Urinary Copper

Synonyms	
Clinical Indication	The sensitivity and specificity of this test are suboptimal for use as a screening test for Wilson's disease (see caeruloplasmin) but it may be useful to confirm the diagnosis and to evaluate response to chelation therapy. Measuring urinary copper excretion before and after administration of 2 x 500 mg oral doses of penicillamine at 12 hour intervals can help to distinguish children with Wilson disease from those with liver disease due to other causes. Penicillamine greatly increases urinary copper excretion in patients with Wilson disease. It is rarely used because it is unreliable to excluding Wilson disease in asymptomatic siblings, has not been evaluated for differentiating heterozygotes from homozygotes and has not been well standardised in adults. The penicillamine challenge has been standardised in children and as such has been proposed as an adjunctive test.
Part of Profile / See Also	
Request Form	Combined Pathology manual Blood form or ICE request
Availability / Frequency of Analysis	Referred test: Analysed by the Trace Element Laboratory, King's College Hospital if specific criteria met. Synnovis 9067
Turnaround Time	2 weeks
Patient Preparation	None required
Sample Requirements	
Specimen Type	Nitric acid-washed 24hr urine container
Volume	24hr Collection
Container	Nitric acid-washed 24hr urine container. Please contact Clinical Biochemistry to arrange for a container. Nitric acid is used to dissolve the chemical additives/coatings on the inside of the plastic container to reduce contamination. The sample will not be processed if it is not received in a nitric acid washed 24 hour collection container.
Reference Range & Units	Normal adults: less than 0.9 umol/24hr. Wilson's disease: greater than 1.6 umol/24hr.
Interferences	Elevated urinary copper excretion may also be seen in patients with other forms of chronic active liver disease and in heterozygotes for Wilson disease but most often levels are below 1.6 umol/24 hour. Incomplete or over-collection will affect the accuracy of the urine copper excretion result. This test is not suitable for use in patients with renal failure. Alkaline urine can lead to the precipitation of copper hydroxide and may result in falsely low urinary copper concentrations.
Interpretation & Clinical Decision Value (if applicable)	The urinary copper excretion rate is elevated in most patients with symptomatic Wilson's disease.

	Following penicillamine challenge, urinary copper excretion greater than 25 umol/24 hours is much more likely in Wilson disease compared with other types of liver disease.
References	Up to Date – Wilson disease: Diagnostic tests – (Sept 2018)
Test code	24CU
Lab Handling	Record the 24hr volume and record on the form that the correct sample was received (i.e. container had been nitric acid washed). Aliquot into two universal containers and store one in the referrals rack at 4°C and the other in the urine archive rack at 4C. Sent daily by courier to King's College, London. Nitric acid washing protocol: refer to PF-BIO-LP-15 section 10.2

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