LabWire
Laboratory News and Analysis for Clinicians December 2021

Help Us Conserve Our Low Supply of Blood Collection Tubes

Bronson is experiencing shortages of several different types of blood collection tubes due to supply chain challenges. Bronson's inventory of **PST (mint top)** and **SST (gold top)** tubes remains critically low system-wide. We are asking providers to be as conservative as can be safely done when ordering blood testing.

Ways You Can Help Conserve:

1. Discontinue collecting extra tubes without an order.
2. Discontinue "routine" lab orders in both inpatient and outpatient settings. In inpatient setting, if possible, avoid ordering daily labs if the patient is stable AND consolidate orders into one morning draw.

Outpatient Lab Holiday Hours

Due to staffing and supply concerns, we will be opening only a limited number of outpatient labs on Friday, December 24 and Friday, December 31.

The following outpatient lab locations WILL BE OPEN on Friday, December 24 and Friday, December 31

- Bronson Battle Creek Outpatient Testing, Battle Creek – Open 6:30 a.m. to 3 p.m.
- Bronson Advanced Radiology Services, Kalamazoo – Open 6:30 a.m. to 3 p.m.
- Bronson Methodist Hospital Outpatient Testing – South Campus, Kalamazoo – Open 7 a.m. to 3 p.m.
- Bronson LakeView Hospital Outpatient Testing, Paw Paw – Open 7 a.m. to 3 p.m.
- Bronson South Haven Hospital, South Haven – Open 6:30 a.m. to 1 p.m.

The following outpatient lab locations WILL BE CLOSED on Friday, December 24 and Friday, December 31

- Brookside, Battle Creek
- Grace Health, Battle Creek
- Oakridge, Battle Creek
- Family Health Center – Alcott, Kalamazoo
- Family Health Center – Patterson, Kalamazoo
- Bronson Methodist Hospital Outpatient Testing – North Campus, Kalamazoo
- Gull Road, Kalamazoo
- West Main, Kalamazoo
- Stadium Drive, Oshtemo*
- Centre Street, Portage
- Woodbridge, Portage*
- Marshall
- Bronson LakeView Outpatient Testing, Paw Paw*
- Three Rivers
- Vicksburg

All outpatient lab locations **WILL BE CLOSED** on Saturday, December 25 and Saturday, January 1.

***Neither lab nor imaging services** will available at these locations on December 24 and December 31: Stadium Drive - Oshtemo, Woodbridge - Portage and LakeView Outpatient Testing - Paw Paw.

In addition, the COVID-19 curbside testing sites in Battle Creek and Paw Paw will be closed on December 24 and 31. The Kalamazoo curbside testing site will be open on both days. All curbside testing sites will be closed on December 25 and January 1.

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New Formula for Calculating eGFR

Bronson Laboratory will implement a new formula for calculating estimated glomerular filtration rate (eGFR) on 1/5/22. The new formula has been endorsed by the National Kidney Foundation (NKF) and the American Society of Nephrology (ASN) following the work of their joint task force to reassess the inclusion of race in diagnosing kidney disease. The new formula has been adjusted to be inclusive for all populations. It no longer includes race-based coefficients.

The new equation, expressed below, may report a different eGFR and could alter the classification of the kidney disease stage for some people.

CKD-EPI Creatinine Equation (2021), expressed as a single equation:

$$eGFR = 142 \times \min(S_{cr}/K, 1)^{\alpha} \times \max(S_{cr}/K, 1)^{-1.200} \times 0.9938^{Age} \times 1.012 \text{ [if female]}$$

Abbreviations / Units

eGFR (estimated glomerular filtration rate) = mL/min/ 1.73 m^2
S_{cr} (serum creatinine) = mg/dL
K = 0.7 (females) or 0.9 (males)
α = -0.241 (females) or -0.302 (males)
min = indicates the minimum of S_{cr}/K or 1
max = indicates the maximum of S_{cr}/K or 1
age = years

References:

A Unifying Approach for GFR Estimation: Recommendations of the NKF-ASN Task Force on Reassessing the Inclusion of Race in Diagnosing Kidney Disease - American Journal of Kidney Diseases (ajkd.org)

Change in Reporting for Urine Albumin/Creatinine Ratio

Summary

Effective 1/5/22, the reporting units for the Urine Albumin/Creatinine ratio will change from *mg/mg* to *mg/g*. This change is being made to standardize our reporting with guidelines from national organizations.[1,2,3] We will also implement recommendations to no longer use the term microalbumin and will no longer report the Albumin Excretion Ratio.

New Units and Ranges	Previous Units and Ranges
<30 mg/g - Normal	<0.03 mg/mg – Normoalbuminuria
30-300 mg/g - Moderately increased	0.03-0.31 mg/mg – Microalbuminuria
>300 mg/g - Severely increased	>0.31 mg/mg – Overt nephropathy

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Change in Reporting for Urine Albumin/Creatinine Ratio - *Continued from previous page*

Additional Background

For a random urine sample (first am void is optimal), the urine/albumin creatinine ratio is the preferred test[1,2,3] for proteinuria screening. For urine testing, the terms protein and albumin are often used interchangeably. This may lead to confusion on selection of the optimal or desired test. The three methods of "protein" testing for non-timed urine samples in use at Bronson are listed below.

