Consider the following information when a new analyte (test) is added to the laboratory handbook and at scheduled review.

**Text provided for guidance – please delete after completion*

Field	Detail	Essential?
Test Name (Analyte)	UCu (Urine Copper)	Yes
Alternative Name(s) and Keywords	Copper, Urine,	Yes
Discipline/Specialty	Biochemistry	Yes
Description	Copper is essential for the activity of several important enzymes, including cytochrome oxidase and superoxide dismutase. Copper deficiency is uncommon but may cause anaemia and leukopaenia. It is most likely to be encountered in patients on long-term total parenteral nutrition (TPN) but may also be present in patients with malnutrition or malabsorption. Copper toxicity may occur due to occupational or accidental exposure, copper sulphate is used as a fungicide, algicide and molluscicide. The many symptoms of toxicity include haemolysis, hepatic necrosis, nephrotoxicity and convulsions. It can be treated with chelating agents, such as penicillamine. Wilson's disease is a rare, hereditary defect of copper metabolism. As a result, copper is deposited in the liver, cornea and the basal ganglia rather than being excreted by the normal biliary mechanism. Patients may present in childhood with fulminating hepatitis, haemolysis and renal tubular defects or as young adults with cirrhosis or with manifestations of the disease of the basal ganglia.	Yes
Clinical Indication	Evaluation of urine copper is useful for the diagnosis and monitoring of Wilson’s disease. It is a more sensitive and specific test than serum copper and caeruloplasmin for diagnosis of this condition. Patients with Wilson’s disease demonstrate elevated levels of urinary copper excretion. A penicillamine challenge test increases the sensitivity and specificity by greatly increasing the urinary copper excretion in patients with Wilson’s disease.	Yes
Patient Preparation	There are no requirements as to time, or avoidance of food or drink. Specimens should be collected into clean new vessels and should not be acidified as this will cause leaching of metallic elements, if present, from the container.	Yes

Specimen Container	Samples may be random or 24hr collection. The aliquot volume should be a minimum of 5.0 mL. Although random and timed specimens may both be analysed, timed specimens are more easily interpreted. Specimens are stored in fridge CR4 in the Trace Elements laboratory for at least 2 weeks after reporting and are then destroyed by incineration.	Yes
Container Image		Yes
Primary Sample Type	Urine	Yes
Minimum Volume Required (µL for serum//blood/urine etc. unless otherwise stated)	>300 µL Required for analysis	Yes
Special Precautions / Requirements	None required.	Yes
Transport and Storage Requirements	No special requirements.	Yes
Telepath Test Code	UCU	Yes
National Pathology Code (READ/SNOMED CT)	*To be supplied by LCL I.T. as required**	No
Reference Interval(s)	<u>Copper (urine)</u> The reference range information for urine copper is: Healthy adults: <0.7 µmol/24h <u>Wilson's disease penicillamine challenge</u> Urine pre dose: >1.6 µmol/24 h Post dose: >25 µmol/24 hr Female: 0.020 – 0.076 µmol copper/mmol creatinine Male: 0.016 – 0.047 µmol copper/mmol creatinine	Yes

Telephone Action Limit(s)	None.	Yes
Measurement Units	µmol/L, µmol/24 h, µmol/mmol creatinine	Yes
Clinical Interpretation	Biochemical features of Wilson's disease include low caeruloplasmin levels, low-normal or low serum copper and increased urinary copper excretion. Copper excretion may also be measured after a penicillamine challenge in suspected cases of Wilson's disease. Penicillamine chelates copper and causes an increase in urinary copper excretion in health and a marked increase in Wilson's disease owing to the large hepatic stores. Note that although the total serum concentration of copper is low owing to the reduced levels of caeruloplasmin, the free and albumin-bound concentrations of copper are raised. The diagnostic test is the demonstration of a high copper concentration in a liver biopsy. Copper may also be deposited in the liver in primary biliary cirrhosis and neonatal biliary atresia, but these conditions have other distinguishing features. Acute and chronic liver dysfunction and chronic cholestatic conditions will also cause an increase in urinary copper excretion as the copper is diverted from the dominant biliary excretion pathway. Random urines are of limited use, owing to varying dilution effects during the day. The calculation of the urine copper/creatinine ratio will add interpretative value to these results; although this will also be subject to variation in inter-individual daily creatinine excretion.	Yes
Useful Links / Guidelines	None	Yes
Common Interferences / Causes of Spurious Results	No common interferences.	Yes
Availability of Clinical Advice	Clinical interpretation and advice is available from the duty biochemist on 0151 706 4755, Monday -Friday 8.30 – 8pm, Sat-Sun 9-5pm.	Yes
Significant Change Values	n/a	No
Testing Frequency / Minimum Re-testing Interval	Test is for diagnostic purposes. Re-testing not required unless monitoring trend in excretion during chelation therapy.	Yes
Related tests	Serum copper, serum caeruloplasmin	Yes

Technology & Analytical Principle Used	ICP-MS with collision cell in KED mode.	Yes
EQA Scheme	NEQAS Trace Elements (TEQAS)	Yes
Laboratory Performed	RLH	Yes
UKAS Accreditation Status	Pending.	Yes

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