

EFFECTIVE 11/5/24: Changes to Laboratory Critical Values for Pediatric Creatinine & Outpatient Glucose

A laboratory critical value is defined as a test result that represents a pathophysiological state at such variance with normal (expected values) as to be life-threatening unless something is done promptly and for which some corrective action could be taken. Each month Bronson’s laboratories make over 2,200 phone calls to notify caregivers of critical values.

There are no “universal” ranges for critical values. Our laboratory accreditation agency (College of American Pathologists) provides this guidance *“The laboratory director, in consultation with the clinicians served, must define the critical values and critical results that pertain to its patient population. The laboratory may establish different critical results for specific patient subpopulations. Allowing clinicians to “opt out” of receiving critical results is strongly discouraged.”*

In recent months, the laboratory was asked to make changes in critical values for two tests: creatinine and glucose. The changes noted below were approved by the Critical Care Committee, the Pediatric Council, Pediatric PI committee and the Clinical Informatics & Integration/Primary Care PI committee.

Pediatric Creatinine

What is changing? Adoption of age-specific critical ranges for pediatric patients. No changes are being made for adult patients.

Old Range	New Ranges
All ages: ≥ 7.50 mg/dl	< 2 years: ≥ 2.00 mg/dl
	2 – 11 years: ≥ 2.50 mg/dl
	12 – 16 years: ≥ 3.00 mg/dl
	≥ 17 years: ≥ 7.50 mg/dl

Where will you see this change?

- All Main Laboratory Creatinine Values
- Point of Care epic Creatinine testing in Surgery, Cath Lab, PICU and Transport (NICU, PICU)

In addition, for laboratory performed testing (i.e., non-Point of Care), we will begin reporting a new value AKI Alert (Acute Kidney Injury) in the pediatric (≤ 16 -year-old) age group only. The AKI Alert is a calculation in Epic that evaluates an increase in creatinine from previous values and/or how far from the normal range the current creatinine is.

There are three levels of alerts. The Level 3 alert will be a critical value:

Level 1: serum creatinine of 1.5–1.9 times baseline or >0.30 mg/dl increase in 48 hours.

Level 2: serum creatinine of 2.0-2.9 times baseline.

Level 3: serum creatinine of 3.0 times baseline or increase to > 4.00 mg/dl (and for age < 18 years, 3x upper limit of age-specific reference range)

Why is this changing? The values from two recent cases are illustrative.

- **Pediatric Critical Values:** A 14-year-old outpatient had a creatinine of 3.98 mg/dl. Because the critical limit was ≥ 7.50 mg/dl, no results were called. The previous result on this patient was

0.86 mg/dl. Fortunately, a parent saw the abnormal values in MyChart and contacted their physician. With the new pediatric critical values, this result would have been called immediately.

- **AKI Alert:** A 4-month-old went from a creatinine of 0.48 mg/d to 1.90 mg/dl within 24 hours. The 1.90 mg/dl did not qualify as a critical value with the old range (≥ 7.50 mg/dl), nor would it qualify with the new age specific range (≥ 2.0 mg/dl). However, it would generate a Level 3 AKI alert and be called immediately.

Outpatient Glucose

What is changing? The lower end of the critical range for outpatients is changing from ≤ 55 to ≤ 40 mg/dl. No changes are being made for inpatient or emergency ranges.

Where will you see this change?

- Main Laboratory Outpatient Testing
- Point of Care testing in Ambulatory and Urgent Care settings.

Why is this changing?

- Prior to 2019, the low end of the critical glucose range was ≤ 40 mg/dl. In 2019 it was changed to ≤ 55 mg/dl at the request of inpatient nursing to help with compliance to a glucose stabilizer protocol. This change caused additional, often unwanted after hours calls to providers on glucose values from samples collected several hours earlier.
- In 2022, the laboratory implemented the Epic Beaker information system, which allows for different inpatient vs. outpatient critical ranges. This makes it possible to return to the previous outpatient critical range and reduce unwanted calls.