

Hyperkalemia: Elevated Blood Potassium (K⁺)

What is Hyperkalemia?

- Hyperkalemia is a medical condition that refers to having too much potassium in the blood.¹ Potassium, sometimes referred to as K⁺, is an important nutrient that is critical to the function of nerve and muscle cells, including the heart.¹
- For most people, normal blood potassium levels are between 3.5 to 5.0 milliequivalents per liter (mEq/L).² Studies have shown that CKD patients with blood potassium levels >5.5 mEq/L have a higher risk of dying within 24 hours of the event.³
- If not treated, people with severe hyperkalemia can be at risk for abnormal heart rhythms and sudden death.⁴
- Because hyperkalemia can be a recurrent condition in patients with ongoing risk factors, daily management may be required.

Hyperkalemia Incidence:

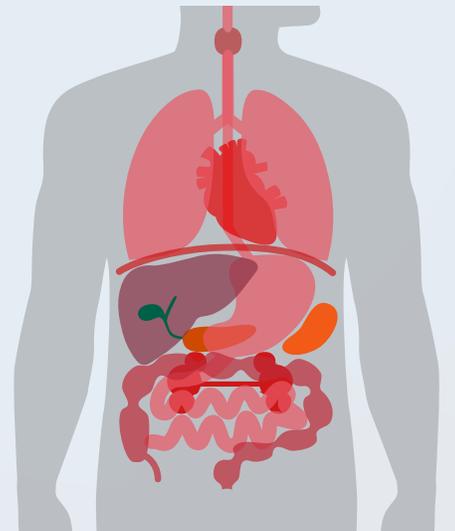
3MM Hyperkalemia patients in the US⁵



About half of all patients with hyperkalemia have either CKD and/or heart failure.⁵

What Causes Hyperkalemia?

- Potassium is an electrolyte that is important for normal functioning of the heart. About 98 percent of potassium in the body is found inside cells,⁷ with the remainder in the blood.
- In healthy people, normal blood potassium levels are maintained when potassium intake via the diet is balanced with uptake of potassium by the cells and excretion by the kidneys.⁷ When the kidneys are not functioning properly, the body can't effectively remove potassium from the body, causing blood potassium levels to be out of balance.⁷
- Hyperkalemia occurs when there is a defect in one or more of the mechanisms that maintain this balance,⁷ most commonly because excretion of potassium by the kidneys is decreased.⁷ This can be due to acute kidney failure or decreasing kidney function such as in chronic kidney disease (CKD), advancing age, certain medical conditions, or medications commonly used in people with cardiovascular and kidney disease.⁷



Who is at Risk?

- People at highest risk for hyperkalemia include those with CKD and/or heart failure.⁸
- People with CKD also frequently have other disorders such as diabetes and high blood pressure that put them at increased risk.⁹
- In the United States, approximately 3 million people with CKD and/or heart failure have hyperkalemia.⁶ As the number of people with these diseases is expected to continue to climb, more people are expected to experience hyperkalemia.³
- Some medicines that are frequently prescribed can cause hyperkalemia as a side effect, such as nonsteroidal anti-inflammatory drugs (NSAIDs) and beta-blockers.¹⁰



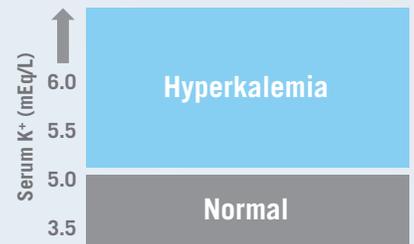
One class of medicines that can cause hyperkalemia as a side effect is renin angiotensin aldosterone system (RAAS) inhibitors, often prescribed to people with CKD and heart failure to help delay disease progression.¹⁰



Commonly prescribed RAAS inhibitor medicines include: angiotensin receptor blockers (ARBs), mineralocorticoid receptor antagonists (MRAs) and angiotensin-converting enzyme (ACE) inhibitors.¹¹

How is it Diagnosed?

- A blood test can determine the level of potassium in the blood.
- The normal range for blood potassium is 3.5 mEq/L to 5.0 mEq/L;² hyperkalemia is considered to be a blood potassium level >5.0 mEq/L.
- Studies have shown that blood potassium levels >5.5 mEq/L are associated with increased mortality.¹²



What are the Signs & Symptoms?

- There are often no warning signs, meaning a person can unknowingly have elevated levels of potassium.¹³ When symptoms do occur, people with hyperkalemia also may experience:



Muscle paralysis⁴



Heart palpitations¹³



Nausea or vomiting¹



Shortness of breath¹



Chest pain¹



Paresthesias¹⁴
(tingling sensation of the skin)

- One analysis of approximately 250,000 patients with hyperkalemia found that nearly 50 percent had two or more episodes in a year, and some (n=70) had more than 20 episodes.³

How is it Treated?

The choice of treatment is determined by the patient's physician and based on clinical assessments including kidney and heart function, how rapidly the disorder developed and the severity of disease.²

- **Low potassium diet:** People with hyperkalemia should talk to their doctor about following a low-potassium diet and/or possible changes to medications that may be necessary.
- **Water pills:** Also known as diuretics, which work by making the kidneys produce more urine to help rid the body of excess potassium.
- **Potassium binders:** Medications that when swallowed, bind to the extra potassium in the bowels to remove it.

Challenges of Long-Term Management

As their kidney function deteriorates, people with CKD may experience a recurrence of hyperkalemia. There are often no warning signs, meaning a person at risk can unknowingly experience increases in potassium recurrently.³ Managing this has long been a challenge for doctors.



Dietary restriction of potassium is an important component of managing hyperkalemia. This is difficult because a low potassium diet is often contrary to the heart healthy DASH (Dietary Approaches to Stop Hypertension) diet that is high in potassium.¹⁵ Furthermore, potassium is found in many popular and healthy foods, including bananas, oranges, potatoes, milk, artichokes, avocados, cantaloupes, raisins, squashes, tomatoes, steaks and hamburgers.

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