## Cystatin C

- A protein that can also be used to estimate kidney function, particularly when creatinine levels may not provide a clear picture.

Cystatin C is a low-molecular-weight protein that acts as a protease inhibitor and is produced by all nucleated cells throughout the body. It is synthesized at a consistent rate and is freely filtered by the kidneys. The serum concentration of cystatin C exhibits an inverse relationship with the glomerular filtration rate (GFR); thus, elevated levels correspond to reduced GFR, while lower levels indicate an increased GFR, akin to the behavior of creatinine. However, the renal processing of cystatin C is distinct from that of creatinine. Although both substances are freely filtered by the glomeruli, cystatin C is subsequently reabsorbed and metabolized by the proximal renal tubules, which prevents it from significantly appearing in the final urine output under normal circumstances. Cystatin C can be measured in both serum and urine. Its advantages over creatinine include insensitivity to factors such as age, muscle mass, and diet, with numerous studies suggesting that it serves as a more accurate marker of GFR, particularly in the early stages of renal impairment when creatinine levels remain within the normal range. Additionally, cystatin C has been integrated into estimated GFR (eGFR) equations, including the combined creatinine-cystatin KDIGO CKD-EPI equation. The concentration of cystatin C may be influenced by conditions such as cancer, thyroid disorders, and smoking, with evidence indicating that thyroid hormones may enhance its production.[1]

### References

1. Tapper M, McGrowder DA, Dilworth L, Soyibo A. Cystatin C, Vitamin D and Thyroid Function Test Profile in Chronic Kidney Disease Patients. Diseases. 2021 Jan 03;9(1).