Cystatin C

General information

Indications for use of Cystatin C assay: The available evidence suggests that measurement of plasma / serum Cystatin C can provide valuable additional information on renal function in specific settings or patient groups.

Patient groups:

1. Patients with very high levels of plasma / serum bilirubin e.g. Hepatic VOD; Hepatorenal syndrome. Cut-offs for Bilirubin > 342 µmol/L paediatrics; 500 µmol/L adults
2. Patients with Low muscle mass e.g.
    a. Duchenne, Becker or other muscular dystrophy, some cerebral palsy patients
    b. Pervasive refusal disorders where weight for height is <75%
    c. Pervasive refusal disorders where plasma creatinine is >75% of ULN
    d. Spina Bifida ± renal insufficiency
4. Patients with Haemoglobinopathies e.g. sickle cell disease, β-thalassaemia
3. Patients where plasma/serum creatinine concentration is discordant with clinical signs and symptoms suggestive of renal insufficiency
6. Patients that may have a creatinine rise due to cation co-transporter 2 interference with some antiretrovirals such as dolutegravir or co-trimoxazole
7. Patients with extremes of muscle mass.

    However, in non-jaundiced patients with normal muscle mass there is evidence that data from the Cystatin C assay does not offer any benefits to patient management over standard plasma / serum creatinine measurement. It is therefore not recommended for general use as a marker of renal function.

Collection container:*

Adults - serum (with gel separator, 4.9mL Sarstedt brown top).

Paediatrics - lithium heparin plasma (1.2mL Sarstedt orange top tube)

Neonates – free-flowing capillary samples are acceptable

*can be added to profile, and in these circumstances does not require a separate specimen

Type and volume of sample

Serum or lithium heparin plasma, minimum 1 mL whole blood required (200 µL separated serum/plasma).

Specimen transport/special precautions

- The Roche Tina-QUANT assay gives results that are comparable with other manufacturers' formulations (Scandinavian Journal of Clinical & Laboratory Investigation, 2010; 70: 347–353)
- Cystatin C is stable in whole blood for up to 72h. There are no published data beyond this delay, so specimens on cells for >72h will be rejected (Clin Biochem. 2013 Oct;46(15):1611-4. doi: 10.1016/j.clinbiochem.2013.06.022. Epub 2013 Jul 2)
- Stability in separated plasma is likely longer than 72h but there are no available data

Laboratory information

Method principle:

Roche Tina-QUANT Gen 2 Immunoassay with calibration traceable to ERM-DA471/IFCC.

Turnaround times:

Results are available within 24 hours (routine). May be available faster, call lab

Clinical information

Factors known to significantly affect the results

Steroids, hypothyroidism, critical illness/sepsis. Effect of malignancy is unknown but influence suspected

Clinical decision points:

Suggested Plasma/Serum Reference Intervals [Sources: Adults - Ann Clin Biochem. 2000 Jan;37 (Pt 1):49-59 and USNKF guidance; Paediatrics - study 1 quoted in Paediatric Reference Intervals (5th Ed). Soldin, Bugnara and Wong. AACC Press 2003; Premature babies Arch Dis Child 2000;82:71–75]

Adults (male and female):

• ≥18 years <50 years	0.56-0.98 mg/L
≥ 50 years	0.61 – 1.40 mg/L

Children (male and female):

• Prematurity (29/40 to 36/40)	0.62 to 4.42 mg/L
• 0 to 28 days	0.80 to 2.30 mg/L
• 1 to 12 months	0.70 to 1.50 mg/L
• 1 to 17 years	0.56 to 1.30 mg/L

Additional Information:

Adults CKD-EPI cystatin equation adjusted for age, sex, and race:

- eGFR = $127.7 \times CysC^{-1.17} \times age^{-0.13}$
- × 0.91 (if female)
- × 1.06 (if Black British)

Paediatrics

- Currently no validated ECGFR equation using cystatin

(Last updated January 2020)