasilver) from internet sites. It can also be produced at home by electrolysis using silver electrodes. These preparations are sometimes used as 'treatment' of dubious conditions such as morgellons.

1. Vermeulen H; van Hattem JM; Storm-Versloot MN; Ubbink DT. Topical silver for treating infected wounds. Cochrane Database of Systematic Reviews. (1)CD005486, 2007.
2. Toy LW; Macera L. Evidence-based review of silver dressing use on chronic wounds. J Am Acad Nurse Practit. 2011;23(4):183-92.
3. Hadrup N; Lam HR. Oral toxicity of silver ions, silver nanoparticles and colloidal silver - a review. Regulat Toxicol Pharmacol 2014;68:1-7.
4. Edwards-Jones V. The benefits of silver in hygiene, personal care and healthcare. Letters Appl Microbiol 2009;49:147-52.
5. Wan AT. Conyers RA. Coombs CJ. Masterton JP. Determination of silver in blood, urine, and tissues of volunteers and burn patients. Clin Chem 1991;37:1683-7.