



Tests to assess kidney function

Kidney function tests are part of the Comprehensive Metabolic Panel (CMP)—a key test in the diagnosis and monitoring of multiple myeloma and a part of a routine physical exam. The International Myeloma Working Group (IMWG) and National Comprehensive Cancer Network (NCCN) (<https://www.nccn.org/patients/guidelines/content/PDF/myeloma-patient.pdf>) both recommend kidney function tests for multiple myeloma patients.

The IMWG Recommendations for the Diagnosis and Management of Myeloma-Related Renal Impairment ([/imwg/Recommendations-Diagnosis-Management-Myeloma-Related-Renal-Impairment](#)) state that all patients with myeloma at diagnosis and at disease assessment should have the following tests:



- serum creatinine
- estimated glomerular filtration rate (eGFR)
- electrolyte measurements
- free light chain assessment
- urine electrophoresis (UPEP) of a sample from a 24-hour urine collection

The kidneys of a myeloma patient may be damaged by:

- light chain monoclonal proteins
- high blood calcium levels that result from the breakdown of bones

Learn about each of these tests and how they are used to diagnose and monitor your disease and kidney function:

Blood urea nitrogen (BUN)

REFERENCE RANGE

7–20 mg/dL

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WITHDRAW CONSENT

0.6–1.3 mg/dL

This test is used to assess the “**R**” in the **CRAB** criteria – **R**enal (kidney) function. Creatinine is a waste product from the normal breakdown of muscle tissue. It is filtered through the kidneys and excreted in urine. Measurement of the serum creatinine level is a useful indicator of how well your kidneys are functioning. Kidney function can be seriously affected by light chain proteins. That’s why it’s very important to assess kidney function at diagnosis and at regular intervals thereafter. Even more so, if you have light chain Bence-Jones protein in your urine. Kidney function can also be affected by high levels of calcium in the blood. This can result from myeloma-induced bone breakdown.

Creatinine Clearance Testing

REFERENCE RANGE (mL/min = milliliters per minute)

For males 97–137 mL/min



For females 88–128 mL/min

Creatinine clearance is the amount of blood per minute that the kidneys can make creatinine-free. The measurement of creatinine clearance helps provide information about kidney function. It requires both 24-hour urine collection and a blood sample. Creatinine clearance (and therefore, kidney function) declines naturally with age, explaining the wide range of normal values. The majority of myeloma patients are over 60. These patients may have a seemingly normal serum creatinine level but have a low rate of creatinine clearance. The 24-hour urine sample provides a more accurate assessment of decline in kidney function than does the serum creatinine test.

Creatinine clearance of less than 40 mL per minute is considered a sign of early active myeloma in a patient who otherwise has no CRAB features. These patients should be treated rather than merely observed for disease progression.

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to screen for and detect kidney damage. It is estimated rather than actual because it is calculated from the serum rather than from a 24-hour urine sample. It is usually calculated automatically at the time the creatinine is measured. This test is not accurate for people who are older than 70, very overweight, very muscular, or pregnant.

Electrolytes

Electrolytes are substances that conduct electricity in the body. Examples of electrolytes include sodium, potassium, chloride, and bicarbonate. Electrolytes do the following:

- regulate nerve function
- regulate muscle function
- hydrate the body
- balance blood acidity and pressure
- rebuild damaged tissue



Your healthcare professional will evaluate your electrolyte levels to see if they are off. Electrolyte imbalances may cause kidney disease.

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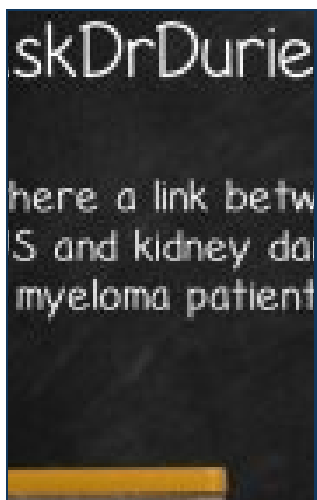
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Last Medical Content Review: March
11, 2025



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