Cystatin C Immunoassay

Best GFR marker on routine clinical analyzers

Measure Cystatin C on a routine clinical analyzer

Get GFR results in 10 minutes

Quicker response to changes in GFR than creatinine

Independent of muscle mass, diet, age and gender, unlike creatinine

Avoid creatinine blind area

BÜHLMANN

High Through-put GFR Measurement for Kidney Function

Glomerular filtration rate (GFR)

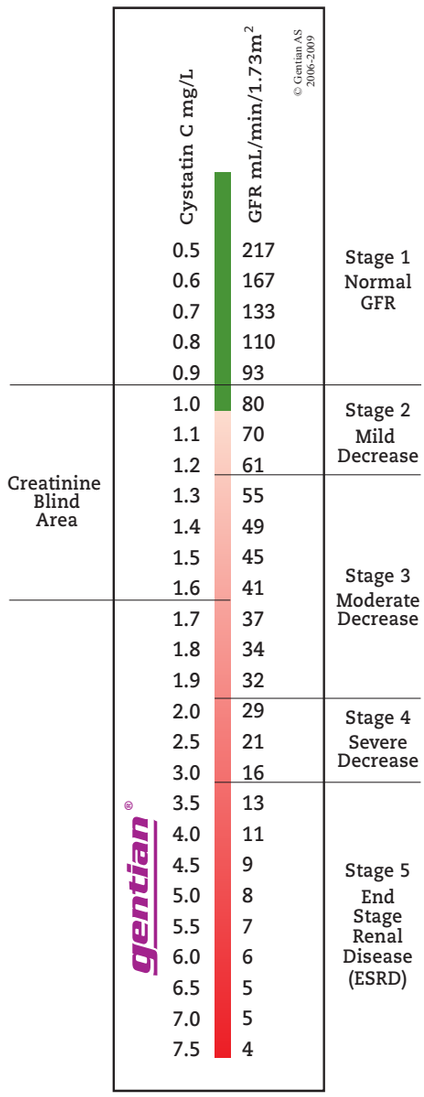
GFR is the most widely used test of renal function and assessment of kidney disease. Estimated glomerular filtration rate (eGFR) is GFR measured using serum creatinine and adjusted for a number of factors including; age, gender, diet, muscle mass and race. **Serum Cystatin C gives a precise measurement of GFR and does not have to be adjusted like serum creatinine.**

Chronic kidney disease (CKD)

CKD is a progressive loss of renal function over a period of months or years. The prevalence of chronic kidney disease has reached epidemic proportions now affecting 15% of the general population. The expense of CKD is staggering claiming an estimated one-third of Medicare and Medicaid budgets. There is a growing body of evidence that indicates that some of the negative outcomes of chronic kidney disease can be averted with early diagnosis and treatment.

Acute renal failure (ARF)

ARF is a serious disease and treated as a medical emergency. It can be the result of trauma or accident. Early detection of kidney damage is vital in ensuring correct patient treatment and shortening patient recovery times.



Cystatin C is a more precise marker than serum creatinine in an emergency situation.

Cystatin C does not suffer from the creatinine "blind area". Cystatin C indicates the state of the kidney now rather than it was 24 hours earlier as is the case with creatinine measurement.

Cystatin C testing is being implemented in the emergency rooms at Karolinska University hospital in Sweden from 2008.

Creatinine blind area

The creatinine "blind area" is the range between 40 and 90 ml/min/1.73 m^2. As the picture on the left shows, this is the area where a decrease in GFR starts to occur. The creatinine "blind area" is very important, because early reduction of GFR will not show with creatinine testing, while cystatin C will show a true positive reduction of GFR.

The creatinine test will give a "false negative", i.e. this patient does not have reduced GFR. [1,2]

The Cystatin C test will give a "true positive", i.e. this patient does have reduced GFR. **Cystatin C GFR gives a direct and accurate measurement of GFR independent of age and muscle mass.**

Cystatin C does not have a "blind area".

Cystatin C is the marker of choice for GFR testing. The BÜHLMANN Cystatin C assay offers accurate measurement for kidney function from one blood sample on routine clinical analyzers.

