

Dear Laboratory user,

Re: Changes to biochemistry lab reporting with EPIC from 5th October 2023

We are writing to inform you that from **05/10/23**, the Synnovis Blood Sciences Laboratories at Denmark Hill (DH) will be making changes to some tests with the introduction of EPIC electronic health records system. In all cases no changes to the analytical methodology or UKAS accreditation will occur. These changes can be summarised thus:



The full list is available on www.synnovis.co.uk/kch. Alternatively, you can scan the QR code below.

New reference intervals.

Following an internal review of some of our reference intervals, the below tests will have the following changes.

Test	Current Reference Interval(s)	New Reference Interval(s)
Aspartate transaminase, AST (U/L)	10-77 (<2y) 8-43 (3-6y) 7-36 (7-13y) 3-35 (14-18y) 5-38 (19y+ PRUH) 10-50 (19y+ DH)	40-175 (<15d) 28-77 (15d-1y) 24-48 (1-7y) 20-42 (7-12y) 16-36 (12-19y M) 13-29 (12-19y F) 10-50 (19y+ M) 10-35 (19y+ F)
Alanine transaminase, ALT (U/L)	5-55	7-36 (<1y) 9-26 (1-13y) 9-33 (13-19y M) 7-25 (13-19y F) 10-50 (19y+ M) 10-35 (19y+ F)
Creatine Kinase, CK (U/L)	<150 (DH) 25-175 (M) (PRUH) 25-150 (F) (PRUH)	40-320 (M) 25-200 (F)
Conjugated bilirubin (DH only) (μmol/L)	0-4	<7
Transferrin Saturation (%)	15-56 (PRUH) 20-50 (DH)	20-45
Adjusted calcium (mmol/L)	2.15-2.60	2.20-2.60

New equations for three calculated tests

The below tests will be calculated using different formula to previous and so cannot be trended pre and post EPIC go live.

Test	Current formula	New formula
Estimated Glomerular Filtration Rate (eGFR)	4v MDRD (minus ethnicity)	CKD-EPI (2009) minus ethnicity
Adjusted calcium	Calcium (mmol/L) + ((42 – albumin [g/L])/50) (PRUH) Calcium (mmol/L) + 0.02(40 – albumin [g/L]) (DH)	Ca (mmol/L) - 0.016(Alb [g/L] - 45.8)
LDL cholesterol	Friedewald	Sampson NIH2

(i) **Change to eGFR calculation explained**

The NICE Chronic kidney disease: assessment and management [NG203] 2021 guidelines recommend the use of the CKD Epidemiology Collaboration creatinine (CKD-EPI) equation to estimate GFR. Until now we have used the 4 variable Modification of Diet in Renal Disease (MDRD) formula (without the ethnicity factor, which was removed from the calculation in November 2021). Several studies have shown that the MDRD equation systematically underestimates the GFR, particularly in low-risk patients with a high-normal serum creatinine level. This results in the labelling of some people with CKD who do not have significant kidney disease, particularly in the earlier stages of CKD.

As a result of this change in equation please be aware of the following:

- The new equation will more accurately assess eGFR, reducing the over-diagnosis of CKD in low-risk patients and improving diagnostic performance in patients aged over 80 years.
- Serum creatinine results are not affected by this change and will continue to be comparable over time. If the creatinine has not changed significantly, then true renal function will not usually have altered and any eGFR change can be attributed to the change in equation. Likewise, a change in creatinine that is significant could be masked by a seemingly stable eGFR.

(ii) **Change to adjusted calcium equation explained**

The new equation was derived using inpatient data obtained from DH & PRUH sites. This was following a position paper (2015) by The Association of Clinical Biochemistry which recommends that laboratories derive equations specific to their calcium and albumin methods and analytical platforms, rather than using literature-derived equations. The new equation is therefore based on our patient population and analytical methods currently used across KCH laboratories and aligns results across KCH sites. The new equation has a small (<0.1 mmol/L) positive bias compared to the previous ones in use but this equation verifies the upper reference interval of 2.60 mmol/L i.e. our data matches the reference interval.

(iii) **Change to calculated LDL equation explained**

LDL cholesterol has historically been calculated using the Friedewald equation, however, this has several limitations and is not valid in samples with triglycerides >4.5 mmol/L. The Sampson-National Institutes of Health 2 equation is more accurate than the Friedewald equation, particularly in patients with low LDL, and can also be used with triglycerides up to 9 mmol/L.

Change to HbA1c reporting

HbA1c results will no longer be accompanied by interpretative comments except for if the patient has an active pregnancy encounter in EPIC. Additionally, in the rare instances in which we are unable to report HbA1c result using our Roche c513 method, we will no longer be referring these samples for analysis by an alternative methodology. This is based on internal data which demonstrated that HbA1c is not indicated in these instances (e.g. patients with altered red cell turnover).

New tests available to order

Test
Fibrosis-4 (FIB-4) Index (calculation)

FIB-4 which uses age, AST, ALT, and platelet count is a non-invasive test for diagnosing advanced fibrosis in non-alcoholic fatty liver disease (NAFLD). It has been developed to assess the risk of cirrhosis in people with hepatitis C and non-alcoholic steatohepatitis (NASH).

Changes to critical phoning limits with EPIC.

The full list is available at www.synnovis.co.uk/kch.

Test	Current phone limit	New phone limit
Adjusted calcium (mmol/L)	≤ 1.80 & ≥ 3.00	≤ 1.80 & ≥ 3.40
AST (U/L)	≥ 1155 (0-2y) ≥ 645 (3-6y) ≥ 540 (7-13y) ≥ 525 (14-18y) ≥ 750 (19y+ DH) ≥ 570 (19y+ PRUH)	≥ 500 (<19y) ≥ 525 (19y+ F) ≥ 750 (19y+ M)
ALT (U/L)	≥ 825	≥ 500 (<19y) ≥ 525 (19y+ F) ≥ 750 (19y+ M)

Should you have questions related to these changes please do not hesitate to contact us.

Yours faithfully,



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