- Urine Albumin/Creatinine Ratio (Epic LAB689): This test detects albumin down to 0.3 mg/dl. It is the most sensitive test for detection of proteinuria.
- Urine Protein/Creatinine Ratio (Epic LAB743): This test detects albumin and other proteins down to 4 mg/dl. This test is useful for conditions with non-albumin proteins (such as immunoglobulins).
- Routine Urinalysis (Epic LAB348): The urine protein dipstick method primarily measures albumin with a detection level between 15 & 30 mg/dl. Other proteins become detectable at 60 mg/dl. Because urine creatinine is not measured and no ratio is calculated, these test results are highly dependent upon the patient's hydration level and the concentration of urine sample.

References:

1) National Kidney Foundation https://www.kidney.org/kidneydisease/siemens_hcp_acr
2) National Institutes of Health - https://www.niddk.nih.gov/health-information/professionals/clinical-tools-patient-management/kidney-disease/identify-manage-patients/evaluate-ckd/assess-urine-albumin
3) Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney inter., Suppl. 2013; 3: 1–150, section 1.4.4*: Evaluation of albuminuria* https://kdigo.org/wp-content/uploads/2017/02/KDIGO_2012_CKD_GL.pdf

Change in Free T3 Reference Range

Effective 1/5/22, the reference range for Free T3 will change from 2.56-4.43 pg/ml to 2.00 to 4.40 pg/ml. This change is being made after physician inquiry and a review of the most recent literature from the test manufacturer (Roche) followed by an evaluation of our patient population test data.

As a reminder, Free and/or Total T3 levels are not appropriate in screening patients for thyroid dysfunction or for monitoring patients on thyroid hormone. This recommendation is from the Choosing Wisely campaign which guides appropriate test utilization to help lower unnecessary healthcare costs. For monitoring patients with primary hypothyroidism on any form of thyroid hormone, free hormones may be misleading and more so reflect the timing of the patient's last dose versus TSH which provides information on the patient's thyroid status over the past several weeks. Likewise, the Thyroid Function Cascade (Epic LAB2346) is not indicated for following patients on thyroid hormone as it reflexes to unnecessary tests and adds to healthcare costs. The Thyroid Function Cascade can be used for screening for thyroid dysfunction but in patients on treatment for primary hypothyroidism TSH alone is most appropriate.

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Revision to Alkaline Phosphatase Normal Range

Effective 1/5/22, the reference range for Alkaline Phosphatase will change as shown below. This change is being made after a review of the most recent literature from the test manufacturer (Roche), other regional laboratories and an evaluation of our patient population test data. The new range has gender and additional age based values.

Old:

Male & Female	Range (U/L)
0-14 years	117-390
>14 years	29-114

New:

Male & Female	Range (U/L)
0-14 day	83-248
15 day - <1 years	122-469
1 - <10 years	142-335
10 - <13 years	129-417
Male	
13 - <15 years	116-468
15 - <17 years	82-331
17- <19 years	55-149
>=19 years	40-129
Female	
13 - <15 years	57-254
15 - <17 years	50-117
>=17 years	35-104

Please direct any questions you may have on these changes to Paul Guthrie MLS (ASCP), Clinical Technical Specialist guthriep@bronsonghg.org

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C. difficile Testing 2-Step Algorithm Update – *Effective 12/13/21*

There is growing evidence that PCR-only testing over-diagnoses C. difficile infection. A C diff 2-step algorithm helps improve patient care and safety. Bronson Lab C. difficile testing algorithm will now include C. difficile Toxin A/B Antigen Assay. The algorithm update will help providers distinguish between colonization and true C. difficile infections.

Samples must continue to meet laboratory criteria (liquid stool).

- Step 1: PCR. This assay tests for the presence of C. difficile bacteria that carry the gene for C. diff toxin.
  - C Diff PCR has high negative predictive value. If the PCR is negative, no additional testing is done; CDI treatment is not indicated.
  - C. diff PCR positive samples will automatically reflex to the new confirmatory Toxin Assay (Step 2).
- Step 2: Toxin EIA. This assay tests for C. difficile toxin A and B.
  - PCR positive/ Toxin Positive stool samples confirm C. difficile infection.
  - PCR positive/ Toxin Negative stool samples suggest C. difficile colonization; correlation with clinical signs and symptoms and exclusion of alternate causes of diarrhea is needed. If strong clinical suspicion of C. difficile infection persists, may treat for C. difficile infection and consider ID consultation
  - Reflex testing adds less than one hour to complete result reporting.

Algorithm Result Interpretation:

PCR Negative: Negative for C. difficile toxin gen (tcdB).

- The negative predictive value of this test for ruling out C. difficile disease associated diarrhea approaches 99%.

PCR Positive: Screening test is positive for C. difficile toxin gene (tcdB).

- Refer to confirmation toxin assay for final interpretation.

PCR and Toxin Positive: Screening and confirmatory test positive for C. difficile DNA and Toxin A/B.

- Indicative of C. diff disease associated diarrhea.

PCR Positive and Toxin Negative: Confirmatory test is negative for C. difficile Toxin A/B.

- PCR positive C. difficile DNA in absence of Toxin A/B may represent colonization or levels of toxin that are below the limit of detection of this assay.
- Strongly recommend correlating results with patient signs and symptoms before making a treatment decision.

Please direct any questions to Eric Parnell, Microbiology Supervisor, parnelle@bronsonhg.org

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