Cystatin C Measurement for Various Clinical Situations

Chronic and acute renal failure assessed by Cystatin C is indicative of the following clinical problems:

Diabetes

Diabetes is a lifestyle disease, the main cause of which is obesity. The occurrence of diabetes has reached epidemic proportions and threatens to overwhelm national health services. Currently without a cure, management of the disease requires early detection and corrective action.

Clinical studies [3, 4] have demonstrated that Cystatin C is superior to serum creatinine in early detection of reduced renal filtration rate in diabetes. **Only Cystatin C is associated with microalbuminuria** (an important prognostic marker for kidney disease in diabetes), a finding that supports the enhanced sensitivity of Cystatin C based formulas for the early detection of kidney damage.

Cardiovascular disease

Heart failure is one of the leading causes of death worldwide. Acute heart failure has mortality rates as high as 25-30% within one year.

Cystatin C is a prognostic marker for mortality in patients with coronary heart disease. Subjects with raised levels of Cystatin C have a higher risk of death from all causes, but especially a significantly elevated risk of death from cardiovascular causes, myocardial infarction and stroke.

Cystatin C, a serum measure of renal function, is a stronger predictor of the risk of death and cardiovascular events in elderly persons than is creatinine. In this setting, **Cystatin C seems to identify a "preclinical" state of kidney dysfunction that is not detected with serum creatinine or estimated GFR**. [5]

Geriatrics and Chronic kidney disease

Renal function reduces progressively throughout life. Aged persons frequently suffer from reduced kidney function or chronic kidney disease, which may also be accompanied by other diseases such as diabetes or cardiovascular problems. Measuring renal function in aged persons is complicated by reduced muscle mass and age, which are just two of the factors that influence measurement of GFR by creatinine. **Measurement of Cystatin C GFR gives a more precise measurement of GFR in this special patient group.**

Contrast reagents

Contrast-induced nephropathy (CIN) is one of the most common forms of acute kidney injury, and the third most frequent cause of hospital acquired renal failure. Kimmel et al [6] **recommend assessment of kidney function by Cystatin C in CIN intervention trials, because relying on creatinine can be misleading**.

BÜHLMANN Cystatin C Immunoassay

Quality of BÜHLMANN Cystatin C Immunoassay

BÜHLMANN uses avian antibodies exclusive to our Cystatin C Assay. This reduces false positive reactions that may occur with anti-mammalian IgG antibodies and the mammalian antibodies.

BÜHLMANN uses exclusively human Cystatin C for Calibration.

BÜHLMANN provides a stronger standard calibration curve than any other turbidimetric Cystatin C product.

The BÜHLMANN Cystatin C test is highly consistent across batches, analysers and laboratories.

BÜHLMANN provides Cystatin C protocols for most routine clinical analysers:

	Analyzer
Roche Hitachi 911	✓
Roche Hitachi 917	✓
Roche Modular P	✓
Roche Cobas c501	✓
Siemens Advia 1650	✓
Siemens Advia 1200/1800/2400	✓
Olympus AU	✓
Ortho Vitros 5.1	✓
Abbott Architect	✓
Horiba Pentra 200/ 400	✓

References

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3. Piwowar A et al. Plasma cystatin C concentration in non-insulin-dependent diabetes mellitus: relation with nephropathy. Arch Immunol Ther Exp (Warsz). 1999;47(5):327-31.
4. Harmoinen A et al. Evaluation of plasma cystatin C as a marker for glomerular filtration rate in patients with type 2 diabetes. Clin Nephrol 1 999;52:363-70.
5. Lassus, J et al. Prognostic value of cystatin C in acute heart failure in relation to other markers of renal function and NT-proBNP. European Heart Journal 2007) 28, 1841–1847
6. Kimmel, M et al. Improved estimation of glomerular filtration rate by serum cystatin C in preventing contrast induced nephropathy by N-acetylcysteine or zinc preliminary results. Nephrol Dial Transplant (2008) 23: 1241-45

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Ordering code:
KK-CYC
KK-CYC-6 for Ortho and Olympus analyzer

Cystatin C kits (KK-CYC, KK-CYC-6) are IVD products.

Canada: Cystatin C kits are available for Research Use Only. Not for use in diagnostic procedures.
Ordering codes:
KK-CYC-U
KK-CYC-6-U