

Cystatin C (in serum)



Kidney

Cystatin C has the highest diagnostic sensitivity for the determination of reduced glomerular filtration

Cystatin C is a low molecular protein, which is continuously developed in all somatic cells. It is filtered by healthy kidneys and tubular reabsorption. For this reason cystatin C serum concentrations depend exclusively on the glomerular filtration rate (GFR) of the kidneys.

As the creatinine value only increases if glomerular filtration rates are reduced by 50 %, Cystatin C is a sensitive marker for subclinical renal dysfunction in this sector. Moderate GFR restrictions can already be detected in the creatinine blind range between 40 and 80 ml/min.

Advantage of Cystatin C

- It is not influenced by
- muscular mass or
- nutrition (protein consumption),
- inflammations (exception: auto-immune and consuming diseases)
- no urine collection required

Indications:

- renal dysfunction screening
- follow-up of acute and chronic renal diseases
- follow-up after kidney transplantation and haemodialysis
- diabetes type II – sensitive detection of nephropathy
- adaptation of the cytostatic dose – cytostatic agents, which are subject to renal elimination
- early detection of pre-eclampsia

Cave :

Methylprednisolone increases the cystatin C level

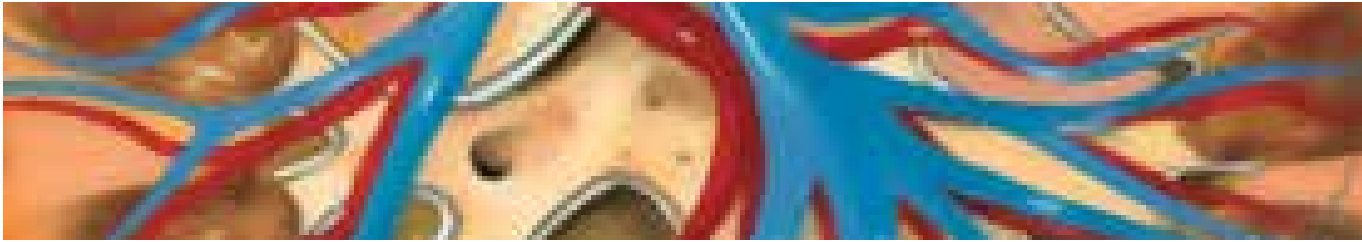
Cyclosporine reduces the cystatin C level

Heavy smoking alters the cystatin C level

Normal range: 0,47 - 1,09 mg/l

After the age of one year the reference values are independent of the patient's age and sex. The GFR is calculated based on the actual cystatin C concentration with Grubb's formula.

$GFR (ml/min \text{ based on a body surface of } 1.732) = (84.69 / \text{cystatin-C}(mg/l) ^{1.69}) * 1.384$. For children under the age of 14 it is multiplied by 1.384.



For the calculation of drug dosages the GFR/ECC is mostly needed in ml/min. Retrograde calculation based on ml/min based on a body surface of 1.732 (ml/min./1.73 m²) the following formula applies:

$$\text{GFR/ECC ml/min.} = (\text{GFR/ECC in ml/min./1.73 m}^2 * \text{body surface})/1.73.$$

The calculation of the body surface is carried out at ZEKCh according to the formula of Duibois&Dubois.

Do you other questions?

Please call us!

We gladly provide additional information.

Literaturverzeichnis

1. Westhuyzen J. Cystatin C: a promising marker and predictor of impaired renal function. *Ann Clin Lab Sci* 2006;36:387-394
2. Nejat M, Pickering JW, Walker RJ, Endre ZH. Rapid detection of acute kidney injury by plasma cystatin C in the intensive care unit. *Nephrol Dial Transplant* 2010;25:3283-3289
3. Myers GL, Miller WG, Coresh J, et al: Recommendations for improving serum creatinine measurement: a report from the Laboratory Working Group of the National Kidney Disease Education Program. *Clin Chem* 2006;52:5-18
4. Blirup-Jensen S, Grubb A, Lindstrom V, et al: Standardization of Cystatin C: development of primary and secondary reference preparations. *Scand J Clin Lab Invest Suppl* 2008;241:67-70
5. Rule AD, Bergstralh EJ, Slezak JM, et al: Glomerular filtration rate estimated by cystatin C among different clinical presentations. *Kidney Int* 2006;69:399-405
6. Flodin M, Jonsson AS, Hansson LO, et al: Evaluation of Gentian cystatin C reagent on Abbott Ci8200 and calculation of glomerular filtration rate expressed in mL/min/1.73 m(2) from the cystatin C values in mg/L. *Scand J Clin Lab Invest* 2007;67:560-567
7. Larsson A, Hansson LO, Flodin M, et al: Calibration of the Siemens Cystatin C Immunoassay Has Changed Over Time. *Clin Chem* 2011;56:777-778
8. Levey AS, Bosch JP, Lewis JB, et al: A more accurate method to estimate glomerular filtration rate from serum creatinine: a new prediction equation. Modification of Diet in Renal Disease Study Group. *Ann Intern Med* 1999;130:461-470
9. Peralta CA, Katz R, Sarnak MJ, et al: Cystatin C identifies chronic kidney disease patients at higher risk for complications. *J Am Soc Nephrol* 2011;22:147-155
10. Rule AD, Larson TS, Bergstralh EJ, Slezak JM, et al: Using serum creatinine to estimate glomerular filtration rate: accuracy in good health and in chronic kidney disease. *Ann Intern Med* 2004;141:929-937

biovis Diagnostik M V Z GmbH

Justus-Staudt-Straße 2
 65555 Limburg
 Tel.: +49/6431/21248-0
 Fax: +49/6431/21248-66
 info@biovis.de
www.biovis.de